



UNIVERSITÀ
DEGLI STUDI
DI TORINO

041025

BROCHURE DEI CORSI



Dottorato in Informatica



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Docenti:	
Contatti docente:	
Anno:	
Tipologia:	
Crediti/Valenza:	
SSD attività didattica:	
Erogazione:	
Lingua:	
Frequenza:	
Tipologia esame:	

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=9pyw

Alignment issues in parallel multilingual treebanks: a case study

Anno accademico:	2012/2013
Codice attività didattica:	SEM-ALIGNISSUES
Docenti:	
Contatti docente:	
Anno:	1° anno 2° anno 3° anno
Tipologia:	Seminario
Crediti/Valenza:	0
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Italiano
Frequenza:	Facoltativa
Tipologia esame:	Non prevista

OBIETTIVI FORMATIVI

The usefulness of parallel corpora in translation studies and machine translation is strictly related to the availability of aligned data. We discuss the issues related to the design of a tool for the alignment of data from a parallel treebank, which takes into account syntactic knowledge as annotated in this kind of resource. A preliminary analysis is presented which is based on a case study, a parallel treebank for Italian, English and French, i.e. ParTUT. We will focus, in particular, on the study of translational divergences and their implications for the development of an alignment tool of parallel parse trees that, benefitting from the linguistic information provided in ParTUT, could properly deal with such divergences.

NOTA

Seminar held by Manuela Sanguinetti, PhD Student.

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=0d4e

Alternative Computing Paradigms: reversible and quantum

Alternative Computing Paradigms: reversible and quantum

Anno accademico:	2017/2018
Codice attività didattica:	INF0087-2
Docente:	Prof. Luca Luigi Paolini (Titolare del corso)
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Anno:	1° anno 2° anno 3° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	4
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	
Tipologia esame:	

PROGRAMMA

Mathematicians have studied algorithms and computation since ancient times, but the study of computability has not been systematically handled until the last century. A computing theory is a meta-mathematical description of the pervasive notion of calculus, i.e. of the notion of "mechanical manipulation of symbols".

The more successfully notion of computation is the classical one that borrows its main ingredients from the classical mechanics. However, physics has developed alternative models of mechanics (sometimes with limited aims) including probabilistic, reversible and quantum mechanics. All them suggest alternative models of computation.

Probabilistic computing is a non-deterministic model of computing. In it, computations evolve randomly and produce stochastic (according to some probability distribution) results. This kind of models is profitable when we look to problems looking for approximated solutions.

Reversible computing, in a general sense, means computing using reversible operations, that is, operations that can be easily and exactly reversed, or undone. When this kind of reversibility is maintained at the lowest level, in the physical mechanisms of operation of our bit-devices (such as transistors), it avoids dissipating the energy that is associated with the bits of information that are being manipulated. This can help to reduce the overall energy dissipation of computations, which can in turn increase battery life or processing speed in heat-limited systems.

Quantum computing is frontier research. The successful construction of a large-scale quantum computer may be some years away but, secure communication involving quantum cryptography has already been implemented. The amount of theoretical research and experimental developments in quantum computing grows rapidly. At the same time, interest grows within the science and technology community, especially in physics and theoretical computing.

TESTI CONSIGLIATI E BIBLIOGRAFIA

- Introduction to Reversible Computing, Kalyan S. Perumalla
- Quantum Computing for Computer Scientists, Noson S. Yanofsky and Mirco A. Mannucci
- Computing with Cells and Atoms, Cris Calude and Gheorghe Paun

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=rwqx

Alternative Computing Paradigms: reversible and quantum

Alternative Computing Paradigms: reversible and quantum

Anno accademico:	2016/2017
Codice attività didattica:	INF0087
Docente:	Prof. Luca Luigi Paolini (Titolare del corso)
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Anno:	1° anno 2° anno 3° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	
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PROGRAMMA

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- Quantum Computing for Computer Scientists, Noson S. Yanofsky and Mirco A. Mannucci
- Computing with Cells and Atoms, Cris Calude and Gheorghe Paun

Pagina web del corso: <http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show? id=6vyg>

Alternative Computing Paradigms: reversible and quantum

Alternative Computing Paradigms: reversible and quantum

Anno accademico:	2015/2016
Codice attività didattica:	ACP1415
Docente:	Prof. Luca Luigi Paolini (Titolare del corso)
Contatti docente:	+39 011 6706826, SIA_luca.paolini@unito.it CHE_paolini@di.unito.it VANNO_BENE .
Anno:	1° anno 2° anno 3° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	2
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Italiano
Frequenza:	Obbligatoria
Tipologia esame:	Orale

OBIETTIVI FORMATIVI

Mathematicians have studied algorithms and computation since ancient times, but the study of computability has not been systematically handled until the last century. A computing theory is a meta-mathematical description of the pervasive notion of calculus, i.e. of the notion of "mechanical manipulation of symbols".

The more successfully notion of computation is the classical one that borrows its main ingredients from the classical mechanics. However, physics has developed alternative models of mechanics (sometimes with limited aims) including probabilistic, reversible and quantum mechanics. All them suggest alternative models of computation.

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MODALITÀ DI VERIFICA DELL'APPRENDIMENTO

Seminario su argomento a scelta dello studente.

PROGRAMMA

- Classical Turing Machines and boolean circuits: revival and main results.
- Reversible Turing Machines and reversible circuits: introduction and main properties.
- Probabilistic Turing Machines and probabilistic circuits: introduction and main properties.
- Complex numbers and Hilbert's spaces: introduction to quantum computing.

- Quantum Turing Machines and quantum circuits: quantum registers, no-cloning theorem, observation, teleportation.

TESTI CONSIGLIATI E BIBLIOGRAFIA

Il materiale del corso sarà fornito durante le lezioni. Nel seguito sono solo indicate alcune letture correlate che dovrebbero aiutare a individuare il contenuto del corso. LE NOTE del DOCENTE copriranno tutto quanto trattato nel corso (vedi classico.pdf , reversible.pdf , quantum.pdf).

BOOKS:

- Introduction to Reversible Computing, Kalyan S. Perumalla
- Quantum Computing for Computer Scientists, Noson S. Yanofsky and Mirco A. Mannucci
- Computing with cells and atoms, Cristian S. Calude, Gheorghe Paun
- Foundations of Quantum Programming. Mingsheng Ying.
- Higher-Order Computability. Longley John and Normann Dag

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=qpp8

Analysis of mobility data to study and optimise public transports

Analysis of mobility data to study and optimise public transports

Anno accademico:	2013/2014
Codice attività didattica:	SEM-AMBSOPT
Docente:	
Contatti docente:	
Anno:	
Tipologia:	Seminario
Crediti/Valenza:	
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	Facoltativa
Tipologia esame:	Non prevista

PROGRAMMA

As the world becomes more urbanized, cities have evolved into one of our most consummate and complex artifacts. As a result, urban transportation is facing a grand challenge that is often called sustainable mobility: devising more efficient and adaptive urban transportation systems necessary to accommodate urban dynamics while preserving and restoring the environment. The general consensus is that congestion reduction is instead better addressed through Intelligent Transportation Systems (ITS) that leverage sensor networks, communications and computing technologies to manage existing infrastructure and transportation systems more efficiently. More recently, our growing reliance on smartphones and other pervasive technologies is producing a wealth of digital information extremely valuable to ITS systems because of its unprecedented level of spatio-temporal details about many aspects of our daily lives and in particular our travelling patterns. It also provides a medium through which it is possible to reach-out to the travellers and engage them in adopting the most efficient means of transport. In particular, in this seminar we present the analysis of mobile phone traces to optimise the public transports in developing countries.

NOTA

The seminar will be held by

Dr. Fabio Pinelli, IBM Researcher - Ireland **SHORT BIO:** Fabio Pinelli is currently a research scientist at Smarter City Technology Center at IBM research -- Ireland where he investigates new methods to extract useful knowledge from urban related data with special focus on Intelligent Transportation systems. He earned his PhD in Information Engineering from the University of Pisa where he studied new approaches for the analysis of trajectories of moving objects. During this period, he was also visiting student at Senseable City Lab -- M.I.T. His main research interests include spatio-temporal data mining, pervasive computing, intelligent transportation systems and urban dynamics.

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=kcir

ATLAS Project

Anno accademico:	2012/2013
Codice attività didattica:	SEM-ATLAS
Docente:	
Contatti docente:	
Anno:	1° anno 2° anno 3° anno
Tipologia:	Seminario
Crediti/Valenza:	0
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Italiano
Frequenza:	Facoltativa
Tipologia esame:	Non prevista

OBIETTIVI FORMATIVI

Seminari CIRMA 2012 *** Focus sui progetti ***

Paolo Prinetto - Gabriele Tiotto - Alessandro Mazzei - Fabrizio Nunnari --> ATLAS

Il progetto ATLAS si prefigge lo scopo di costruire un sistema computazionale per la traduzione automatica dall'Italiano verso la Lingua Italiana dei Segni (LIS). Alcuni fattori rendono l'obiettivo del progetto estremamente ambizioso. In primo luogo, solo a partire dagli anni '60 la comunità scientifica ha riconosciuto che le lingue dei segni sono delle lingue naturali, dotate di un proprio lessico e di una propria morfologia e sintassi. Di conseguenza, esistono pochissimi studi linguistici sulla LIS. In seconda istanza, a differenza dalle lingue vocali, le lingue dei segni usano in maniera funzionale lo spazio, così come una serie di fattori non manuali (sguardo, posizione del torso, sopracciglia). Infine, non esiste una maniera universalmente riconosciuta per "scrivere" una frase LIS. Nel seminario si presenteranno i risultati ottenuti da alcuni gruppi di ricerca partecipanti al progetto ATLAS. In particolare gli interventi si focalizzeranno su tre aspetti chiave del progetto, ovvero l'ideazione e la realizzazione di un lessico computazionale, di un sistema di traduzione basato su regole, di un attore virtuale per la sintesi finale dei segni.

NOTA

13 Giugno 2012 Palazzo Nuovo Lab MM G. Quazza - Auditorium h. 10 - 13

Pagina web del corso: <http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show? id=dc04>

Author profiling: Identification of age and gender (but also of personality and native language)

Author profiling: Identification of age and gender (but also of personality and native language)

Anno accademico:	2014/2015
Codice attività didattica:	SEM-APIAG
Docente:	
Contatti docente:	
Anno:	
Tipologia:	Seminario
Crediti/Valenza:	
SSD attività didattica:	
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	Facoltativa
Tipologia esame:	Non prevista

PROGRAMMA

ABSTRACT

Given a document, what are the author's traits? Is it possible to predict an author's demographics from her writing? May an author's style reveal her age and gender? Her personality? Her native language? Author profiling is the task that distinguishes between classes of authors studying their sociolect aspect, that is, how language is shared by people. This helps in identifying profiling aspects such as gender, age, native language, or personality type. In this talk I will also address the impact of emotions on author profiling. For instance, modelling the way people use emotions could help in tasks such as detection on online pedophiles. At the end, I will give an overview of the author profiling state-of-the-art systems that participated in shared tasks such as the one organised at PAN:
<http://pan.webis.de/>

NOTA

The seminar will be held by

Prof. Paolo Rosso

<http://users.dsic.upv.es/~prossor/>

Universitat Politècnica de València, Spain

Pagina web del corso: <http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show? id=63js>

Bigdata and NoSQL databases

Bigdata and NoSQL databases

Anno accademico:	2016/2017
Codice attività didattica:	INF0082
Docente:	Prof. Rosa Meo (Titolare del corso)
Contatti docente:	+39 011 670 68 17, meo@di.unito.it
Anno:	1° anno 2° anno 3° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	Obbligatoria
Tipologia esame:	

OBIETTIVI FORMATIVI

Overview of the NoSQL databases movement.

Knowledge of polyglot persistence and ability to choose the right database for the different needs.

RISULTATI DELL'APPRENDIMENTO ATTESI

Knowledge of the various typologies of data representations in the NoSql database movement.

Ability to design patterns for representation, querying and management of data in NoSql databases.

MODALITA' DI INSEGNAMENTO

Teaching with slides, examples and exercises.

MODALITÀ DI VERIFICA DELL'APPRENDIMENTO

Submission and correction of exercises on practical cases to be solved individually or in groups.

PROGRAMMA

Overview of BigData

A change of paradigm in data elaboration

Data distribution and limits to data consistency, availability, partitioning

An overview of NoSQL databases

Riak: a database for the web, based on key-values

HBase: a column-oriented database

MongoDB: a document-oriented database, based on JSON

Neo4J: a graph-oriented database

Experiments on modelling data and computing statistics with database of choice

TESTI CONSIGLIATI E BIBLIOGRAFIA

Seven databases in seven weeks A Guide to Modern Databases and the NoSQL Movement

Autore: Eric Redmond and Jim R. Wilson

Casa editrice: The pragmatic programmer

ISBN: 978-1-93435-692-0

Url: <https://pragprog.com/book/rwdata/seven-databases-in-seven-weeks>

MapReduce Design Patterns Building Effective Algorithms and Analytics for Hadoop and Other Systems

Autore: Donald Miner, Adam Shook Edizione: Final Release Date: November 2012

Casa editrice: O'Reilly Media

ISBN: 978-1-4493-2717-0

Url: <http://shop.oreilly.com/product/0636920025122.do>

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=dwf3

Bigdata and NoSQL databases

Bigdata and NoSQL databases

Anno accademico:	2017/2018
Codice attività didattica:	INF0082-2
Docente:	Prof. Rosa Meo (Titolare del corso)
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Anno:	1° anno 2° anno 3° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	Obbligatoria
Tipologia esame:	

PROGRAMMA

Overview of BigData

A change of paradigm in data elaboration

Data distribution and limits to data consistency, availability, partitioning

An overview of NoSQL databases

Riak: a database for the web, based on key-values

HBase: a column-oriented database

MongoDB: a document-oriented database, based on JSON

Neo4J: a graph-oriented database Experiments on modelling data and computing statistics with database of choice

Pagina web del corso: <http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show? id=v65v>

CADMOS Project

Anno accademico:	2012/2013
Codice attività didattica:	SEM-CIRMA
Docente:	
Contatti docente:	
Anno:	1° anno 2° anno 3° anno
Tipologia:	Seminario
Crediti/Valenza:	0
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Italiano
Frequenza:	Facoltativa
Tipologia esame:	Non prevista

OBIETTIVI FORMATIVI

L'efficacia dei motori di ricerca e il ri-uso di oggetti mediali (come file di testo, audio, video, applicazioni interattive, ...) dipende da un processo di annotazione (o tagging), mediante parole chiave libere o strutturate. I media "drammatici", che presentano personaggi in azione, non vengono annotati tipicamente con le qualità narrative o drammatiche. Esiste quindi un "divario semantico" (semantic gap) tra gli aspetti rappresentati e le informazioni associate.

Il seminario illustrerà gli scopi e i metodi del progetto CADMOS (Character-centred Annotation of Dramatic Media Objects, <http://www.cadmos-project.org>), che ha come obiettivo l'annotazione semantica delle caratteristiche "drammatiche" di un oggetto mediale (tipicamente un audiovisivo) e l'utilizzo dell'annotazione in contesti produttivi.

Il seminario farà seguito alla conferenza "Creatività digitale, un motore per l'innovazione" presso il Digital Experience Festival, h. 9.30, in cui CADMOS è discusso come caso di successo.

NOTA

30 Maggio 2012

Digital Experience Festival 2012

Officine Grandi Riparazioni ->>>>> Sala Cavour<<<<<

h. 11.30-13.00

a seguito di:

“Creatività digitale, un motore per l'innovazione”

Officine Grandi Riparazioni - Sala Duomo

h. 9.30-11.30

<http://digitalfestival.net/creativita-digitale-un-motore-per-linnovazione>

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=4cd3

Complexity of the Mints hierarchy in first-order intuitionistic logic

Complexity of the Mints hierarchy in first-order intuitionistic logic

Anno accademico:	2013/2014
Codice attività didattica:	SEM-CMHFOIL
Docente:	
Contatti docente:	
Anno:	
Tipologia:	Seminario
Crediti/Valenza:	
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	Facoltativa
Tipologia esame:	Non prevista

PROGRAMMA

In classical logic, every first-order formula is equivalent to one in prenex normal form. Intuitionistic logic does not have this property but it can be stratified on the basis of the quantifier prefix a formula *would have* if classically normalized. In the minimal (universally-implicational) fragment, this corresponds to alternation of positive and negative occurrences of the universal quantifier. This idea is implicit in a 1968 paper of G. Mints.

We investigate the decidability and complexity of the decision problems for classes of this hierarchy. The talk will be based on joint work with A. Schubert, D. Walukiewicz-Chrzaszcz, and K. Zdanowski.

NOTA

The seminar will be held by Prof. Pawel Urzyczyn, Varsavia University.

Pagina web del corso: <http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show? id=6w5f>

Composition Synthesis based on Combinatory Logic with Intersection Types

Anno accademico:	2013/2014
Codice attività didattica:	SEM-COMSYN
Docente:	
Contatti docente:	
Anno:	1° anno 2° anno 3° anno
Tipologia:	Seminario
Crediti/Valenza:	0
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	Facoltativa
Tipologia esame:	Non prevista

OBIETTIVI FORMATIVI

Composition synthesis is the problem of constructing a functional composition satisfying a goal specification from a given collection (library, repository) of functions or components. Combinatory logic synthesis is an approach to composition synthesis based on systems of combinatory logic with intersection types. The synthesis problem is formalized as the question of inhabitation in a combinatory logic. Intersection types play a central role in the combinatory synthesis paradigm, because they can be used to specify interesting semantic properties. In the talk we will give an overview of the theory and practice of combinatory logic synthesis and point out directions for future work.

NOTA

The course will be held by

Boris Döder, Moritz Martens e Jakob Rehof

Technical University of Dortmund

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=z76l

Confluence in sequent setting

Confluence in sequent setting

Anno accademico:	2014/2015
Codice attività didattica:	SEM-CSS
Docente:	
Contatti docente:	
Anno:	1° anno 2° anno 3° anno
Tipologia:	Seminario
Crediti/Valenza:	
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	Facoltativa
Tipologia esame:	Non prevista

PROGRAMMA

We consider an untyped intuitionistic sequent term calculus which is non-confluent.

The confluence is regained by imposing restrictions on the reduction rules, which eliminate the critical pair. In this way two subcalculi, the call-by-name and the call-by-value variant are obtained. We prove the confluence of the two proposed subcalculi by adapting Takahashi's parallel reductions technique for proving confluence of lambda calculus.

This is a refinement of the standard Tait and Martin-Lof's proof of the confluence of beta-eta reduction in the lambda calculus.

We analyse the granularity of reduction rules and then define a new notion of parallel reductions in this framework. We then prove the diamond property, which yields the proof of confluence for type free call-by-value sequent calculus.

Finally, we show that the diamond property of the new parallel reduction is also applicable to the call-by-name case. Confluence of a sequent lambda calculus is usually proved by embedding it in a calculus already known to be confluent.

We have developed a direct proof of confluence of two sequent subcalculi.

NOTA

The seminar will be hold by

Silvia Ghilezan (University of Novi Sad, Serbia)

Pagina web del corso: <http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show? id=66ar>

Connector Synthesis in Combinatory Logic

Connector Synthesis in Combinatory Logic

Anno accademico:	2013/2014
Codice attività didattica:	SEM-CSCL
Docente:	
Contatti docente:	
Anno:	
Tipologia:	Seminario
Crediti/Valenza:	
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	Facoltativa
Tipologia esame:	Non prevista

PROGRAMMA

Combinatory Logic Synthesis is a new type-based approach towards automatic synthesis of software from components in a repository. The method is based on inhabitation in combinatory logic with intersection types. In this talk it is shown how the type-based approach can naturally be used to exploit taxonomic conceptual structures in architectures and repositories to enable automatic composition, configuration and code generation, by associating taxonomic concepts to architectural building blocks such as, e.g., connectors. A central optimization strategy for solving the inhabitation problem, which has been implemented in our composition framework, will also be discussed.

NOTA

The seminar will be held by Dr. Boris Duedder, University of Dortmund.

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=xog5

Context-Aware Access Control for RDF Graph Stores

Anno accademico:	2012/2013
Codice attività didattica:	SEM-AACRDFGS
Docente:	
Contatti docente:	
Anno:	1° anno 2° anno 3° anno
Tipologia:	Seminario
Crediti/Valenza:	0
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	Facoltativa
Tipologia esame:	Non prevista

OBIETTIVI FORMATIVI

Serena Villata (INRIA Sophia Antipolis)

ABSTRACT:

To encourage data providers to publish a maximum of data on the Web, we propose SHI3LD, a mechanism to define lightweight access control policies for graph stores. Influenced by the steep growth of the mobile web, our Linked Data access control framework features context-aware control policies. SHI3LD is exclusively grounded on standard Semantic Web languages. The framework architecture is designed as a pluggable filter for generic SPARQL endpoints, and it has been evaluated on a test dataset.

Pagina web del corso: <http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show? id=8843>

Data Fusion for Smarter Cities

Anno accademico:	2012/2013
Codice attività didattica:	SEM-DFSMARTCITIES
Docente:	
Contatti docente:	
Anno:	1° anno 2° anno 3° anno
Tipologia:	Seminario
Crediti/Valenza:	0
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Italiano
Frequenza:	Facoltativa
Tipologia esame:	Non prevista

OBIETTIVI FORMATIVI

In this seminar I will present the work that I am doing at IBM Research Ireland lab 1 , and give an overview of the major research topics in the lab.

In the first part of the seminar, I will present queriocity, a platform for querying integrated representations of heterogeneous city data. Queriocity supports cataloging, exploring, integrating, processing, and transforming urban information. Such information comes from the Web, government authorities, social networks, data streams and Linked Data sources. The ultimate goal of queriocity is to simplify access to the huge data spaces originating from urban environments, and to make it easier to find and extract (aggregated) datasets to feed complex analytics and machine learning tasks. We are experimenting queriocity with public and restricted data provided by Dublin (Ireland).

In the second part of the seminar, I will present our automated traffic diagnoser. Based on data extracted from queriocity, our system produces quasi real-time automated explanations of traffic congestions. We combine reasoning over semantic representations of historical data (such as traffic congestions data) with an AI diagnosis approach. We are testing an initial implementation of the system with real data, and we are planning a trial with Dublin city.

ATTIVITÀ DI SUPPORTO

The seminar will be held by

Marco Luca Sbodio

IBM Ireland Research Lab

SHORT BIO:

I am a Research Software Engineer 3 working at IBM Ireland Research Lab. I am part of the City Fabric team in the Smarter Cities Technology Centre.

I work on automatic techniques for integrating massive semi-structured data and for recovering their semantics. I am interested in data fusion and management, and in making sense of the large amount of data available on the Web. A major goal in my work is to unlock unstructured and semi-structured data to enable querying, extraction, and complex analytics tasks.

My interests include Software Engineering, Artificial Intelligence (automated planning), Intelligent Agents, Linked Data, Semantic Web and Privacy.

Prior to joining IBM Research I worked for Hewlett-Packard for 11 years. I have a PhD in Computer Science from Politecnico di Torino (Italy) and Universite de Technologie de Compiègne (France).

1 www.ibm.com/ie/research/

2 <http://www.dublinked.ie/datastore/datastore.php>

3 <http://researcher.ibm.com/person/ie-marco.sbodio>

PROGRAMMA

The seminar will be held at:

Dipartimento di Automatica e Informatica

Sala riunioni 3 (4 piano)

13 Novembre 2012, ore 11.45

Politecnico di Torino

Corso Duca degli Abruzzi, 24

Map:

<http://www.polito.it/php/mappa/?sigla=STRUT,D1010&lang=it>

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=b493

Data Mining, Analysis, and Visualization of Social Networks

Data Mining, Analysis, and Visualization of Social Networks

Anno accademico:	2016/2017
Codice attività didattica:	
Docente:	
Contatti docente:	
Anno:	
Tipologia:	Seminario
Crediti/Valenza:	
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	
Tipologia esame:	

PROGRAMMA

<https://bmtgoncalves.github.io/TorinoCourse/>

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=mp36

Deep Learning

Deep Learning

Anno accademico:	2017/2018
Codice attività didattica:	DP17
Docente:	Prof. Rossella Cancelliere (Titolare del corso)
Contatti docente:	0116706737, rossella.cancelliere@unito.it
Anno:	1° anno 2° anno 3° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	
Tipologia esame:	

PROGRAMMA

Deep Learning

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=gt7l

Denotational Semantics

Anno accademico:	2012/2013
Codice attività didattica:	SD2012
Docente:	Prof. Luca Luigi Paolini (Titolare del corso)
Contatti docente:	+39 011 6706826, SIA_luca.paolini@unito.it CHE_paolini@di.unito.it VANNO_BENE .
Anno:	1° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	2
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Italiano
Frequenza:	Obbligatoria
Tipologia esame:	Orale

OBIETTIVI FORMATIVI

La semantica denotazionale formalizza il significato dei linguaggi di programmazione e delle logiche costruttive individuando opportune entità matematiche adatte a descriverne i significati. L'obiettivo primario del corso è presentare le caratteristiche essenziali di tali strutture matematiche, precipuamente nella via indicata dai lavori di Christopher Strachey e Dana Scott, ma non solo.

PROGRAMMA

In linea di massima gli argomenti principali saranno:

- PCF come modello per la programmazione funzionale tipata.
- Il problema della "full abstraction": estensioni non sequenziali del linguaggio.
- Cenni ai modelli alla Heyting-Kolmogorov di una logica costruttiva.

NOTA

ORARIO DELLE LEZIONI

DATA	GIORNO	ORARIO	AULA
23/10	Martedì	16-18	Seminari
24/10	Mercoledì	16-18	Seminari
25/10	Giovedì	16-18	Seminari
29/10	Lunedì	16-18	Seminari
30/10	Martedì	16-18	Seminari
7/11	Mercoledì	16-18	Seminari
8/11	Giovedì	16-18	Seminari
19/11	Lunedì	16-18	Seminari
20/11	Martedì	16-18	Seminari
21/11	Mercoledì	16-18	Seminari

Pagina web del corso: <http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?id=0d40>

Developing Embedded Software to International Standards and On-board Vehicle Software Architectural Standardization

Anno accademico:	2013/2014
Codice attività didattica:	SSAS2013
Docente:	
Contatti docente:	
Anno:	1° anno 2° anno 3° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	0
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Italiano
Frequenza:	Facoltativa
Tipologia esame:	Orale

OBIETTIVI FORMATIVI

Italiano

L'insegnamento è finalizzato a introdurre la standardizzazione dei processi di Sviluppo Software e della Architettura Software nell'elettronica di bordo dei veicoli, enfatizzando l'importanza del contesto del business cui i Sistemi Software sono destinati.

Il corso, della durata di 20 ore, si articolerà in tre parti.

PRIMA PARTE: Standardizzazione dei processi di sviluppo software nell'elettronica di bordo dei veicoli (14 ore)

La prima parte fornisce una dettagliata descrizione del Software Engineering (S.E.) in ambito automotive:

- concetti essenziali
- International Standards Tailoring
- Obiettivi dei processi di S.E.
- Modelli di software Life-cycle e standard ISO/IEC 12207
- Tematica della sicurezza nell'attuale contesto automotive e conseguente impatto sulle tematiche di S.E.
- Approccio Model-based e identificazione dell'Automotive Sw Life Cycle

SECONDA PARTE: Descrizione dello scenario applicativo (4 ore)

Sessione demo con dimostrazione di Best Practices, tramite l'utilizzo del software Mathworks.

TERZA PARTE: Standardizzazione dell'Architettura Software nelle centraline elettroniche sui veicoli - Introduzione ad AUTOSAR (2 ore)

Presentazione dell'architettura software AUTOSAR, piattaforma per lo sviluppo di applicazioni veicolari.

English

The course is designed to introduce You to the important International Standards applicable to embedded Software development; familiarize You with the basic content of these standards providing their specific tailoring for the automotive domain.

The course, of the duration of 20 hours, will be articulated in three parts.

First Part: Software Development Processes Standardization for the automotive domain(14 hours)

The first part provides a detailed description of the Software Engineering (S.E.) in automotive domain:

- S.E. general principles
- International Standards Tailoring
- Software Engineering processes Objectives.
- Life-cycle software Development Models and ISO/IEC Standard 12207
- Functional Safety Concept (ISO 26262 "Road Vehicles – Functional Safety) in the current context automotive and consequent impact in the S.E. Processes.
- Model-based Approach Application and Efficient Automotive Sw Life Cycle Identification

Second part: Application Scenario Description (4 hours)

Demo Session for the Best Practices thorough the use of MathWorks Tools Chain.

Third Part: On-board Vehicle Software Architectural Standardization in the ECUs on board vehicle – AUTOSAR Introduction (two hours)

Note:

The course will be held indicatively in March 2013

Instructor:

Demetrio Cortese

IVECO

Product Engineering / Electrical, Electronic Systems

Embedded Software Manager

ATTIVITÀ DI SUPPORTO

The course will be held by:

Demetrio Cortese

Product Engineering / Electrical, Electronic Systems

Embedded Software manager

PROGRAMMA

Pre Work

§ Introduzione a MATLAB (ita, eng)

§ Introduzione a Simulink (ita, eng)

§ Introduzione a Stateflow (eng)

<http://www.mathworks.it/videos/model-based-design-with-matlab-and-simulink-69040.html>

Webinars

§ MATLAB: <http://www.mathworks.it/products/matlab/webinars.html?language=en>

§ Simulink: <http://www.mathworks.it/products/simulink/webinars.html?language=en>

NOTA

The course schedule follows:

Date	From-To	Where	Topic
April, 8	16.00-19.00	Sala SEMINARI	Lecture
April, 10	16.00-19.00	Sala RIUNIONI	Lecture
April, 15	16.00-19.00	Sala SEMINARI	Lecture
April, 17	16.00-19.00	Sala RIUNIONI	Lecture
April, 23	10.00-16.00	Sala SEMINARI	Introduction to Mathworks
May, 27	16.00-19.00	Sala SEMINARI	Lecture

The schedule for the introduction to Mathworks will be:

§ 10:00 – 11:00 Model-Based Design workflow

§ 11:00 – 11:30 Break

§ 11:30 – 12:45 Going in production with automatic code generation

§ 12:45 – 14:00 Lunch

§ 14:00 – 15:00 Formal methods for design and code verification

§ 15:00 – 16:00 Wrap up and questions

Mutuato da: 2

Pagina web del corso: <http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?id=1f5e>

Discussioni Tesi di Dottorato Marengo e Pomponiu

Anno accademico:	2012/2013
Codice attività didattica:	SEM-DOTT1
Docente:	
Contatti docente:	
Anno:	1° anno 2° anno 3° anno
Tipologia:	Seminario
Crediti/Valenza:	0
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Italiano
Frequenza:	Facoltativa
Tipologia esame:	Non prevista

OBIETTIVI FORMATIVI

ore 12-13: Elisa Marengo

Titolo: 2CL Protocols: Interaction Patterns Specification in Commitment Protocols.

Abstract: Commitment protocols have been deeply investigated in the context of multiagent systems (MAS) as a valuable way for specifying interaction and communication protocols. Commitments capture social relations among the interacting parties, expressing the engagement of a debtor towards a creditor agent, to do something or to achieve some condition of interest. By specifying only what agents are expected to do, rather than how they are expected to satisfy their commitments, this kind of specification is highly appreciated because it leaves great freedom of behaviour to agents. However, in many practical contexts there is the need of capturing some patterns that the interaction is desired to respect and that improve coordination. The contribution of this thesis goes in this direction, by presenting an extension of commitment protocols which allows one to express a set of desired patterns given as constraints among facts and commitments. Being the approach declarative, it still provide a high flexibility to agents. More in detail, the proposal is to explicitly account for a regulative component of the specification, capturing the set of constraints on the interaction, and a separate and decoupled constitutive specification defining the set of actions that can be performed. The advantages

of this decoupling is a greater modularity in the specification which entails an easier protocol design, re-use and extension. An operational semantics is also provided. It is obtained as extension of the commitment machine in such a way to consider the role of constraints in deciding which of the possible interactions can be considered as legal for the protocol.

The proposal is validated by modelling some real case studies and by showing the advantages of its adoption with respect to other proposals from the literature. In order to support the design and the analysis of protocol specifications, a tool offering different kinds of functionalities is presented. Among these, a prolog program allows for the generation of the labelled graph of the possible interactions, where labels are used to represent constraints or commitments violations.

ore 13-14: Victor Pomponiu

Titolo: The Use of Singular Value Decomposition in Information Hiding

Abstract: In recent years, the necessity to protect multimedia content from

illegal copying has been made more critical by the advent of digital technology.

A common and well-discussed solution to counter the unauthorized distribution of copyrighted contents is applied by means of digital watermarking. This term refers to specific information hiding techniques whose purpose is to embed secret information inside multimedia contents, such as images, video or audio streams.

The watermark, i.e., the signal added to digital media, can be detected and retrieved when necessary. In the specific field of content protection, the objective is to identify the media's owner by means of a specific user-related watermark.

In the last years the well-known numerical tool called Singular Value Decomposition (SVD) received much attention from the watermarking community. However, few of these schemes take into consideration another crucial constraint, the security, which guarantees the usability of the watermarking technology. This dissertation focuses on the security of digital watermarking applications that make use of SVD transform to convey the watermark information.

First, we analyze and quantify the security of the watermarking schemes based on SVD

that embed the watermark additively or through quantization. These schemes are insecure and cannot be used for applications that require ownership protection and authentication. This is due to the fact that the space where the watermark resides, i.e., the embedding space, can be estimated and the watermark removed or overwritten. To motivate our findings we devise two novel attacks that remove the watermark while minimizing the perceptual distortion.

To cope with these attacks we explore the use of the singular vectors for information hiding. In particular, the proposed watermarking algorithm, that outperforms previously proposed image watermarking methods, inserts the watermark by modifying the angles formed by the singular vectors.

NOTA

La commissione sarà formata da:

Prof.ssa Carla Simone (Università degli Studi di Milano-Bicocca)

Prof. Enrico Magli (Politecnico di Torino)

Dr. Paolo Torrioni (Università di Bologna)

Pagina web del corso: <http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show? id=c00a>

Disruptive Innovation

Disruptive Innovation

Anno accademico:	2015/2016
Codice attività didattica:	DISINN1415
Docente:	Paola Maria Pisano (Titolare del corso)
Contatti docente:	<i>paolamaria.pisano@unito.it</i>
Anno:	1° anno 2° anno 3° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	Facoltativa
Tipologia esame:	Non prevista

PROGRAMMA

Disruptive innovation 20 ORE: PHD COURSE-

"Non dobbiamo pensare a soluzioni prevedibili, ma a provocazioni irragionevoli"

DESCRIZIONE DEL CORSO

L'innovazione e la creazione di un business intorno ad essa sono tematiche sempre più importanti a livello aziendale sia a livello territoriale. L'Italia così come l'Europa puntano nel rilancio dell'economia attraverso l'innovazione e la creazione di start up. Corso è stato creato per condividere con i dottorandi un nuovo modo di creazione dell'innovazione attraverso il pensiero dirompente. Un pensiero dirompente è quell'idea che cambia completamente il tuo punto di vista su un prodotto. È l'intuizione che porta un'azienda a staccarsi dal gregge e a percorrere strade inedite.

Nella creazione dell'innovazione non è solo importante avere l'idea ma creare il prodotto o servizio esatto per il target di consumatori definito. Il prodotto o servizio innovativo deve essere visto come un esperimento che insegna all'innovatore cosa è apprezzato dal cliente finale. Eseguiti tutti gli esperimenti per la costruzione dell'innovazione l'imprenditore dovrà superare l'ultimo step ossia l'execution dell'innovazione.

All'interno del corso verranno inoltre fornite soft skill riguardanti la leadership, il teamworking e la comunicazione e metodologie alternative quali "il pensiero distruttivo", "il modello canvas", "la lean methodology" "l'utilizzo del design nella comunicazione e soluzione dei problemi", "il pensiero trasversale".

OBIETTIVO DEL CORSO :

Il corso ha l'obiettivo di fornire strumenti alternativi per la creazione dell'innovazione, la comunicazione e la diffusione della stessa al cliente finale.

VALUTAZIONE FINALE:

L'esame finale consiste nel creare un'innovazione all'interno della propria area di ricerca.

Ogni dottorando sarà abbinato ad un team di studenti del corso di innovazione del secondo anno al quale dovrà fare da project manager.

L'innovazione verrà infine presentata davanti a una giuria di professori e imprenditori.

PROGRAMMA:

Definizione dell'innovazione e differenti tipologie di innovazione (2 ORE)

- Perché l'innovazione è importante
- Cos'è l'innovazione
- Aspetti chiave dell'innovazione

Il pensiero distruttivo (4 ORE)

- Creazione di innovazioni radicali e incrementali
- Dall'idea all'implementazione : Lean methodology

La cultura all'interno dell'impresa (2 ORE)

- La cultura innovativa
- L'innovation leader
- La gestione del team

I business model dell'innovazione (4 ORE)

- il modello Canvas
- Long tail model/open organization

Business plan dell'innovazione (4ORE)

- Strutturare il business plan di un'innovazione

Comunicazione dell'innovazione (4 ORE)

- Il cliente al centro dell'innovazione: il lead user -definizione del mercato cliente e relazione con il cliente
- il disegno e la comunicazione
- Presentare un'innovazione

Bibliografia

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Cabrio Cautela C., Pisano P. , Pironti P., Rieple A. "From conceptualizing to ready-to-sell designing: creative networks and design entrepreneurship in a digital manufacturing era" DMI 2012 International Research conference 8 th-9 th August, Boston, Massachusetts isbn 978-0-615-66453-8, Design Management Institute 101 Temont St.Suite 300 Boston, MA USA 02108

DE Bono, E. (1990) Lateral Thinking: Creativity step by step, Harper colophon

Osterwalder, A.; Pigneur, Y; Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers Paperback

Jeanne Liedtka, Andrew King, Kevin Bennett, (2013) . Solving Problems with Design Thinking: Ten Stories of What Works, Columbia Business School publishing

Pisano Paola, Pironti Marco, Rieple Alison "Business Network Dynamics And Diffusion Of Innovation" XXXIII CONFERENZA ITALIANA DI SCIENZE REGIONALI, Roma, 13-15 Settembre 2012

Pisano P., "Managing innovation: creare, gestire e diffondere innovazione nei sistemi relazionali. Libreriauniversitaria.it Edizioni, 2010 ISBN 978-88-292-043-8

Pisano P., Pironti M, Christodoulou I, 2013"the open long tail model between new culture and Digital technology"Best paper Award Sinergie conference

Sola, D & Jerome Couturier, J (2013) How to think strategically your roadmap to innovation and resolution, FT publishing

NOTA

The course will be held in March.

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=zbd2

Disruptive Innovation

Disruptive Innovation

Anno accademico:	2014/2015
Codice attività didattica:	DISINN2014
Docente:	Paola Maria Pisano (Titolare del corso)
Contatti docente:	<i>paolamaria.pisano@unito.it</i>
Anno:	1° anno 2° anno 3° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	Facoltativa
Tipologia esame:	Non prevista

PROGRAMMA

Disruptive innovation 20 ORE: PHD COURSE-

"Non dobbiamo pensare a soluzioni prevedibili, ma a provocazioni irragionevoli"

DESCRIZIONE DEL CORSO

L'innovazione e la creazione di un business intorno ad essa sono tematiche sempre più importanti a livello aziendale sia a livello territoriale. L'Italia così come l'Europa puntano nel rilancio dell'economia attraverso l'innovazione e la creazione di start up. Corso è stato creato per condividere con i dottorandi un nuovo modo di creazione dell'innovazione attraverso il pensiero dirompente. Un pensiero dirompente è quell'idea che cambia completamente il tuo punto di vista su un prodotto. È l'intuizione che porta un'azienda a staccarsi dal gregge e a percorrere strade inedite.

Nella creazione dell'innovazione non è solo importante avere l'idea ma creare il prodotto o servizio esatto per il target di consumatori definito. Il prodotto o servizio innovativo deve essere visto come un esperimento che insegna all'innovatore cosa è apprezzato dal cliente finale. Eseguiti tutti gli esperimenti per la costruzione dell'innovazione l'imprenditore dovrà superare l'ultimo step ossia l'execution dell'innovazione.

All'interno del corso verranno inoltre fornite soft skill riguardanti la leadership, il teamworking e la comunicazione e metodologie alternative quali "il pensiero distruttivo", "il modello canvas", "la lean methodology" "l'utilizzo del design nella comunicazione e soluzione dei problemi", "il pensiero trasversale".

OBIETTIVO DEL CORSO :

Il corso ha l'obiettivo di fornire strumenti alternativi per la creazione dell'innovazione, la comunicazione e la diffusione della stessa al cliente finale.

VALUTAZIONE FINALE:

L'esame finale consiste nel creare un'innovazione all'interno della propria area di ricerca.

Ogni dottorando sarà abbinato ad un team di studenti del corso di innovazione del secondo anno al quale dovrà fare da project manager.

L'innovazione verrà infine presentata davanti a una giuria di professori e imprenditori.

PROGRAMMA:

Definizione dell'innovazione e differenti tipologie di innovazione (2 ORE)

- Perché l'innovazione è importante
- Cos'è l'innovazione
- Aspetti chiave dell'innovazione

Il pensiero distruttivo (4 ORE)

- Creazione di innovazioni radicali e incrementali
- Dall'idea all'implementazione : Lean methodology

La cultura all'interno dell'impresa (2 ORE)

- La cultura innovativa
- L'innovation leader
- La gestione del team

I business model dell'innovazione (4 ORE)

- il modello Canvas
- Long tail model/open organization

Business plan dell'innovazione (4ORE)

- Strutturare il business plan di un'innovazione

Comunicazione dell'innovazione (4 ORE)

- Il cliente al centro dell'innovazione: il lead user -definizione del mercato cliente e relazione con il cliente
- il disegno e la comunicazione
- Presentare un'innovazione

Bibliografia

Christensen C., Curtis W. Johnson and Michael B. Horn, (2010): How Disruptive Innovation Will Change the Way the World Learns Disrupting Class, Expanded Edition

Cabrio Cautela C., Pisano P. , Pironti P., Rieple A. "From conceptualizing to ready-to-sell designing: creative networks and design entrepreneurship in a digital manufacturing era" DMI 2012 International Research conference 8 th-9 th August, Boston, Massachusetts isbn 978-0-615-66453-8, Design Management Institute 101 Temont St.Suite 300 Boston, MA USA 02108

DE Bono, E. (1990) Lateral Thinking: Creativity step by step, Harper colophon

Osterwalder, A.; Pigneur, Y; Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers Paperback

Jeanne Liedtka, Andrew King, Kevin Bennett, (2013) . Solving Problems with Design Thinking: Ten Stories of What Works, Columbia Business School publishing

Pisano Paola, Pironti Marco, Rieple Alison "Business Network Dynamics And Diffusion Of Innovation" XXXIII CONFERENZA ITALIANA DI SCIENZE REGIONALI, Roma, 13-15 Settembre 2012

Pisano P., "Managing innovation: creare, gestire e diffondere innovazione nei sistemi relazionali. Libreriauniversitaria.it Edizioni, 2010 ISBN 978-88-292-043-8

Pisano P., Pironti M, Christodoulou I, 2013"the open long tail model between new culture and Digital technology"Best paper Award Sinergie conference

Sola, D & Jerome Couturier, J (2013) How to think strategically your roadmap to innovation and resolution, FT publishing

NOTA

The course will be held in March.

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=kn7b

Emotion-oriented systems

Emotion-oriented systems

Anno accademico:	2017/2018
Codice attività didattica:	INF0088-2
Docente:	Dott. Cristina Bosco (Titolare del corso) Rossana Damiano (Titolare del corso) Viviana Patti (Titolare del corso)
Contatti docente:	0116706845, cristina.bosco@unito.it
Anno:	1° anno 2° anno 3° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	Obbligatoria
Tipologia esame:	Scritto

PROGRAMMA

- Introduction to the course: overview on emotion oriented systems (2h)
- Emotions: concepts, definitions and models: from psychological theories to computational models (4 h)
- Linguistic and semantic resources: datasets, sentiment lexicons (multilingualism), ontologies; collecting and labelling methodologies; available benchmarks and standards. (6h)
- Application I: Emotions in interaction: emotions in virtual agents; practical architectures for emotion generation and expression (4h)
- Application II: Emotion detection and sentiment analysis in social media: state-of-the-art methodologies, application domains (4h)

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=5gpb

Emotion-oriented systems

Emotion-oriented systems

Anno accademico:	2015/2016
Codice attività didattica:	EOS1415
Docente:	Viviana Patti (Titolare del corso) Rossana Damiano (Titolare del corso) Dott. Cristina Bosco (Titolare del corso)
Contatti docente:	0116706804, viviana.patti@unito.it
Anno:	1° anno 2° anno 3° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	2
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Italiano
Frequenza:	Obbligatoria
Tipologia esame:	Scritto

PROGRAMMA

- Introduction to the course: overview on emotion oriented systems (2h)
- Emotions: concepts, definitions and models: from psychological theories to computational models (4 h)
- Linguistic and semantic resources: datasets, sentiment lexicons (multilingualism), ontologies; collecting and labelling methodologies; available benchmarks and standards. (6h)
- Application I: Emotions in interaction: e motions in virtual agents; practical architectures for emotion generation and expression (4h)
- Application II: Emotion detection and sentiment analysis in social media: state-of-the-art methodologies, application domains (4h)

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=76ax

Emotion-oriented systems

Emotion-oriented systems

Anno accademico:	2016/2017
Codice attività didattica:	INF0088
Docente:	Dott. Cristina Bosco (Titolare del corso) Rossana Damiano (Titolare del corso) Viviana Patti (Titolare del corso)
Contatti docente:	0116706845, cristina.bosco@unito.it
Anno:	1° anno 2° anno 3° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	2
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	Obbligatoria
Tipologia esame:	Scritto

PROGRAMMA

- Introduction to the course: overview on emotion oriented systems (2h)
- Emotions: concepts, definitions and models: from psychological theories to computational models (4 h)
- Linguistic and semantic resources: datasets, sentiment lexicons (multilingualism), ontologies; collecting and labelling methodologies; available benchmarks and standards. (6h)
- Application I: Emotions in interaction: e motions in virtual agents; practical architectures for emotion generation and expression (4h)
- Application II: Emotion detection and sentiment analysis in social media: state-of-the-art methodologies, application domains (4h)

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=yjy3

Energy aware computer systems and networks

Energy aware computer systems and networks

Anno accademico:	2013/2014
Codice attività didattica:	SEM-EACSN
Docente:	
Contatti docente:	
Anno:	1° anno 2° anno 3° anno
Tipologia:	Seminario
Crediti/Valenza:	0
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	Facoltativa
Tipologia esame:	Non prevista

PROGRAMMA

For many decades we have ignored the energy costs of the development of information technology, and now we realise that this field consumes close to 5% of Europe's electrical energy. Thus this talk will discuss how energy and computer and network quality of service (QoS) are intertwined. We will show how trade-offs can be effected to attain minima of cost functions that combine these two factors.

Brief Bio: Erol Gelenbe FACM FIEEE studied at the Middle East Technical University in Ankara, Turkey, and has worked on the performance evaluation of computer systems and networks as well as on bio-networks. He holds "honoris causa" doctorates from the Universities of Roma II, Liege (Belgium) and Bogazici (Istanbul), and was elected to the French National Academy of Engineering, and the Academy of Sciences of Hungary, Poland and Turkey. His awards include the "In Memoriam Dennis Gabor Award" of the Hungarian Academy, the Institution for Engineering and Technology (UK) Oliver Lodge Medal, the ACM SIGMETRICS Life-Time Achievement Award, and the Grand Prix France Telecom of the French Science Academy (1996). He was appointed a Grande Ufficiale of the Star of Italy (2007), a Commendatore in the Order of Merit of Italy (2005), an Officer of Merit of France (2001), and a Chevalier des Palmes Academiques.

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=e8c7

Exact-Approximate Bayesian Inference for Gaussian Processes

Exact-Approximate Bayesian Inference for Gaussian Processes

Anno accademico:	2014/2015
Codice attività didattica:	SEM-ABIGP
Docente:	
Contatti docente:	
Anno:	1° anno 2° anno 3° anno
Tipologia:	Seminario
Crediti/Valenza:	
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	Facoltativa
Tipologia esame:	Non prevista

PROGRAMMA

Hierarchical models are commonly employed to model complex phenomena. The importance of achieving a sound quantification of uncertainty in predictions by characterizing the posterior distribution over all parameters exactly has been demonstrated in several applications. In this talk, I will focus on the Bayesian treatment of a class of hierarchical models involving Gaussian Processes (GP) using Markov chain Monte Carlo (MCMC) methods. After discussing why MCMC is the only way to infer all parameters exactly in GP models and pointing out the challenges in doing so, I will present the so called Exact-Approximate MCMC approach that offers a practical solution to this problem by overcoming the huge challenges associated with the exact computation of the intractable marginal likelihood of such models. In particular, the Exact-Approximate MCMC approach yields samples from the correct posterior distribution over model parameters, but only requires an unbiased estimate of the intractable marginal likelihood. I will finally present ways to construct unbiased estimates of the marginal likelihood in GP models, and conclude the talk by presenting results on several benchmark data sets and on a multi-class multiple-kernel classification problem on neuroimaging data.

NOTA

The seminar will be held by

Maurizio Filippone
School of Computing Science - University of Glasgow

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=olah

Foundational principles of reversible and quantum computing

Foundational principles of reversible and quantum computing

Anno accademico:	2014/2015
Codice attività didattica:	FPRQC2014
Docente:	Prof. Luca Luigi Paolini (Titolare del corso)
Contatti docente:	+39 011 6706826, SIA_luca.paolini@unito.it CHE_paolini@di.unito.it VANNO_BENE .
Anno:	1° anno 2° anno 3° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	2
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Italiano
Frequenza:	Obbligatoria
Tipologia esame:	Scritto

OBIETTIVI FORMATIVI

Mathematicians have studied algorithms and computation since ancient times, but the study of computability has not been systematically handled until the last century. A computing theory is a meta-mathematical description of the pervasive notion of calculus, i.e. of the notion of "mechanical manipulation of symbols".

The more successfully notion of computation is the classical one that borrows its main ingredients from the classical mechanics. However, physics has developed alternative models of mechanics (sometimes with limited aims) including probabilistic, reversible and quantum mechanics. All them suggest alternative models of computation.

Probabilistic computing is a non-deterministic model of computing. In it, computations evolve randomly and produce stochastic (according to some probability distribution) results. This kind of models is profitable when we look to problems looking for approximated solutions.

Reversible computing, in a general sense, means computing using reversible operations, that is, operations that can be easily and exactly reversed, or undone. When this kind of reversibility is maintained at the lowest level, in the physical mechanisms of operation of our bit-devices (such as transistors), it avoids dissipating the energy that is associated with the bits of information that are being manipulated. This can help to reduce the overall energy dissipation of computations, which can in turn increase battery life or processing speed in heat-limited systems.

Quantum computing is frontier research. The successful construction of a large-scale quantum computer may be some years away but, secure communication involving quantum cryptography has already been implemented. The amount of the oretical research and experimental developments in quantum computing grows rapidly. At the same time, interest grows within the science and technology community, especially in physics and theoretical computing.

PROGRAMMA

- Classical Turing Machines and boolean circuits: revival and main results.
- Reversible Turing Machines and reversible circuits: introduction and main properties.
- Probabilistic Turing Machines and probabilistic circuits: introduction and main properties.
- Complex numbers and Hilbert's spaces: introduction to quantum computing.
- Quantum Turing Machines and quantum circuits: quantum registers, no-cloning theorem, observation, teleportation.

TESTI CONSIGLIATI E BIBLIOGRAFIA

Il materiale del corso sarà fornito durante le lezioni. Nel seguito sono solo indicate alcune letture correlate che dovrebbero aiutare a individuare il contenuto del corso.

BOOKS:

- Introduction to Reversible Computing, Kalyan S. Perumalla
- Quantum Computing for Computer Scientists, Noson S. Yanofsky and Mirco A. Mannucci

Extra interesting reading

- Reversible Computing, Alexis De Vos.
- Quantum Computing, Jozef Gruska.
- Logical Reversibility of Computation, Charles H. Bennett.
- Notes on Landauer's Principle, Reversible Computation, and Maxwell's Demon, Charles H. Bennett.
- Reversible Computing, Tommaso Toffoli.
- A Syntax for Linear Logic, Philip Wadler.
- A Functional Quantum Programming Language, Jonathan J. Grattage.
- NREVERSAL of Fortune --- The Thermodynamics of Garbage Collection, Henry G. Baker.
- From Reversible to Irreversible Computations, Alexander S. Green and Thorsten Altenkirch.
- Using Forth in an Investigation into Reversible Computation, Bill Stoddart.
- Quantum Theory, the Church-Turing Principle, and the Universal Quantum Computer, David Deutsch.
- Quantum Lambda Calculus, Peter Selinger and Benoit Valiron.
- Reversible Communicating Concurrent Systems, Vincent Danos and Jean Krivine.
- General Reversibility, Vincent Danos, Jean Krivine, and Pawel Sobocinski.
- A Structural Approach to Reversible Computation, Samson Abramsky.
- Reversible Combinatory Logic, Alessandra Di Pierro, Chris Hankin, and Herbert Wiklicky.

NOTA

The course will be held in October/November.

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=uzq9

Foundational principles of reversible and quantum computing

Foundational principles of reversible and quantum computing

Anno accademico:	2013/2014
Codice attività didattica:	FPRQC2013
Docente:	Prof. Luca Luigi Paolini (Titolare del corso)
Contatti docente:	+39 011 6706826, SIA_luca.paolini@unito.it CHE_paolini@di.unito.it VANNO_BENE .
Anno:	1° anno 2° anno 3° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	2
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Italiano
Frequenza:	Obbligatoria
Tipologia esame:	Scritto

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PROGRAMMA

- Classical Turing Machines and boolean circuits: revival and main results.
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- Probabilistic Turing Machines and probabilistic circuits: introduction and main properties.
- Complex numbers and Hilbert's spaces: introduction to quantum computing.
- Quantum Turing Machines and quantum circuits: quantum registers, no-cloning theorem, observation, teleportation.

TESTI CONSIGLIATI E BIBLIOGRAFIA

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- Quantum Computing for Computer Scientists, Noson S. Yanofsky and Mirco A. Mannucci

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- A Functional Quantum Programming Language, Jonathan J. Grattage.
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- General Reversibility, Vincent Danos, Jean Krivine, and Pawel Sobocinski.
- A Structural Approach to Reversible Computation, Samson Abramsky.
- Reversible Combinatory Logic, Alessandra Di Pierro, Chris Hankin, and Herbert Wiklicky.

NOTA

ORARIO: DETTAGLI

- mar 15/10 (ore 16-18), sala riunioni
- gio 17/10 (ore 14-16), sala seminari
- ven 18/10 (ore 10-12), sala seminari

- mar 22/10 (ore 16-18), sala seminari
- gio 24/10 (ore 14-16), sala seminari
- ven 25/10 (ore 10-12), sala seminari

- mar 29/10 (ore 16-18), sala seminari
- gio 31/10 (ore 14-16), sala seminari
- ven 01/11 FESTA NAZIONALE

+1 o 2 lezioni si terranno nella settimana successiva
(ed eventuali lezioni da recuperare).

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=bea5

Foundations of communication-centred programming

Foundations of communication-centred programming

Anno accademico:	2016/2017
Codice attività didattica:	INF0084
Docente:	Prof. Mariangiola Dezani (Titolare del corso)
Contatti docente:	+390116706850, dezani@di.unito.it
Anno:	1° anno 2° anno 3° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	2
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Italiano
Frequenza:	Obbligatoria
Tipologia esame:	Scritto

PROGRAMMA

The service-oriented computing paradigm has emerged in response to a fundamental shift in the way enterprises conduct business.

The aim of this course is to discuss models of communication protocols assuring secure interactions of all participants.

A key concept is that of contract, namely specification of mutual behavioural constraints among communicating components to achieve some distinguished goals.

A contract is a discipline for delivering, discovering and interacting with web services. It includes both a description of service capabilities and constraints on their usage, as well as rights and duties of the client, preferences, entitlements and credentials. Moreover, a contract includes security requirements, such as confidentiality and integrity.

Pagina web del corso: <http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?id=w4t5>

Foundations of communication-centred programming

Anno accademico:	2014/2015
Codice attività didattica:	FCCP2014
Docente:	Prof. Mariangiola Dezani (Titolare del corso) Prof. Viviana Bono (Titolare del corso)
Contatti docente:	+390116706850, dezani@di.unito.it
Anno:	1° anno 2° anno 3° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	2
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Italiano
Frequenza:	Obbligatoria
Tipologia esame:	Scritto

OBIETTIVI FORMATIVI

The service-oriented computing paradigm has emerged in response to a fundamental shift in the way enterprises conduct business.

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A key concept is that of contract, namely specification of mutual behavioural constraints among communicating components to achieve some distinguished goals.

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Pagina web del corso: <http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show? id=lmii>

Foundations of communication-centred programming

Anno accademico:	2013/2014
Codice attività didattica:	FCCP2013
Docente:	Prof. Mariangiola Dezani (Titolare del corso) Prof. Viviana Bono (Titolare del corso)
Contatti docente:	+390116706850, dezani@di.unito.it
Anno:	1° anno 2° anno 3° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	2
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Italiano
Frequenza:	Obbligatoria
Tipologia esame:	Scritto

OBIETTIVI FORMATIVI

The service-oriented computing paradigm has emerged in response to a fundamental shift in the way enterprises conduct business.

The aim of this course is to discuss models of communication protocols assuring secure interactions of all participants.

A key concept is that of contract, namely specification of mutual behavioural constraints among communicating components to achieve some distinguished goals.

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Pagina web del corso: <http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show? id=3006>

Foundations of communication-centred programming

Anno accademico:	2012/2013
Codice attività didattica:	FCCP2012
Docente:	Prof. Viviana Bono (Titolare del corso) Prof. Mariangiola Dezani (Titolare del corso)
Contatti docente:	011/670 6733, <i>bono@di.unito.it</i>
Anno:	1° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	2
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Italiano
Frequenza:	Obbligatoria
Tipologia esame:	Orale

OBIETTIVI FORMATIVI

The service-oriented computing paradigm has emerged in response to a fundamental shift in the way enterprises conduct business.

The aim of this course is to discuss models of communication protocols assuring secure interactions of all participants.

A key concept is that of contract, namely specification of mutual behavioural constraints among communicating components to achieve some distinguished goals.

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Pagina web del corso: <http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show? id=9730>

Foundations of communication-centred programming

Anno accademico:	2011/2012
Codice attività didattica:	FCCP2011
Docente:	Prof. Viviana Bono (Titolare del corso) Prof. Mariangiola Dezani (Titolare del corso)
Contatti docente:	011/670 6733, bono@di.unito.it
Anno:	1° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	2
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Italiano
Frequenza:	Obbligatoria
Tipologia esame:	Orale

OBIETTIVI FORMATIVI

The service-oriented computing paradigm has emerged in response to a fundamental shift in the way enterprises conduct business.

The aim of this course is to discuss models of communication protocols assuring secure interactions of all participants.

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TESTI CONSIGLIATI E BIBLIOGRAFIA

Davide Sangiorgi *The pi-calculus: A Theory of Mobile Processes*

M. Dezani-Ciancaglini and U. de' Liguoro. *Sessions and Session Types: an Overview*, WS-FM'09, LNCS, volume 6194, pages 1-28, 2010, Springer. <http://www.di.unito.it/~dezani/papers/sto.pdf>

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=0fe8

Give Peace a Chance: HCI for Peace?

Anno accademico:	2013/2014
Codice attività didattica:	SEM-PEACE
Docente:	
Contatti docente:	
Anno:	1° anno 2° anno 3° anno
Tipologia:	Seminario
Crediti/Valenza:	0
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	Facoltativa
Tipologia esame:	Non prevista

OBIETTIVI FORMATIVI

ABSTRACT

Can computers bring peace? Not yet perhaps, but today computers are increasingly mediating the way people make decisions, including those that can have an effect on conflict and peace. Human-Computer Interaction researchers have more opportunities than ever to contribute to this ambitious goal.

In this talk, I briefly introduce a new community of researchers, part of the Special Interest Group of the Association of Computing Machinery on HCI, called HCI for Peace [Hourcade et al., 2013]. The main goal is to provide an international forum in which to discuss ideas on how the HCI community can play a role in preventing, de-escalating and recovering from conflict.

I then present a specific case of a collaborative system designed to support reconciliation of narratives of a conflict by means of a technology-enabled process aimed at encouraging the users to reconsider hostile attitudes towards another [Zancanaro et al., 2012]. The system is a tabletop interface that provides a setting for face-to-face shared narration and support for the management of disagreements. The interface supports escalation and de-escalation of the conflict emerging in the shared narration and requires that participants perform joint actions when a contribution to the story is to be removed from the overall narration. A between-subjects experiment compared the tabletop interface and a desktop multimedia interface with mixed pairs of Israeli-Jewish and Palestinian-Arab teenagers. The results demonstrated that the experience with the tabletop interface appears to be motivating and, most important, produce at least a short term shift of attitude toward the other.

PROGRAMMA

The course will be held by

Massimo Zancanaro

Fondazione Bruno Kessler (Trento)

NOTA

REFERENCES

Hourcade J.P., Busse D.K. , Nathan L., Kapros E., Thomas J.C., Zaphyris P., Zancanaro M. (2013) HCI for Peace Ideathon. In Proceedings of ACM CHI 2013: Changing Perspectives, Paris, France

Zancanaro M., Stock O., Eisikovits Z., Koren C., Weiss P.L. (2012) Co-narrating a Conflict: An Interactive Tabletop to Facilitate Attitudinal Shifts. ACM Transactions on Computer-Human Interaction, 19, 3.

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=dvss

Implementing Internal Domain-Specific Languages with Ruby: An Introduction

Implementing Internal Domain-Specific Languages with Ruby: An Introduction

Anno accademico:	2014/2015
Codice attività didattica:	SEM-IIDLRL
Docente:	
Contatti docente:	
Anno:	1° anno 2° anno 3° anno
Tipologia:	Seminario
Crediti/Valenza:	
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	Facoltativa
Tipologia esame:	Non prevista

PROGRAMMA

A domain-specific language (DSL) is a programming language whose goal is to ease the expression of solutions to problems within a particular domain of application. A DSL thus provides a high-level of abstraction and expressiveness within that particular domain. However, since a DSL is tied to a particular domain, it might not be as expressive (in the sense of "Turing-completeness") as a general purpose programming language (GPL).

In this talk, we will first present some examples of DSL along with some of their key characteristics. Then, we will briefly present the Ruby programming language, a highly expressive dynamic GPL with features that can ease the implementation of internal DSL, a type of DSL that does not require building an independent language parser.

Finally, we will show different ways in which Ruby can be used to implement an internal DSL, using as example the building of XML descriptions for documents.

NOTA

Bio

Guy Tremblay est professeur à l'UQAM depuis juin 1985. Il a obtenu son baccalauréat de l'UQAM, sa maîtrise de l'Université de Waterloo, puis, tout en enseignant à l'UQAM, il a complété son doctorat en informatique à l'Université McGill. Sa thèse (1994) portait sur la mise en oeuvre de langages fonctionnels paresseux sur des architectures parallèles à flux de données.

Ses activités de recherche portent sur la programmation parallèle, les méthodes formelles de spécification et vérification ainsi que leurs applications aux services web et aux composants logiciels. Il s'intéresse aussi au développement d'outils d'aide à l'enseignement et à la correction.

En 2000, il a publié un manuel sur les méthodes formelles de spécification. Il a participé au projet du Guide to the SWEBOOK en tant que Knowledge Area Specialist et Associate Editor pour la conception logicielle.

De 2001 à 2006, il a été directeur du programme de baccalauréat en informatique et génie logiciel. Durant cette même période, il a aussi été membre (vice-président en 2005-06) du Conseil d'accréditation des programmes d'informatique de l'Association Canadienne de l'Informatique. De 2009 à 2014, il a été directeur du département d'informatique.

En 2010, il a obtenu le "Prix d'excellence en enseignement de la Faculté des sciences de l'UQAM", puis l'année suivante il a obtenu le "Prix d'excellence en enseignement de l'UQAM".

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=qt7w

Individual Seminars

Anno accademico:	2009/2010
Codice attività didattica:	IS
Docente:	
Contatti docente:	
Anno:	1° anno 2° anno 3° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	0
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Italiano
Frequenza:	Facoltativa
Tipologia esame:	Orale

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=5f6a

Intelligent agents: modeling and reasoning techniques

Anno accademico:	2011/2012
Codice attività didattica:	IAMRT2011
Docente:	Prof. Alberto Martelli (Titolare del corso) Matteo Baldoni (Titolare del corso) Prof. Laura Giordano (Titolare del corso)
Contatti docente:	+39 011 670 67 31, mrt@di.unito.it
Anno:	1° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	2
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Italiano
Frequenza:	Obbligatoria
Tipologia esame:	Orale

OBIETTIVI FORMATIVI

The purpose of the course is to present modeling and reasoning techniques for intelligent agents, based on formal methods. Intelligent agents will be presented from two viewpoints. First of all, it will be shown how to model the behavior of a single agent, in particular referring to the belief- desire-intention (BDI) model. Then, the problem of modeling and reasoning in multi-agent systems will be tackled, by describing communication and cooperation among agents.

Interaction and communication are fundamental abstractions of any distributed system, especially when cross-business and business-to-business systems are to be developed. Multi-agent systems are the tools that currently better meet the needs emerging in this context because they offer proper abstractions. Interaction protocols represent a key issue for simplifying the coordination problems and the notion of social agency is emerging as a foundation for giving a verifiable semantics to them.

The course will show how the above models can be implemented by using computational fragments of the logic formalisms presented, and how they can be used to prove properties of agent systems and agent interaction.

PROGRAMMA

Introduction to intelligent agents The belief-desire-intention model Formal techniques for modeling agents

- modal and temporal logics
- reasoning about actions Multiagent systems
- Agent Communication Languages and communication protocols
- Multiagent interactions: cooperation and negotiation Logic based specification and implementation of intelligent agents Verification of multi-agent systems: model checking Multiagent Decision Making: game theory, negotiation

TESTI CONSIGLIATI E BIBLIOGRAFIA

Michael Wooldridge, An Introduction to MultiAgent Systems, John Wiley & Sons, 2002

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=7d09

Intelligent agents: modeling and reasoning techniques

Anno accademico:	2012/2013
Codice attività didattica:	IAMRT2012
Docente:	Prof. Alberto Martelli (Titolare del corso) Matteo Baldoni (Titolare del corso) Prof. Laura Giordano (Titolare del corso)
Contatti docente:	+39 011 670 67 31, mrt@di.unito.it
Anno:	1° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	2
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Italiano
Frequenza:	Obbligatoria
Tipologia esame:	Orale

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PROGRAMMA

Introduction to intelligent agents The belief-desire-intention model Formal techniques for modeling agents

- modal and temporal logics
- reasoning about actions Multiagent systems
- Agent Communication Languages and communication protocols
- Multiagent interactions: cooperation and negotiation Logic based specification and implementation of intelligent agents Verification of multi-agent systems: model checking Multiagent Decision Making: game theory, negotiation

TESTI CONSIGLIATI E BIBLIOGRAFIA

Michael Wooldridge, An Introduction to MultiAgent Systems, John Wiley & Sons, 2002

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=ad75

Intelligent Decision Support Systems

Intelligent Decision Support Systems

Anno accademico:	2015/2016
Codice attività didattica:	IDSS2014
Docente:	Prof. Stefania Montani (Titolare del corso) Prof. Luigi Portinale (Titolare del corso)
Contatti docente:	+390131360158, stefania.montani@mfn.unipmn.it
Anno:	2° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	2
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Italiano
Frequenza:	Facoltativa
Tipologia esame:	Orale

PREREQUISITI

An overview of basic AI methodologies

OBIETTIVI FORMATIVI

The course aims at introducing Artificial Intelligence (AI) methodologies for the development of Intelligent Decision Support Systems (IDSS).

A general introduction to the topic of intelligent decision support will be provided, followed by the presentation and discussion of two main methodologies: Case-Based Reasoning (CBR) and Probabilistic Graphical Models (PGM) like Bayesian Networks and Influence Diagrams.

Examples in the areas of Business Intelligence, Planning under Uncertainty and Reliability of Systems will be provided.

RISULTATI DELL'APPRENDIMENTO ATTESI

General overview knowledge about CBR and PGM, and proof of an in-depth analysis of one specific topic.

MODALITÀ DI VERIFICA DELL'APPRENDIMENTO

Oral examination

Oral examination - seminar

PROGRAMMA

- Introduction to intelligent decision support (S. Montani)
- Case-Based Reasoning: (S. Montani)
 - Fundamentals,
 - Case Representation,
 - Case Retrieval,
 - Classification,
 - Advanced Techniques (CBR for time-series management, fuzzy-CBR)
- Bayesian Networks: (L. Portinale)
 - Fundamentals,

- Modeling Issues,
- Inference Algorithms,
- Sensitivity Analysis
- Decision Theory (outline) (L. Portinale)
- Influence Diagrams: (L. Portinale)
 - Modeling issues,
 - Inference Techniques

TESTI CONSIGLIATI E BIBLIOGRAFIA

Material provided by teachers

Pagina web del corso: <http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show? id=qt52>

Intelligent Decision Support Systems

Anno accademico:	2011/2012
Codice attività didattica:	IDSS2011
Docente:	Prof. Stefania Montani (Titolare del corso) Prof. Luigi Portinale (Titolare del corso)
Contatti docente:	+390131360158, stefania.montani@mfn.unipmn.it
Anno:	1° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	2
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Italiano
Frequenza:	Obbligatoria
Tipologia esame:	Orale

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 - Classification,
 - Advanced Techniques (CBR for time-series management, fuzzy-CBR)
-
- Bayesian Networks: (L. Portinale)
 - Fundamentals,
 - Modeling Issues,
 - Inference Algorithms,
 - Sensitivity Analysis
 - Decision Theory (outline) (L. Portinale)
 - Influence Diagrams: (L. Portinale)
 - Modeling issues,
 - Inference Techniques

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=8f4b

Intelligent Decision Support Systems

Intelligent Decision Support Systems

Anno accademico:	2013/2014
Codice attività didattica:	IDSS2013
Docente:	Prof. Stefania Montani (Titolare del corso) Prof. Luigi Portinale (Titolare del corso)
Contatti docente:	+390131360158, stefania.montani@mfn.unipmn.it
Anno:	2° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	2
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Italiano
Frequenza:	Facoltativa
Tipologia esame:	Orale

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Oral examination

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- Bayesian Networks: (L. Portinale)
 - Fundamentals,

- Modeling Issues,
- Inference Algorithms,
- Sensitivity Analysis
- Decision Theory (outline) (L. Portinale)
- Influence Diagrams: (L. Portinale)
 - Modeling issues,
 - Inference Techniques

TESTI CONSIGLIATI E BIBLIOGRAFIA

Material provided by teachers

NOTA

The course will be held in May 2014

Pagina web del corso: <http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show? id=4605>

Intelligent Decision Support Systems

Anno accademico:	2012/2013
Codice attività didattica:	IDSS2012
Docente:	Prof. Stefania Montani (Titolare del corso) Prof. Luigi Portinale (Titolare del corso)
Contatti docente:	+390131360158, stefania.montani@mfn.unipmn.it
Anno:	1° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	2
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Italiano
Frequenza:	Obbligatoria
Tipologia esame:	Orale

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PROGRAMMA

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- Case-Based Reasoning: (S. Montani)
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 - Case Representation,
 - Case Retrieval,
 - Classification,
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- Bayesian Networks: (L. Portinale)
 - Fundamentals,
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 - Inference Algorithms,
 - Sensitivity Analysis
- Decision Theory (outline) (L. Portinale)
- Influence Diagrams: (L. Portinale)
 - Modeling issues,
 - Inference Techniques

NOTA

The course will be held in May 2012

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=1b23

Intelligent Decision Support Systems

Intelligent Decision Support Systems

Anno accademico:	2014/2015
Codice attività didattica:	IDSS2014
Docente:	Prof. Stefania Montani (Titolare del corso) Prof. Luigi Portinale (Titolare del corso)
Contatti docente:	+390131360158, stefania.montani@mfn.unipmn.it
Anno:	2° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	2
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Italiano
Frequenza:	Facoltativa
Tipologia esame:	Orale

PREREQUISITI

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Examples in the areas of Business Intelligence, Planning under Uncertainty and Reliability of Systems will be provided.

RISULTATI DELL'APPRENDIMENTO ATTESI

General overview knowledge about CBR and PGM, and proof of an in-depth analysis of one specific topic.

MODALITÀ DI VERIFICA DELL'APPRENDIMENTO

Oral examination

Oral examination - seminar

PROGRAMMA

- Introduction to intelligent decision support (S. Montani)
- Case-Based Reasoning: (S. Montani)
 - Fundamentals,
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 - Case Retrieval,
 - Classification,
 - Advanced Techniques (CBR for time-series management, fuzzy-CBR)
- Bayesian Networks: (L. Portinale)
 - Fundamentals,

- Modeling Issues,
- Inference Algorithms,
- Sensitivity Analysis
- Decision Theory (outline) (L. Portinale)
- Influence Diagrams: (L. Portinale)
 - Modeling issues,
 - Inference Techniques

TESTI CONSIGLIATI E BIBLIOGRAFIA

Material provided by teachers

Pagina web del corso: <http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show? id=jnd5>

Learning representations for semantic relational data

Learning representations for semantic relational data

Anno accademico:	2014/2015
Codice attività didattica:	SEM-LRSRD
Docente:	
Contatti docente:	
Anno:	1° anno 2° anno 3° anno
Tipologia:	Seminario
Crediti/Valenza:	
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	Facoltativa
Tipologia esame:	Non prevista

PROGRAMMA

Learning representations for complex relational data has emerged at the crossroad between different research topics in machine learning. The motivation of this work is often driven by the applications themselves and by the nature of the data which are often complex (multimodal , heterogeneous , dynamic) , and multi- relational (e.g. biology, social networks). One possible approach is to map these data onto one or more continuous latent spaces in order to obtain representations on which it is possible to use classical machine learning methods. In recent years, several lines of research have developed these ideas, sometimes independently, and they are now represented in the «Learning Representations" community. The tools deployed rely on statistical modeling, on linear algebra with matrix or tensor factorization, or more recently on neural networks. The presentation will give a brief presentation of some of these methods and show applications in the field of semantic data analysis and social networks.

NOTA

Short Bio:

Patrick Gallinari is professor in Computer Science at Université Pierre et Marie Curie (UPMC), Paris. His research domain is primarily statistical machine learning with applications to domains involving semantic data like information retrieval. His recent work has focused on statistical modeling of complex relational data described by sequences, trees or graphs. Before that, he has been a pioneer of neural networks in France, participating to the development of this domain in Europe. He has also been director of the computer science lab. at UPMC for about 10 years.

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=vmj1

Learning with the Web. Structuring data for easing machine understanding

Learning with the Web. Structuring data for easing machine understanding

Anno accademico:	2013/2014
Codice attività didattica:	SEM-LEARNING
Docente:	
Contatti docente:	
Anno:	1° anno 2° anno 3° anno
Tipologia:	Seminario
Crediti/Valenza:	
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	Facoltativa
Tipologia esame:	Non prevista

OBIETTIVI FORMATIVI

Abstract: The Web offers a vast amount of unstructured content from which to discover or better understand entities, while also serving as the largest knowledge graph on which to ground content. Moreover, it offers a broad range of relationships

that already exist among entities. Most of the knowledge available on the Web is present as natural language text enclosed in Web documents aimed at human consumption. A common approach for obtaining programmatic access to such a knowledge uses information extraction techniques; it reduces texts written in natural languages to machine readable structures, from which it is possible to retrieve entities and relations, for instance obtaining answers to database-style queries.

In the first part of my talk, I will explain the theoretical foundations of the Named Entity Recognition and Disambiguation (NERD) initiative [1], detailing the challenges of the named entity recognition and named entity linking tasks. I will show the results NERD achieved in shared tasks such as ETAPE 2012, #MSM'13 and the results in benchmark such as CoNLL-2003 and TAC KBP 2011. In the second part of the talk, I will present the research we conducted for topic generation from annotated streams of heterogeneous data coming from social platforms such as Dailymotion, Youtube, Twitter, Facebook, and G+.

NOTA

The seminar will be held by Giuseppe Rizzo.

Short Bio: Giuseppe Rizzo is an Associate Research Fellow at the Multimedia Communications Department of EURECOM since July 2013. Currently Giuseppe is involved in the LinkedTV project and in the recent past has collaborated in the OpenSem and EventMedia projects. His main research interests include Information Extraction, Linked Data and Web Science. He is a devoted Web evangelist, fascinated by smart web applications and knowledge extraction techniques; he likes to consider the Web as a mine of real world entities. He obtained his Master in Computer Science at the Politecnico di Torino, Turin, Italy after defending his thesis with the subject of Semantic Classification and Clustering of Emails. Mixing Web techniques and intelligent agents became a love and he decided to pursue these studies in a PhD. He benefited from a PhD fellowship from Politecnico di Torino at the Department of Control and Computer Engineering, supervised by the legendary prof. Raffaele Meo. During this period, he was visiting PhD student at EURECOM, Sophia Antipolis, France, supervised by prof. Raphael Troncy.

Lingua universalis. Calcolo, informatica e linguaggio, ricordando Alan Turing

Anno accademico:	2012/2013
Codice attività didattica:	SEM-LINUNIV
Docente:	
Contatti docente:	
Anno:	1° anno 2° anno 3° anno
Tipologia:	Seminario
Crediti/Valenza:	
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Italiano
Frequenza:	Facoltativa
Tipologia esame:	Non prevista

OBIETTIVI FORMATIVI

Simone Martini del Dipartimento di Scienze dell'Informazione dell' Università di Bologna

terrà il seminario:

"Lingua universalis. Calcolo, informatica e linguaggio, ricordando Alan Turing"

Pagina web del corso: <http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show? id=485f>

Low-latency and high bandwidth TCP/IP protocol processing through an integrated HW/SW approach

Anno accademico:	2013/2014
Codice attività didattica:	SEM-LLHB
Docente:	
Contatti docente:	
Anno:	1° anno 2° anno 3° anno
Tipologia:	Seminario
Crediti/Valenza:	
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	Facoltativa
Tipologia esame:	Non prevista

OBIETTIVI FORMATIVI

Abstract:

Ultra low-latency networking is critical in many domains, such as high frequency trading and high performance computing (HPC), and highly desirable in many others such as VoIP and on-line gaming. In closed systems - such as those found in HPC - Infiniband, iWARP or RoCE are common choices as system architects have the opportunity to choose the best host configurations and networking fabric. However, the vast majority of networks are built upon Ethernet with nodes exchanging data using the standard TCP/IP stack. On such networks, achieving ultra low-latency while maintaining compatibility with a standard TCP/IP stack is crucial.

To date, most efforts for low-latency packet transfers have focused on three main areas: (i) avoiding context switches, (ii) avoiding buffer copies, and (iii) off-loading protocol processing. We describes IBM PowerEN and its networking stack, showing that an integrated system design which treats Ethernet adapters as first class citizens that share the system bus with CPUs and memory, rather than as peripheral PCI Express attached devices, is a winning solution for achieving minimal latency. The presented work results in outstanding performance figures, including 1.30 μ s from wire to wire for UDP, usually the chosen protocol for latency sensitive applications, and excellent latency and bandwidth figures for the more complex TCP.

NOTA

The seminar will be held by (short bio):

Massimiliano Meneghin is a research engineer at IBM Dublin Lab. He got his PhD in computer science from the University of Pisa in 2010 with a study on a new optimisation theory for data parallel applications with stencils. During his PhD, Massimiliano worked also on a communications library for the IBM Cell BE architecture and he started collaborating with the FastFlow project on lock free queue algorithms.

In 2010, Massimiliano joined the IBM Research Dublin Lab, where he worked at the software stack for the IBM PowerEN architecture. He took part of the designed and developed an XML linux driver for the PowerEN XML accelerator and a TCP/IP software stack for the PowerEN ethernet adapter. During the same period, Massimiliano

also worked on new lock free queue algorithms and the impact of a new PowerEN instruction on synchronisation mechanisms for multithreading applications.

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=psrn

Markovian Stochastic Models

Anno accademico:	2012/2013
Codice attività didattica:	MSM2012
Docente:	Prof. Gianfranco Balbo (Titolare del corso) Prof. Andras Horvath (Titolare del corso)
Contatti docente:	(+39) 011 670 n6740, gianfranco.balbo@unito.it
Anno:	1° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	2
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Italiano
Frequenza:	Obbligatoria
Tipologia esame:	Scritto

OBIETTIVI FORMATIVI

The course provides an introduction to Markovian stochastic processes and related problems. The outline is:

- basic definitions, basic tools,
- discrete time Markov chains,
- continuous time Markov chains,
- brief intro to parameter estimation,
- hidden Markov models,
- model checking continuous time Markov chains.

PROGRAMMA

- basic definitions, basic tools,
- discrete time Markov chains,
- continuous time Markov chains,
- brief intro to parameter estimation,
- hidden Markov models,
- model checking continuous time Markov chains.

NOTA

class 1: 23/05/2012, 10-11

class 2: 25/5/2012, 14-17

class 3: 30/5/2012, 16-18

class 4: 1/6/2012, 14-16

class 5: 4/6/2012, 14-16

Pagina web del corso: <http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show? id=2061>

Meta-programming

Meta-programmin

Anno accademico:	2014/2015
Codice attività didattica:	MP1204
Docente:	Dott. Gianluca Torta (Titolare del corso)
Contatti docente:	0116706782, torta@di.unito.it
Anno:	1° anno 2° anno 3° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	2
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Italiano
Frequenza:	Obbligatoria
Tipologia esame:	Relazione finale

OBIETTIVI FORMATIVI

Meta-programming is a higher-level programming paradigm with the goal of constructing programs automatically. From this point of view, meta-programming is then just a special sub-field of programming.

Meta-programming is interesting because it can be considered as a higher-level thinking paradigm in programming, much needed as the complexity of software environments and applications keeps on with its fast growth.

There are too many forms and applications of meta-programming for hoping to cover all of them in one course: from higher-order functions to template-based programming, from DSLs (Domain Specific Languages) to various forms of reflection.

In our lessons we will cover in some detail macros, introduced in Lisp as a means to "make Lisp a programmable programming language" [1], and Meta-Object Protocols, also introduced in Lisp, as a way to define an extensible, and yet efficient, OO system on top of Lisp [2].

Macros and MOPs are used in today popular languages such as Clojure (a Lisp derivative that runs on the JVM [3]) and Perl [4,5], and we will look at some of their applications in these languages.

PROGRAMMA

1 Introduction to Meta Programming

1.1 What is MP

1.2 Forms and Applications of MP

2 Meta Programming with Macros

2.1 Functional Programming and Higher-Order Functions

2.2 Macros

2.3 Applications of Macros in Clojure

3 Meta Object Protocols

3.1 Definition of Meta-Object Protocol

3.2 MOPs in Functional Programming

3.3 MOPs in Perl

3.4 Applications of MOPs in Perl

TESTI CONSIGLIATI E BIBLIOGRAFIA

[1] P. Graham, "On Lisp: Advanced Techniques for Common Lisp", Prentice Hall (1993)

[2] G. Kiczales, J. des Rivieres, D. Bobrow, "The Art of the Metaobject Protocol", MIT Press (1991)

[3] D. Higginbotham, "Clojure for the Brave and True ", <http://www.braveclojure.com/>

[4] chromatic, "Modern Perl", Onyx Neon Press (2011)

[5] M.J. Dominus, "Higher-Order Perl", Morgan Kaufman (2005)

NOTA

The course will be held in October.

Pagina web del corso: <http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show? id=vvwp>

Meta-programming

Meta-programming

Anno accademico:	2014/2015
Codice attività didattica:	MP1415
Docente:	Dott. Gianluca Torta (Titolare del corso)
Contatti docente:	0116706782, torta@di.unito.it
Anno:	1° anno 2° anno 3° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	2
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Italiano
Frequenza:	Obbligatoria
Tipologia esame:	Relazione finale

OBIETTIVI FORMATIVI

Meta-programming is a higher-level programming paradigm with the goal of constructing programs automatically. From this point of view, meta-programming is then just a special sub-field of programming.

Meta-programming is interesting because it can be considered as a higher-level thinking paradigm in programming, much needed as the complexity of software environments and applications keeps on with its fast growth.

There are too many forms and applications of meta-programming for hoping to cover all of them in one course: from higher-order functions to template-based programming, from DSLs (Domain Specific Languages) to various forms of reflection.

In our lessons we will cover in some detail macros, introduced in Lisp as a means to "make Lisp a programmable programming language" [1], and Meta-Object Protocols, also introduced in Lisp, as a way to define an extensible, and yet efficient, OO system on top of Lisp [2].

Macros and MOPs are used in today popular languages such as Clojure (a Lisp derivative that runs on the JVM [3]) and Perl [4,5], and we will look at some of their applications in these languages.

PROGRAMMA

1 Introduction to Meta Programming

1.1 What is MP

1.2 Forms and Applications of MP

2 Meta Programming with Macros

2.1 Functional Programming and Higher-Order Functions

2.2 Macros

2.3 Applications of Macros in Clojure

3 Meta Object Protocols

3.1 Definition of Meta-Object Protocol

3.2 MOPs in Functional Programming

3.3 MOPs in Perl

3.4 Applications of MOPs in Perl

TESTI CONSIGLIATI E BIBLIOGRAFIA

[1] P. Graham, "On Lisp: Advanced Techniques for Common Lisp", Prentice Hall (1993)

[2] G. Kiczales, J. des Rivieres, D. Bobrow, "The Art of the Metaobject Protocol", MIT Press (1991)

[3] D. Higginbotham, "Clojure for the Brave and True ", <http://www.braveclojure.com/>

[4] chromatic, "Modern Perl", Onyx Neon Press (2011)

[5] M.J. Dominus, "Higher-Order Perl", Morgan Kaufman (2005)

NOTA

The course will be held in february, 2015.

Pagina web del corso: <http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show? id=tbmy>

Mining Moving Objects: Challenges and Directions

Anno accademico:	2012/2013
Codice attività didattica:	SEM-MMO
Docente:	
Contatti docente:	
Anno:	1° anno 2° anno 3° anno
Tipologia:	Seminario
Crediti/Valenza:	0
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Italiano
Frequenza:	Facoltativa
Tipologia esame:	Non prevista

OBIETTIVI FORMATIVI

Nowadays, the use of many electronic devices in real world applications has led to an increasingly large amount of data containing moving object information. One of the objectives of spatiotemporal data mining is to analyze such datasets to understand the object movement behavior. In this context, many recent studies have been defined to mine moving object clusters including flocks, moving clusters, convoy queries, closed swarms, group patterns, etc. Although these patterns are interesting and useful, mining and analyzing them is still challenging. There are several key questions, to answer, such as: 1) How can we extract and compare them efficiently? 2) Are they good enough to represent the complex object movement behavior? 3) Among the thousands of patterns, which ones are the most important to summarize a moving object dataset? In this talk, we introduce, analyze and address these three challenges and propose future research directions.

Teacher: Dino Ienco (Chargé de Recherche @ IRSTEA, Montpellier, France)

Pagina web del corso: <http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?id=681e>

Models of collective mood: applications to financial market prediction

Anno accademico:	2012/2013
Codice attività didattica:	SEM-MCM
Docente:	
Contatti docente:	
Anno:	1° anno 2° anno 3° anno
Tipologia:	Seminario
Crediti/Valenza:	0
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	Facoltativa
Tipologia esame:	Non prevista

PROGRAMMA

Hundreds of millions of individuals now subscribe to online social networking services which function as a medium for the exchange of personal as well as public information. Advances in natural language processing now allow us to tap into that reservoir of psycho-social data, and perform computational social science in realtime. In this presentation I will provide an overview of existing text analysis approaches that have been used to extract indicators of social opinion and sentiment from social media data. Researchers have used these techniques to gauge "national happiness" as well as consumer sentiment towards particular brands and products. Perhaps most tantalizing, evidence has been found that social media feeds may contain predictive information with regards to a variety of socio-economic phenomena, such as movie box office receipts, product adoption rates, elections, and even stock market fluctuations. With respect to the latter, I will outline our own research on the subject of stock market prediction. My team and I have analyzed large-scale Twitter data to assess daily fluctuations of the public's mood state. We found that these fluctuations contain predictive information with regards to up and down movements of broad market indices, such as the Dow Jones Industrial Average. In other research, we have demonstrated the assortative nature of online sentiment by comparing the mood states of individual users over time to their social network neighbors. My presentation will conclude with an overview of a research project that we are presently involved in to predict adverse societal events from social networking markers.

NOTA

BIO: Johan Bollen is an associate professor at the Indiana University School of Informatics and Computing.

He was formerly a staff scientist at the Los Alamos National Laboratory (2005-2009) and an Assistant Professor at the Department of Computer Science of Old Dominion University (2002 to 2005). He obtained his PhD in Psychology from the Vrije Universiteit Brussel in 2001. He has published approximately 70 peer-reviewed papers on problems in web science, social media analytics, sentiment tracking, digital libraries, informetrics, and computational social science. His research has been funded by the Andrew W. Mellon Foundation, National Science Foundation, Library of Congress, National Aeronautics and Space Administration, IARPA, and the Los Alamos National Laboratory. He has taught courses on informatics, web and data mining, information retrieval and digital libraries, and supervised numerous graduate and PhD students.

Pagina web del corso: <http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?id=139e>

Network Analysis and Social Media

Anno accademico:	2012/2013
Codice attività didattica:	NASM2012
Docente:	Prof. Giancarlo Francesco Ruffo (Titolare del corso) Prof. Matteo Sereno (Titolare del corso)
Contatti docente:	0116706771, ruffo@di.unito.it
Anno:	1° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	2
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Italiano
Frequenza:	Obbligatoria
Tipologia esame:	Orale

OBIETTIVI FORMATIVI

Il corso ha lo scopo di presentare alcune delle domande aperte e oggetto attuale di ricerca, sia teorica che applicativa, legate all'uso dei modelli a Reti Complesse, con particolare riferimento all'ambito dei Social Media.

Il modulo è quindi in un certo senso complementare al corso che già è offerto agli studenti della nostra laurea magistrale, nel senso che è più focalizzato sulle domande aperte interessanti per gli informatici e sugli strumenti di analisi esistenti essenziali agli aspetti di indagine empirica su reti reali di grandi dimensioni.

Una lista (provvisoria) di argomenti è la seguente:

- Richiami di teoria dei grafi e uso nell'ambito delle reti sociali, biologiche, tecnologiche e di informazione;
- Matematica a supporto dell'analisi di reti complesse
- Misure di centralità e similarità
- Leggi di potenza ed invarianza di scala
- Analisi strutturale di grafi di grandi dimensioni
- Analisi di processi dinamici nelle reti
- Analisi di Social Media e Applicazioni
- Community Detection (strutturale e dinamica)
- Modelli a grafi random (Erdos&Renyi, Watts&Strogatz, Barabasi)
- Strumenti di analisi e visualizzazione: Gephi, igraph

NOTA

The course will be held on June 2012

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=ea08

nlp4twitter

Anno accademico:	2015/2016
Codice attività didattica:	
Docente:	
Contatti docente:	
Anno:	
Tipologia:	A scelta dello studente
Crediti/Valenza:	
SSD attività didattica:	
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	
Tipologia esame:	

PREREQUISITI

1. Linux, bash, markdown and python (I could give a short tutorial on this as well, but c'mon :) 2. Some knowledge of probability, but the course will be selfcontained. Perhaps many of the participants have already read Jurafsky and Martin, that should be enough.

OBIETTIVI FORMATIVI

In this tutorial, we will analyze some of the most recent natural language processing techniques for extracting detailed information from tweets.

MODALITÀ DI VERIFICA DELL'APPRENDIMENTO

1. A project, 80% of the final grade (preferably with some issues in Italian)
2. A presentation of an assigned paper, 20% of the final grade

Given that my Italian is nonexistent, and that there's always much more work in English, we will try to make this course a good contribution to Italian NLP.

PROGRAMMA

We will cover several topics in this course. Some of them include:

1. POSTagging
2. Sentiment analysis/classification
3. Polarity
4. Namedentity recognition
5. Event detection
6. topic identification/modelling
7. Latent semantic analysis

8. Dirichlet allocation

9. Language modelling

10. "interestingness"

11. ...

to name but a few of what we might cover. To this, we have to add the "high performance" part of it:

1. Frameworks: hadoop, spark

2. Parallel programming: parallel (bash), pyparallel (python)

This is simply a list of topics, I'd be very interesting in hearing what students might be interested in as well. Shoot me an email!

TESTI CONSIGLIATI E BIBLIOGRAFIA

<http://leoferres.github.io/nlp.html>

NOTA

The first class will be a tutorial on using the following tools:

1. Jupyter notebooks

2. NLTK & spaCY

3. Scikit learn

4. Matplotlib

and we will probably use some other tools in the Python stack.

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=pjz

On raising the level of abstraction in the simulation of the microthreaded many-cores architecture

Anno accademico:	2012/2013
Codice attività didattica:	SEM-MICROTHREAD
Docente:	
Contatti docente:	
Anno:	1° anno 2° anno 3° anno
Tipologia:	Seminario
Crediti/Valenza:	0
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	Facoltativa
Tipologia esame:	Orale

OBIETTIVI FORMATIVI

The Computer Systems Architecture (CSA) group at the University of Amsterdam (UvA) has designed a general-purpose many-cores architecture called the Microgrid. It is based on the microthreading model with dataflow scheduling and asynchronous completion in the execution of the instructions to achieve fine-grained latency tolerance. It has many simple and energy efficient cores on a single chip. Through hardware concurrency management it is possible to partition the chip and dynamically allocate different software components to different parts of the chip. Ideally computer architects want a design to be quickly realized in silicon. However, the realization in silicon is expensive and require a lot of engineering work therefore the design must be fully evaluated. An alternative approach is to built an FPGA prototype, but again because of the complexity and development time it is not always the preferred approach at the beginning stage of the design. The most commonly used approach is to develop cycle-accurate simulator soon after the design is proposed. Evaluating the architecture parameters and mapping software components to different parts of the chip to achieve efficiency are both complex simulation problems. A cycle-accurate simulator is less complex and require little development time compared to an FPGA prototype and it can simulate all the components in detail to achieve the same accuracy. However, when exploring

large design spaces, as found in the Microgrid, the simulation time becomes a limiting factor. The alternative is to trade off some accuracy with the simulation time for a typical simulation experiment. At University of Amsterdam we have investigated high-level simulation techniques using a co-simulation approach. Although this approach is not restricted to the Microgrid, it is evaluated in this context. We have added the system-level simulation framework to the designer's toolbox which complements the cycle-accurate simulator with some simulation technique that are fast, reasonably accurate and useful for design space exploration.

NOTA

The lecture will be held by

Irfan Uddin, Dipartimento di Informatica, Università di Torino

Pagina web del corso: <http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show? id=c8b3>

Ontologie informatiche

Anno accademico:	2012/2013
Codice attività didattica:	SEM-ONTOINFO
Docente:	
Contatti docente:	
Anno:	1° anno 2° anno 3° anno
Tipologia:	Seminario
Crediti/Valenza:	0
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Italiano
Frequenza:	Facoltativa
Tipologia esame:	Non prevista

OBIETTIVI FORMATIVI

venerdì 5 ottobre, dalle ore 9 alle ore 11, ci sarà un incontro in Sala Riunioni, avente come tema le ontologie informatiche.

L'incontro si configura come una breve presentazione delle ontologie in uso (ribadisco 'in uso') nei vari progetti in cui è coinvolto il Gruppo di ricerca "Interaction Models". Dopo una prima riunione preliminare, abbiamo deciso che questa seconda riunione fosse aperta a tutti gli interessati.

L'obiettivo di questa serie di incontri è quello di verificare la possibilità di definire infrastrutture e connessioni tra ontologie che consentano di ridurre duplicazioni e ridondanze e favorire la condivisione e l'interscambio di conoscenza.

Nel caso vi sia un interesse diffuso, si può pensare ad una successiva riunione per presentazioni di altri colleghi.

Il programma di venerdì prevede 6 interventi, della durata di 12 minuti ciascuno. Come è noto a tutti, in ambienti di convegni e riunioni 6x12='circa 85', per cui è prevista una discussione finale di 30-40 minuti per capire come procedere.

Ciao a tutti

Leonardo

PROGRAMMA:

- Leonardo Lesmo: Introduzione e ontologie per progetti NLP
- Vincenzo Lombardo: Ontologie e drammaturgia (CADMOS)
- Rossana Damiano: Ontologie in ambito Cultural Heritage (Labyrinth)
- Daniele Radicioni: WordNet e MultiWordNet per applicazioni giuridiche
- Livio Robaldo: Ontologie giuridiche: MensLegis
- Luigi Di Caro: Estrazione automatica di ontologie

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=26c2

Phase-based Minimalist Grammars (PMGs) and Top-Down derivations

Anno accademico:	2013/2014
Codice attività didattica:	SEM-PBMG
Docente:	
Contatti docente:	
Anno:	1° anno 2° anno 3° anno
Tipologia:	Seminario
Crediti/Valenza:	
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	Facoltativa
Tipologia esame:	Non prevista

OBIETTIVI FORMATIVI

The goal of this talk is to provide empirical (and logical) arguments in favor of a derivational view of the grammar in which structure building occurs, incrementally, top-down (Chesi 2004a, 2007) and from left to right (Phillips 1996, 2003).

Following the Minimalist research spirit (Chomsky 1995-2008), I will show that the bottom-to-top orientation of phrase structure building (that is the standard mainstream assumption) is not a "virtual conceptual necessity" and that we can gain in descriptive adequacy if we move away from the idea that the basic recursive operation is a set formation operation like Merge.

Here I would also propose a parsing algorithm that, similarly to Early 1980, provide a constituent (complete) analysis of the input sentence, directly using phrase structure building operations that are part of the Phase-based Minimalist Grammar.

NOTA

The seminar will be held by:

dott. Cristiano Chesi, Università di Pavia

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=njug

Presentazione proposte tesi di dottorato - ciclo XXVI

Anno accademico:	2012/2013
Codice attività didattica:	SEM-PROPDOT26
Docente:	
Contatti docente:	
Anno:	1° anno 2° anno 3° anno
Tipologia:	Seminario
Crediti/Valenza:	0
SSD attività didattica:	
Erogazione:	Tradizionale
Lingua:	Italiano
Frequenza:	Facoltativa
Tipologia esame:	Non prevista

OBIETTIVI FORMATIVI

Nei giorni 17,18,19 ottobre, dalle 13 e 14 in sala seminari, i dottorandi dei ciclo XXVI esporranno le loro proposte di tesi.

Di seguito il calendario dettagliato: partecipate numerosi!

17/10, ore 13-14.30

- Francesco Osborne

"A framework for mining, revising and exploiting semantic relationships"

- Riccardo Loti

"Modeling and analysis of techniques to increase robustness in distributed systems"

- Alan Perotti

"Neural-Symbolic Rule-based Monitoring"

18/10, ore 13-14

- Rosaria Rossini

"Leveraging salient features for understanding time series data sets"

- Renato Accornero

"Accountable Identity Management in Federated Environments"

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=936d

Privacy and Data Protection

Privacy and Data Protection

Anno accademico:	2017/2018
Codice attività didattica:	INF0083-2
Docente:	Ruggero Gaetano Pensa (Titolare del corso)
Contatti docente:	0116706798, ruggero.pensa@unito.it
Anno:	1° anno 2° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	3
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	Obbligatoria
Tipologia esame:	Orale

OBIETTIVI FORMATIVI

The course aims at introducing the main methods for private big data protection. It focuses on the principal anonymization models that have been proposed for both statistical databases (e.g., surveys, clinical data) and graph databases (e.g., social networks), with a special focus on the challenges of the so-called "Big Data Era".

RISULTATI DELL'APPRENDIMENTO ATTESI

- General overview knowledge about privacy breaches and big data protection methods - An improved awareness on the need for privacy enhancement in big data management and analysis - In-depth analysis of one specific topic

MODALITÀ DI VERIFICA DELL'APPRENDIMENTO

Oral examination on one specific topic with few questions aimed at assessing the overall comprehension of the course

PROGRAMMA

- The concept of privacy and privacy laws in different countries (2h) - The challenges of privacy in the "Big Data Era" (2h) - Privacy attacks and models in statistical databases (4h) - k-anonymity - l-diversity - t-closeness - Anonymization techniques (4h) - randomization - generalization - Differential privacy (4h) - Privacy attacks and models in graph databases (2h) - Graph anonymization techniques (1h) - Privacy self-assessment in social networks (1h)

TESTI CONSIGLIATI E BIBLIOGRAFIA

Material provided by teachers

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=gzrf

Privacy and Data Protection

Privacy and Data Protection

Anno accademico:	2016/2017
Codice attività didattica:	INF0083
Docente:	Ruggero Gaetano Pensa (Titolare del corso)
Contatti docente:	0116706798, ruggero.pensa@unito.it
Anno:	1° anno 2° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	2
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	Obbligatoria
Tipologia esame:	Orale

OBIETTIVI FORMATIVI

The course aims at introducing the main methods for private big data protection. It focuses on the principal anonymization models that have been proposed for both statistical databases (e.g., surveys, clinical data) and graph databases (e.g., social networks), with a special focus on the challenges of the so-called "Big Data Era".

RISULTATI DELL'APPRENDIMENTO ATTESI

- General overview knowledge about privacy breaches and big data protection methods - An improved awareness on the need for privacy enhancement in big data management and analysis - In-depth analysis of one specific topic

MODALITÀ DI VERIFICA DELL'APPRENDIMENTO

Oral examination on one specific topic with few questions aimed at assessing the overall comprehension of the course

PROGRAMMA

- The concept of privacy and privacy laws in different countries (2h) - The challenges of privacy in the "Big Data Era" (2h) - Privacy attacks and models in statistical databases (8h) - k-anonymity - l-diversity - t-closeness - delta-presence - Privacy preserving data mining (2h) - Differential privacy (4h) - Location privacy (1h) - Privacy attacks and models in graph databases (1h)

TESTI CONSIGLIATI E BIBLIOGRAFIA

Material provided by teachers

Pagina web del corso: <http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?id=y10q>

Privacy for Linked Data

Anno accademico:	2012/2013
Codice attività didattica:	SEM-PLD
Docente:	
Contatti docente:	
Anno:	1° anno 2° anno 3° anno
Tipologia:	Seminario
Crediti/Valenza:	0
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	Facoltativa
Tipologia esame:	Non prevista

PROGRAMMA

Web of Linked Data aims at the introduction of common format and principles for publishing data on the Web, such that they can be easily interconnected and exploited. The current recommendation is to use URIs as names and RDF directed graph data, which can be consumed by use of a query language such as SPARQL. The lack of privacy mechanisms often discourages people from publishing data in the Web of Linked Data. We propose a formal model which ensures privacy protection of a single RDF triple. In our calculus, processes are those from calculus for Linked Data of Horne and Sassone, associated with parallel composition of RDF triples. These triples describe the web-profile of the user that aims at performing an action. An administrator of a data graph in the observed system defines a privacy protection policy for each triple of the data in RDF format. A process running on behalf of a user is allowed to access a triple if the privacy protection policy gives the positive answer applied to the user's profile. The introduced type system verifies policy conformance, assuring that in a well-typed network:

- the privacy protection policy of each stored triple agrees with the privacy administration policy of the graph it belongs to. This induces the property that if a process has a privilege to administrate policies in a data graph, it can access each triple in the graph,
- a process can administrate the privacy protection policy of a stored triple in a data graph only if its profile contains a property that is in the administration policy of the data graph and
- a process can read a stored triple only if its profile contains a property that is in the privacy policy of the stored triple.

NOTA

SEMINAR HELD BY:

Svetlana Jakšić

(<http://imft.ftn.uns.ac.rs/~svetlana/>)

University of Novi Sad

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=6f11

Progetti di Ricerca: Finanziamento e Gestione

Anno accademico:	2013/2014
Codice attività didattica:	PRFG
Docente:	
Contatti docente:	
Anno:	1° anno 2° anno 3° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	
SSD attività didattica:	
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	Facoltativa
Tipologia esame:	Relazione finale

OBIETTIVI FORMATIVI

CORSO SUL FINANZIAMENTO PUBBLICI DELLA RICERCA

1) Il finanziamento della ricerca, le politiche Europee e gli strumenti attualmente in uso per la ricerca comunitaria

Il finanziamento della ricerca Il MIUR

Cenni sulla ricerca finanziata in ambito nazionale

Siti di riferimento

I Poli tecnologici e i progetti POR

Cenni sulla ricerca finanziata in ambito regionale

Siti di riferimento

I finanziamenti europei

Le politiche di finanziamento europeo per la ricerca

Struttura delle DG

Le piattaforme tecnologiche

La definizione dei contenuti dei workprogram

Il 7° Programma Quadro per la ricerca e lo sviluppo tecnologico

Struttura e contenuti del settimo programma quadro Dettagli sul contenuto ICT

Lettura di un Workprogram

Temi , Challanges , objectives and target outcomes

I principali strumenti di finanziamento e il loro funzionamento IL CIP

Cenni su Horizon 2020

2) La presentazione di una proposta Finanziamento diretto e indiretto Chi può accedere ai finanziamenti Schemi di finanziamento

Il ciclo di vita di una proposta Il participant portal Preparazione di una proposta

Scelta del bando

Analisi delle call

I documenti di riferimento Scelta del consorzio

3) Preparazione della parte B (allegato tecnico della proposta) e elementi di successo Strutturazione della proposta nei suoi 3 capitoli principali

Obiettivi e stato dell'arte

Preparazione di un piano di progetto

Workpackages, Milestones e Deliverables L'analisi dei rischi

Il Management

La struttura del consorzio

L'impatto

Dissemination ed exploitation Analisi di un esempio

4) Aspetti Amministrativi e preparazione della parte A (allegato finanziario) Modalità di finanziamento

Costi diretti e indiretti

I form A e relativi contenuti

Il gantt, i mesi uomo, il budget

Analisi di un foglio excel di esempio per la configurazione del budget

5) Dalla Proposal Submission all'esecuzione del progetto Sottomissione di una proposta

Le modalità di valutazione di una proposta

Come iscriversi alla sezione degli 'expert' Negoziazione e gestione di una proposta

Il consortium Agreement e la protezione degli IPR I principali documenti di avanzamento progetto

I cost statements

I review meeting

I reviewer indipendenti e il project officer

NOTA

Il corso sarà tenuto dall'Ing. Marialuisa Sanseverino.

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=amu3

Programming using Automata and Transducers

Programming using Automata and Transducers

Anno accademico:	2014/2015
Codice attività didattica:	SEM-PAT
Docente:	
Contatti docente:	
Anno:	1° anno 2° anno 3° anno
Tipologia:	Seminario
Crediti/Valenza:	
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	Facoltativa
Tipologia esame:	Non prevista

PROGRAMMA

Finite automata have proven to be an effective tool to reason about programs operating over strings. Finite state transducers extend finite automata with outputs and can model functions from strings to strings such as natural language transformations. Due to their closure and decidability properties, these models are widely used in practice, and many extensions/improvements have been proposed. Here we mainly focus on bridging the gap between the theory of automata and transducers and practical applications. Our goal is to identify applications that can be modeled using automata and transducers, and design frontend languages that allow the user to reason about his or her program. While pursuing these general goal we also end up facing new theoretical problems such as the following. Can existing models be extended to infinite alphabets? Can we extend classical finite automata minimization algorithms to work with infinite alphabets? What is the complexity of checking equivalence for a particular class of transducers? We introduce novel minimization algorithms for symbolic automata over infinite alphabets that enable to efficiently generate secure passwords at random; and Fast a domain specific language for programs that manipulate trees over complex alphabets and show how Fast can be used to optimize functional programs that operate over trees by removing intermediate computation results. We also briefly present practical extension of symbolic automata and transducers in which transitions are allowed to read multiple symbols at a time, and show how this can be used to prove the correctness of complex string encoders; and symbolic visibly pushdown automata as an executable and programmable model to specify monitors for structured programs over arbitrary domains.

NOTA

The seminar will be held by

Loris D'Antoni

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=njeg

Qualitative and probabilistic system verification

Qualitative and probabilistic system verification

Anno accademico:	2016/2017
Codice attività didattica:	INF0089
Docente:	Dott. Marco Beccuti (Titolare del corso) Prof. Susanna Donatelli (Titolare del corso) Jeremy James Sproston (Titolare del corso)
Contatti docente:	+39 011 6706780, marco.beccuti@unito.it
Anno:	1° anno 2° anno 3° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	2
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	Obbligatoria
Tipologia esame:	Relazione finale

OBIETTIVI FORMATIVI

Make the students obtain experience of system verification techniques, which can be used in a number of different research areas. Furthermore, the course will introduce to the students the use of symbolic data structures such as decision diagrams; while these have been developed in the context of system verification, they can also be used in contexts in which an efficient representation of information is necessary.

MODALITÀ DI VERIFICA DELL'APPRENDIMENTO

The exam has to be agreed on with the lecturer, but will principally comprise "hands-on" exercises with verification tools together with an theoretical analysis of a topic either not considered in depth during the course, or on a topic considered more exhaustively, in which case there will be a focus on the implications of the topic for the field of research of the student.

PROGRAMMA

1. Temporal logics (LTL and CTL) and their associated model-checking algorithms for the verification of concurrent programs (typically expressed by guarded command languages) and of models (networks of automata or Petri nets). Examples of properties that can be verified are: "for all executions, if a process requests an access of the critical region, then it will eventually have such access", "for all executions, for every message sent, the sender will eventually receive an acknowledgement" or "for every state along every possible execution, if the system enters in a malfunction state, then there exists an execution path from that state that reaches a state corresponding to correct operation". The logics LTL and CTL permit the formalization of such properties and to prove them automatically for programs with a potentially huge state space. (Lecturer: Susanna Donatelli)

2. The extension of temporal logics to the probabilistic/stochastic setting (the logics PCTL and CSL). Examples of properties of interest are: "with probability greater than 0.95 the system obtains a resource within K time units after requesting it", or "with probability greater than 0.9 the system converges to a stable state within N transitions, despite being in the presence of M users with fraudulent behaviour". (Lecturer: Jeremy Sproston)

3. Overview of other logics and verification techniques (this part will depend also on the areas of interest of the students).

4. Symbolic data structures and algorithms for their definition and manipulation: from the binary decision diagrams popularized by Bryant to multiterminal decision diagrams considered by Ciardo and other researchers, and their associated libraries. (Lecturer: Marco Beccuti)

5. Tools: for the verification of LTL and CTL we will use at least nuSMV (University of Trento, the free version of the well-known commercial tool SMV, based on binary decision diagrams) and the model checker of GreatSPN (developed by the University of Turin, based on multiterminal decision diagrams). For probabilistic and stochastic verification we will use PRISM (developed by the University of Birmingham and the University of Oxford) and possibly MC4CSLTA (developed by the University of Turin).

Pagina web del corso: <http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?id=aupf>

Qualitative and probabilistic system verification

Qualitative and probabilistic verification of systems

Anno accademico:	2014/2015
Codice attività didattica:	QUALVER2014
Docente:	Prof. Susanna Donatelli (Titolare del corso)
Contatti docente:	<i>susanna.donatelli@unito.it</i>
Anno:	1° anno 2° anno 3° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	2
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Italiano
Frequenza:	Obbligatoria
Tipologia esame:	Relazione finale

OBIETTIVI FORMATIVI

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(developed by the University of Turin, based on multiterminal decision diagrams). For probabilistic and stochastic verification we will use PRISM (developed by the University of Birmingham and the University of Oxford) and possibly MC4CSLTA (developed by the University of Turin).

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=2etb

Qualitative and probabilistic system verification

Qualitative and probabilistic system verification

Anno accademico:	2015/2016
Codice attività didattica:	QUALVER1415
Docente:	Prof. Susanna Donatelli (Titolare del corso)
Contatti docente:	<i>susanna.donatelli@unito.it</i>
Anno:	1° anno 2° anno 3° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	2
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Italiano
Frequenza:	Obbligatoria
Tipologia esame:	Relazione finale

OBIETTIVI FORMATIVI

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(developed by the University of Turin, based on multiterminal decision diagrams). For probabilistic and stochastic verification we will use PRISM (developed by the University of Birmingham and the University of Oxford) and possibly MC4CSLTA (developed by the University of Turin).

Pagina web del corso: <http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?id=q8kp>

Qualitative and probabilistic system verification

Qualitative and probabilistic system verification

Anno accademico:	2017/2018
Codice attività didattica:	INF0089-2
Docente:	Prof. Susanna Donatelli (Titolare del corso) Dott. Marco Beccuti (Titolare del corso) Jeremy James Sproston (Titolare del corso)
Contatti docente:	<i>susanna.donatelli@unito.it</i>
Anno:	1° anno 2° anno 3° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	Obbligatoria
Tipologia esame:	Relazione finale

OBIETTIVI FORMATIVI

Make the students obtain experience of system verification techniques, which can be used in a number of different research areas. Furthermore, the course will introduce to the students the use of symbolic data structures such as decision diagrams; while these have been developed in the context of system verification, they can also be used in contexts in which an efficient representation of information is necessary.

MODALITÀ DI VERIFICA DELL'APPRENDIMENTO

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Pagina web del corso: <http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?id=x07a>

Rappresentazione della conoscenza, ragionamento e applicazioni

Knowledge Representation, reasoning and applications

Anno accademico:	2017/2018
Codice attività didattica:	INF0085-2
Docente:	Matteo Baldoni (Titolare del corso) Cristina Baroglio (Titolare del corso) Valentina Gliozzi (Titolare del corso) Dott. Roberto Micalizio (Titolare del corso) Gian Luca Pozzato (Titolare del corso)
Contatti docente:	0116706756, matteo.baldoni@unito.it
Anno:	1° anno 2° anno 3° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	3
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Italiano
Frequenza:	Obbligatoria
Tipologia esame:	

PROGRAMMA

Obiettivo del corso è fornire le nozioni di base riguardo l'uso della logica nella rappresentazione della conoscenza e i relativi meccanismi di ragionamento, considerando, in particolare, applicazioni ai sistemi multiagenti ed alla diagnosi. Nel corso verranno presentati i seguenti contenuti: logiche modali, epistemiche e temporali; logiche descrittive e OWL2; metodi di prova per le logiche descrittive; ragionamento non-monotono e trattamento delle eccezioni; sistemi multiagente e modelli di interazione e comunicazione fra agenti; diagnosi e sistemi multiagenti.

The aim of the course is to provide the main notions concerning the use of logic for knowledge representation, the related reasoning techniques and some applications to multiagent systems and diagnosis. The course will address the following topics: modal, epistemic and temporal logics; description logics and OWL2; proof methods for description logics; non-monotonic reasoning and reasoning about exceptions; multi-agent systems and agent communication; diagnosis and multiagent systems.

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=df0b

Rappresentazione della conoscenza, ragionamento e applicazioni

Knowledge Representation, reasoning and applications

Anno accademico:	2016/2017
Codice attività didattica:	INF0085
Docente:	Matteo Baldoni (Titolare del corso) Cristina Baroglio (Titolare del corso) Valentina Gliozzi (Titolare del corso) Dott. Roberto Micalizio (Titolare del corso) Gian Luca Pozzato (Titolare del corso)
Contatti docente:	0116706756, matteo.baldoni@unito.it
Anno:	1° anno 2° anno 3° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Italiano
Frequenza:	Obbligatoria
Tipologia esame:	

PROGRAMMA

Obiettivo del corso è fornire le nozioni di base riguardo l'uso della logica nella rappresentazione della conoscenza e i relativi meccanismi di ragionamento, considerando, in particolare, applicazioni ai sistemi multiagenti ed alla diagnosi. Nel corso verranno presentati i seguenti contenuti: logiche modali, epistemiche e temporali; logiche descrittive e OWL2; metodi di prova per le logiche descrittive; ragionamento non-monotono e trattamento delle eccezioni; sistemi multiagente e modelli di interazione e comunicazione fra agenti; diagnosi e sistemi multiagenti.

The aim of the course is to provide the main notions concerning the use of logic for knowledge representation, the related reasoning techniques and some applications to multiagent systems and diagnosis. The course will address the following topics: modal, epistemic and temporal logics; description logics and OWL2; proof methods for description logics; non-monotonic reasoning and reasoning about exceptions; multi-agent systems and agent communication; diagnosis and multiagent systems.

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=sitf

Rare Event Handling in Statistical Model Checking

Anno accademico:	2013/2014
Codice attività didattica:	SEM-REHSMC
Docente:	
Contatti docente:	
Anno:	1° anno 2° anno 3° anno
Tipologia:	Seminario
Crediti/Valenza:	0
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	Facoltativa
Tipologia esame:	Non prevista

OBIETTIVI FORMATIVI

Statistical model-checking is an alternative verification technique applied on stochastic systems whose size is beyond numerical analysis ability. Given a model (most often a Markov chain) and a formula, it provides a confidence interval for the probability that the model satisfies the formula. One of the main limitations of the statistical approach is the computation time explosion triggered by the evaluation of very small probabilities. In order to solve this problem we develop a new approach based on importance sampling, coupling and uniformization which apply in the discrete and continuous setting of time bounded or unbounded property. The corresponding algorithms have been implemented in our tool Cosmos.

TESTI CONSIGLIATI E BIBLIOGRAFIA

<http://www.lsv.ens-cachan.fr/~barbot/talks/barbizon2012.pdf>

NOTA

The seminar will be held by the ENS Student

Cachan Benoit Barbot

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=yropy

Real time systems

Real time systems

Anno accademico:	2017/2018
Codice attività didattica:	RTS17
Docente:	Prof. Enrico Bini (Titolare del corso)
Contatti docente:	0116706858, enrico.bini@unito.it
Anno:	1° anno 2° anno 3° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	
Tipologia esame:	

PROGRAMMA

Real time systems

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=vyro

Research Public Funding

Research Public Funding

Anno accademico:	2014/2015
Codice attività didattica:	RPF1415
Docente:	Marialuisa Sanseverino (Titolare del corso)
Contatti docente:	
Anno:	1° anno 2° anno 3° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	2
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	Obbligatoria
Tipologia esame:	Relazione finale

PROGRAMMA

1) Research Public funding

- National Projects

National funding sources outline

Web references

- Innovation clusters and structural funds

Regional funding outline

Web references

- European Funding

European Funding strategies

DG structure

Technological platforms

workprogram content definition

- Research 2014-2020 Program : HORIZON 2020

Horizon 2020 content and structure

ICT Workprogram

How to read a Workprogram

Objectives and expected impacts of the calls

- The main funding instruments and how to use them

2) Administrative features in research project preparation

- Direct and Indirect funding
- Who can get funding
- Funding Schemes
- Administrative and financial issues

Eligible costs

Direct costs

Indirect costs

Activities that can be funded

Computation of EU contribution

Payments

3) Proposal submission

- The proposal lifecycle
- The participant portal
- Proposal preparation steps
- Choice of the proper call
- Analysis of a workprogram
- Reference documents of a work program
- Choice of the consortium

5) Administrative issues related to part A (financial annex) preparation in a proposal

- The Gantt, Person/month evaluation ,the budget estimation
- An excel sheet for budget configuration
- A forms and related contents
- PIC (Participant Identification Code) and the company registration on the participant portal
- The electronic Submission

6) From Proposal Submission to project execution

- Proposal evaluation Process
- How to register on the 'expert' section
- Grant agreement signature and project start
- The consortium Agreement and IPR issues
- Project Management
- Main documents to assess the project progress
- Cost statements
- Review meeting

7) Exercise on proposals evaluation and scoring

NOTA

The course will be held in January, 2015.

Pagina web del corso: <http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show? id=kh12>

Research Public Funding

Research Public Funding

Anno accademico:	2014/2015
Codice attività didattica:	RPF2014
Docente:	Marialuisa Sanseverino (Titolare del corso)
Contatti docente:	
Anno:	1° anno 2° anno 3° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	2
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	Obbligatoria
Tipologia esame:	Relazione finale

PROGRAMMA

1) Research Public funding

- National Projects

National funding sources outline

Web references

- Innovation clusters and structural funds

Regional funding outline

Web references

- European Funding

European Funding strategies

DG structure

Technological platforms

workprogram content definition

- Research 2014-2020 Program : HORIZON 2020

Horizon 2020 content and structure

ICT Workprogram

How to read a Workprogram

Objectives and expected impacts of the calls

- The main funding instruments and how to use them

2) Administrative features in research project preparation

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Eligible costs

Direct costs

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6) From Proposal Submission to project execution

- Proposal evaluation Process
- How to register on the 'expert' section
- Grant agreement signature and project start
- The consortium Agreement and IPR issues
- Project Management
- Main documents to assess the project progress
- Cost statements
- Review meeting

7) Exercise on proposals evaluation and scoring

NOTA

CALENDAR

21/05 14-17 aula seminari

23/05 14-17 aula seminari

26/05 10-13 aula riunioni

28/05 14-17 aula seminari

4/06 14-17 aula seminari

5/06 14-17 aula seminari

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=cp54

Serendipità cibernetica: Tape Mark I

Anno accademico:	2013/2014
Codice attività didattica:	SEM-SEREN
Docente:	
Contatti docente:	
Anno:	1° anno 2° anno 3° anno
Tipologia:	Seminario
Crediti/Valenza:	0
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Italiano
Frequenza:	Facoltativa
Tipologia esame:	Non prevista

OBIETTIVI FORMATIVI

Cybernetic Serendipity è il nome di quella che a buon titolo può essere considerata la prima grande retrospettiva dedicata all'uso del calcolatore nelle arti. L'evento londinese del 1968 comprendeva personalità di spicco tra quelle che hanno contaminato le pratiche artistiche (musica, arti visive, animazione, poesia) con le procedure computazionali. Proprio la poesia figura tra i contributi italiani nel catalogo della mostra con Tape Mark I di Nanni Balestrini. In questo lavoro del 1962, Balestrini - esponente di punta della neoavanguardia e del Gruppo 63 - si confronta pionieristicamente con le possibilità generative offerte dal calcolatore.

Il seminario si propone di introdurre Cybernetic Serendipity per poi analizzare nel dettaglio Tape Mark I, in quanto esempio particolarmente significativo, nell'espressione di di Funkhouser, di "poesia digitale preistorica".

NOTA

Il seminario sarà tenuto da Nanni Balestrini

presso l'Auditorium Laboratorio Multimediale G. Quazza Palazzo Nuovo Via S. Ottavio 2

Pagina web del corso: <http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show? id=1c1i>

Space Lower Bounds in Algebraic Proof Systems

Anno accademico:	2013/2014
Codice attività didattica:	SEM-SLBAPS
Docente:	
Contatti docente:	
Anno:	1° anno 2° anno 3° anno
Tipologia:	Seminario
Crediti/Valenza:	
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	Facoltativa
Tipologia esame:	Non prevista

OBIETTIVI FORMATIVI

Abstract:

The study of space measure in Proof Complexity has gained in the last years

more and more importance: first it is clearly of theoretical importance in the study of complexity of proofs;

second it is connected with SAT solving, since it might provide theoretical explanations of efficiency or inefficiency of

specific Theorem Provers or SAT-solvers; finally in certain cases (like the calculus of Resolution)

it is connected with important characterizations studied in Finite Model Theory, thus providing a solid link between the two research fields.

In the talk I will present a recent work, where we devise a new general combinatorial framework for proving space lower bounds in algebraic proof systems like Polynomial Calculus (PC) and

Polynomial Calculus with Resolution (PCR). A simple case of our method allows us to obtain all the

currently known space lower bounds for PC and PCR.

Our method can be viewed as a Spoiler-Duplicator game, which is capturing boolean reasoning on polynomials.

Hence, for the first time, we move the problem of studying the space complexity for algebraic proof systems in the range

of 2-players games, as is the case for Resolution. This can be seen as a first step towards a precise

characterization of the space for algebraic systems in terms of combinatorial games, like

Ehrenfeucht-Frassè, which are used in Finite Model Theory.

More importantly, using our approach in its full potentiality, we answer to

the open problem of proving space lower bounds in Polynomial Calculus and Polynomials Calculus with Resolution for the polynomial encoding of randomly chosen k -CNF formulas. Our result holds for $k \geq 4$. Then in PC and in PCR refuting a random k -CNF over n variables requires high space measure of the order of $\Omega(n)$. Our method also applies to the Expander Graph PigeonHole Principle, which is a PigeonHole Principle defined over a constant (left) degree bipartite expander graph.

In the talk I will discuss a number of open problems which arise from our works which might be solved generalizing our approach.

It is a joint work with Ilario Bonacina, appeared in the Proceedings of Innovations in Theoretical Computer Science 2013.

NOTA

The seminar will be held by

Nicola Galesi

Sapienza University - Rome

Pagina web del corso: <http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show? id=7pp2>

Specifying Stateful Asynchronous Properties for Distributed Programs

Anno accademico:	2013/2014
Codice attività didattica:	SEM-SAPDP
Docente:	
Contatti docente:	
Anno:	1° anno 2° anno 3° anno
Tipologia:	Seminario
Crediti/Valenza:	
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	Facoltativa
Tipologia esame:	Non prevista

OBIETTIVI FORMATIVI

Abstract: Having stateful specifications to track the states of processes, such as the balance of a customer for online shopping or the booking number of a transaction, is needed to verify real-life interacting systems. For safety assurance of distributed IT infrastructures, specifications need to capture states in the presence of asynchronous interactions. We demonstrate that not all specifications are suitable for asynchronous observations because they implicitly rely on an order-preservation assumption. To establish a theory of asynchronous specifications, we use the interplay between synchronous and asynchronous semantics, through which we characterise the class of specifications suitable for verifications through asynchronous interactions. The resulting theory offers a general semantic setting as well as concrete methods to analyse and determine semantic well-formedness (healthiness) of specifications with respect to asynchronous observations, for both static and dynamic verifications. In particular, our theory offers a key criterion for suitability of specifications for distributed dynamic verifications.

NOTA

TEACHER:

Dott. Tzu-Chun Chen, Queen Mary university

Pagina web del corso: <http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show? id=bpqu>

Temporal Data Bases

Anno accademico:	2011/2012
Codice attività didattica:	TDB2011
Docente:	Prof. Paolo Terenziani (Titolare del corso)
Contatti docente:	<i>paolo.terenziani@unipmn.it</i>
Anno:	1° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	2
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Italiano
Frequenza:	Obbligatoria
Tipologia esame:	Orale

OBIETTIVI FORMATIVI

The treatment of temporal aspects plays an important role in Databases. Since the 80', researchers have shown that, in order to properly cope with time, new techniques and extensions to the standard DB approaches are needed, motivating the birth of a new area of research: "Temporal Databases". After a brief motivating introduction, the course will survey some of the main results of the area, with a specific focus on relational temporal DBs and their semantics.

RISULTATI DELL'APPRENDIMENTO ATTESI

Knowledge of the main problems involved in the treatment of time in the area of databases, of the main solutions, and of the currently open issues.

Methodology for the development of a temporal database model: from the semantics to the representation/implementation

PROGRAMMA

- (1) Introduction. A motivating introduction to Temporal Databases. In particular, the limitation of classical approaches (e.g., SQL) to cope with time will be discussed.
- (2) Description of the TSQL2 approach, a "reference" and "consensus" approach in the area of Temporal Databases.
- (3) Description of BCDM, a uniform model to cope with the semantics of Temporal Databases
- (4) Main issues in the development of semantic-based approaches to Temporal Databases. Formal analysis of the most relevant properties of Temporal Database approaches
- (5) Advanced temporal issues (e.g., multiple granularities, telic/atelic data, temporal indeterminacy, temporal constraints and temporal reasoning)

TESTI CONSIGLIATI E BIBLIOGRAFIA

MAIN REFERENCE BOOK:

R.T. Snodgrass (editor), I. Ahn, G. Ariav, D. Batory, J. Clifford, C. Dyreson, R. Elmasri, F. Grandi, C. Jensen, W. Käfer, N. Kline, K. Kulkarni, C. Leung, N. Lorentzos, J. Roddick, A. Segev, M. Soo, S.M. Sripada, The Temporal Query Language TSQL2, Kluwer Academic Pub., 1995.

ADDITIONAL MATERIAL:

V. Brusoni, L. Console, B. Pernici, P. Terenziani. Qualitative and Quantitative Temporal Constraints and Relational Databases: Theory, Architecture, and Applications. IEEE Transactions on Knowledge and Data Engineering 11(6), 948-968, November/December 1999.

C. E. Dyreson and R. T. Snodgrass, "Supporting Valid-time Indeterminacy", ACM Transactions on Database Systems, 23(1), March 1998, pp. 1-57.

P. Terenziani. Reasoning about time. Encyclopedia of Cognitive Science, ©Macmillan Reference Ltd, Vo.3, pp.869-874, London, 2003.

P. Terenziani, R. Snodgrass. Reconciling Point-based and Interval-based Semantics in Temporal Relational Databases: A Proper Treatment of the Telic/Atelic Distinction. IEEE Transactions on Knowledge and Data Engineering, 16(4), 540-551, 2004.

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=bd03

Temporal Data Bases

Anno accademico:	2013/2014
Codice attività didattica:	TDB2013
Docente:	Prof. Paolo Terenziani (Titolare del corso)
Contatti docente:	<i>paolo.terenziani@unipmn.it</i>
Anno:	1° anno 2° anno 3° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	2
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Italiano
Frequenza:	Obbligatoria
Tipologia esame:	Orale

OBIETTIVI FORMATIVI

The treatment of temporal aspects plays an important role in Databases. Since the 80', researchers have shown that, in order to properly cope with time, new techniques and extensions to the standard DB approaches are needed, motivating the birth of a new area of research: "Temporal Databases". After a brief motivating introduction, the course will survey some of the main results of the area, with a specific focus on relational temporal DBs and their semantics.

RISULTATI DELL'APPRENDIMENTO ATTESI

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TESTI CONSIGLIATI E BIBLIOGRAFIA

MAIN REFERENCE BOOK:

R.T. Snodgrass (editor), I. Ahn, G. Ariav, D. Batory, J. Clifford, C. Dyreson, R. Elmasri, F. Grandi, C. Jensen, W. Käfer, N. Kline, K. Kulkarni, C. Leung, N. Lorentzos, J. Roddick, A. Segev, M. Soo, S.M. Sripada, The Temporal Query Language TSQL2, Kluwer Academic Pub., 1995.

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V. Brusoni, L. Console, B. Pernici, P. Terenziani. Qualitative and Quantitative Temporal Constraints and Relational Databases: Theory, Architecture, and Applications. IEEE Transactions on Knowledge and Data Engineering 11(6), 948-968, November/December 1999.

C. E. Dyreson and R. T. Snodgrass, "Supporting Valid-time Indeterminacy", ACM Transactions on Database Systems, 23(1), March 1998, pp. 1-57.

P. Terenziani. Reasoning about time. Encyclopedia of Cognitive Science, ©Macmillan Reference Ltd, Vo.3, pp.869-874, London, 2003.

P. Terenziani, R. Snodgrass. Reconciling Point-based and Interval-based Semantics in Temporal Relational Databases: A Proper Treatment of the Telic/Atelic Distinction. IEEE Transactions on Knowledge and Data Engineering, 16(4), 540-551, 2004.

Pagina web del corso: <http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?id=7cda>

Temporal Data Bases

Temporal Data Bases

Anno accademico:	2014/2015
Codice attività didattica:	TDB1415
Docente:	Prof. Paolo Terenziani (Titolare del corso)
Contatti docente:	<i>paolo.terenziani@unipmn.it</i>
Anno:	1° anno 2° anno 3° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	2
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Italiano
Frequenza:	Obbligatoria
Tipologia esame:	Orale

OBIETTIVI FORMATIVI

The treatment of temporal aspects plays an important role in Databases. Since the 80', researchers have shown that, in order to properly cope with time, new techniques and extensions to the standard DB approaches are needed, motivating the birth of a new area of research: "Temporal Databases". After a brief motivating introduction, the course will survey some of the main results of the area, with a specific focus on relational temporal DBs and their semantics.

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- (5) Advanced temporal issues (e.g., multiple granularities, telic/atelic data, temporal indeterminacy, temporal constraints and temporal reasoning)

TESTI CONSIGLIATI E BIBLIOGRAFIA

MAIN REFERENCE BOOK:

R.T. Snodgrass (editor), I. Ahn, G. Ariav, D. Batory, J. Clifford, C. Dyreson, R. Elmasri, F. Grandi, C. Jensen, W. Käfer, N. Kline, K. Kulkarni, C. Leung, N. Lorentzos, J. Roddick, A. Segev, M. Soo, S.M. Sripada, The Temporal Query Language TSQL2, Kluwer Academic Pub., 1995.

ADDITIONAL MATERIAL:

V. Brusoni, L. Console, B. Pernici, P. Terenziani. Qualitative and Quantitative Temporal Constraints and Relational Databases: Theory, Architecture, and Applications. IEEE Transactions on Knowledge and Data Engineering 11(6), 948-968, November/December 1999.

C. E. Dyreson and R. T. Snodgrass, "Supporting Valid-time Indeterminacy", ACM Transactions on Database Systems, 23(1), March 1998, pp. 1-57.

P. Terenziani. Reasoning about time. Encyclopedia of Cognitive Science, ©Macmillan Reference Ltd, Vo.3, pp.869-874, London, 2003.

P. Terenziani, R. Snodgrass. Reconciling Point-based and Interval-based Semantics in Temporal Relational Databases: A Proper Treatment of the Telic/Atelic Distinction. IEEE Transactions on Knowledge and Data Engineering, 16(4), 540-551, 2004.

NOTA

The course will be held in February, 2015.

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=xdk8

The Ramifications of Sharing in Data Structures

Anno accademico:	2012/2013
Codice attività didattica:	SEM-RAMSH
Docente:	
Contatti docente:	
Anno:	1° anno 2° anno 3° anno
Tipologia:	Seminario
Crediti/Valenza:	0
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Italiano
Frequenza:	Facoltativa
Tipologia esame:	Non prevista

OBIETTIVI FORMATIVI

Programs manipulating mutable data structures with intrinsic sharing present a challenge for modular verification. Deep aliasing inside data structures dramatically complicates reasoning in isolation over parts of these objects because changes to one part of the structure (say, the left child of a dag node) can affect other parts (the right child or some of its descendants) that may point into it. The result is that finding intuitive and compositional proofs of correctness is usually a struggle. We propose a compositional proof system that enables local reasoning in the presence of sharing.

While the AI "frame problem" elegantly captures the reasoning required to verify programs without sharing, we contend that natural reasoning about programs with sharing instead requires an answer to a different and more challenging AI problem, the "ramification problem": reasoning about the indirect consequences of actions. Accordingly, we present a Ramify proof rule that attacks the ramification problem head-on and show how to reason with it. Our framework is valid in any separation logic and permits sound compositional and local reasoning in the context of both specified and unspecified sharing. This talk will be illustrated by proofs of examples manipulating dags, graphs, and overlaid data structures.

RISULTATI DELL'APPRENDIMENTO ATTESI

The seminar will be held

Jules Villard (<http://www0.cs.ucl.ac.uk/staff/J.Villard/>)

University College London

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=898a

The ULTraS Framework: New Behavioral Equivalences for Nondeterministic and Probabilistic Processes and Their Spectrum

Anno accademico:	2013/2014
Codice attività didattica:	SEM-ULTRAS
Docente:	
Contatti docente:	
Anno:	1° anno 2° anno 3° anno
Tipologia:	Seminario
Crediti/Valenza:	0
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	Facoltativa
Tipologia esame:	Non prevista

OBIETTIVI FORMATIVI

Labeled transition systems are typically used as behavioral models of concurrent processes. Their labeled transitions define a one-step state-to-state reachability relation. This model can be generalized by

modifying the transition relation to associate a state reachability distribution with any pair consisting of a source state and a transition label. The state reachability distribution is a function mapping each possible target state to a value that expresses the degree of one-step reachability of that state. Values are taken from a preordered set equipped with a minimum that denotes unreachability. By selecting suitable preordered sets, the resulting model, called ULTraS from Uniform Labeled TRAnSition System, can be specialized to capture well-known models of fully nondeterministic processes (LTS), fully probabilistic processes (ADTMC), fully stochastic processes (ACTMC), and nondeterministic and probabilistic (MDP) or nondeterministic and stochastic (CTMDP) mixed processes. This uniform treatment of different behavioral models extends to behavioral equivalences. They can be defined on ULTraS by relying on appropriate measure functions that express the degree of reachability of a set of states when performing multi-step computations. It is shown that the specializations of bisimulation, trace, and testing equivalences for the

different classes of ULTraS coincide with the behavioral equivalences defined in the literature over traditional models except when nondeterminism and probability/stochasticity coexist; then new equivalences pop up.

NOTA

The seminar will be held by

prof. Marco Bernardo

Universita' di Urbino

Pagina web del corso: <http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?id=mqpo>

Trust modeling and user modeling to address social network overload through message recommendation

Anno accademico:	2013/2014
Codice attività didattica:	SEM-TMUMA
Docente:	
Contatti docente:	
Anno:	1° anno 2° anno 3° anno
Tipologia:	Seminario
Crediti/Valenza:	0
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	Facoltativa
Tipologia esame:	Non prevista

PROGRAMMA

Abstract

In this talk I present two projects that develop artificial intelligence approaches for assisting users to derive positive experiences in today's current online communities. In particular, our online social networks increasingly have massive numbers of peers and hence very large numbers of potential messages to view. We demonstrate how it is possible to present to users those messages with highest predicted benefit. This is achieved through a combination of techniques from the artificial intelligence subfields of trust modeling and user modeling. The first project focuses on using an approach motivated by POMDPs to learn, in a principled manner, those messages that bring the highest utility to a user, in environments where peers offer ratings of those messages. This is achieved through observations of a message's rating, the similarity of the message rater to the user and the credibility of the message rater. We validate our approach both through simulations and against realworld datasets from Reddit and Epinions. The second project was a hands-on study of a set of existing social networks (Coursera, Reddit and Health Forums) which led to the development of a generalized recommendation algorithm that can operate regardless of social network. This is achieved by careful modeling of the message, the author, the recipient and the network. Our conclusion is that user modeling and trust modeling are both important for effective management of social network information and that artificial intelligence approaches show some promise in assisting users in these online environments.

NOTA

The seminar will be held by

Robin Cohen
David R. Cheriton School of Computer Science
University of Waterloo
Waterloo, Ontario, Canada

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=75vr

Trust modeling and user modeling to address social network overload through message recommendation

Anno accademico:	2014/2015
Codice attività didattica:	SEM-TMUMA
Docente:	
Contatti docente:	
Anno:	1° anno 2° anno 3° anno
Tipologia:	Seminario
Crediti/Valenza:	0
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	Facoltativa
Tipologia esame:	Non prevista

PROGRAMMA

Abstract

In this talk I present two projects that develop artificial intelligence approaches for assisting users to derive positive experiences in today's current online communities. In particular, our online social networks increasingly have massive numbers of peers and hence very large numbers of potential messages to view. We demonstrate how it is possible to present to users those messages with highest predicted benefit. This is achieved through a combination of techniques from the artificial intelligence subfields of trust modeling and user modeling. The first project focuses on using an approach motivated by POMDPs to learn, in a principled manner, those messages that bring the highest utility to a user, in environments where peers offer ratings of those messages. This is achieved through observations of a message's rating, the similarity of the message rater to the user and the credibility of the message rater. We validate our approach both through simulations and against realworld datasets from Reddit and Epinions. The second project was a hands-on study of a set of existing social networks (Coursera, Reddit and Health Forums) which led to the development of a generalized recommendation algorithm that can operate regardless of social network. This is achieved by careful modeling of the message, the author, the recipient and the network. Our conclusion is that user modeling and trust modeling are both important for effective management of social network information and that artificial intelligence approaches show some promise in assisting users in these online environments.

NOTA

The seminar will be held by

Robin Cohen
David R. Cheriton School of Computer Science
University of Waterloo
Waterloo, Ontario, Canada

Pagina web del corso: <http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show? id=3vh4>

Type Inference for Bimorphic Recursion

Anno accademico:	2012/2013
Codice attività didattica:	SEM-TIBD
Docente:	
Contatti docente:	
Anno:	1° anno 2° anno 3° anno
Tipologia:	Seminario
Crediti/Valenza:	0
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	Facoltativa
Tipologia esame:	Non prevista

PROGRAMMA

This talk proposes bimorphic recursion, which is restricted polymorphic recursion such that every recursive call in the body of a function definition has the same type. Bimorphic recursion allows us to assign two different types to a recursively defined function: one is for its recursive calls and the other is for its calls outside its definition. Bimorphic recursion in this talk can be nested. This talk shows bimorphic recursion has principal types and decidable type inference. Hence bimorphic recursion gives us flexible typing for recursion with decidable type inference. This talk also shows that its typability becomes undecidable because of nesting of recursions when one removes the instantiation property from the bimorphic recursion. This is a joint work with Ferruccio Damiani and was presented at Second International Symposium on Games, Automata, Logics, and Formal Verification (GandALF 2011).

NOTA

SEMINAR HELD BY:

Prof. Makoto Tatsuta

(National Institute of Informatics)

Understanding cascades in complex networks with MANCaLog

Understanding cascades in complex networks with MANCaLog

Anno accademico:	2013/2014
Codice attività didattica:	SEM-MANCALOG
Docente:	
Contatti docente:	
Anno:	1° anno 2° anno 3° anno
Tipologia:	Seminario
Crediti/Valenza:	
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	Facoltativa
Tipologia esame:	Non prevista

OBIETTIVI FORMATIVI

Social networks have become ubiquitous in modern life and offer unique opportunities for data mining. In this talk, we look at challenges in mining information from social networks with multiple attributes and where geospatial information must be taken into account.

First, we introduce MANCaLog, a logic-programming framework for understanding cascades in complex networks. We developed this framework by setting up several characteristics we believed such a language should achieve. We then show how our framework meets these requirements yet still determine the outcome of a social network cascade in polynomial time. This work was originally presented at AAMAS-13 and a follow-up paper will appear at ICLP-13.

Next, we look at the problem of finding geospatially disperse communities in a social network. Previous work has shown that most community finding algorithms identify clusters of individuals that are geographically proximate. This is often due to certain biases inherent in a social network. In this work, we show how geospatial information can be discounted in order to find communities that are tightly-knit socially yet geographically disperse. This work will be presented at KDD-13.

Finally, we present the Organizational, Relationship, and Contact Analyzer (ORCA) which uses many social network analysis and mining techniques to aide in police intelligence analysis for combatting gang violence. We describe this piece of software and the challenges in integrating various algorithms in a single package as well as some preliminary results obtained working with our law enforcement partners.

NOTA

Paulo Shakarian is an Assistant Professor at the U.S. Military Academy (West Point, NY) in the Dept. of Electrical Engineering and Computer Science. His research interests include logic programming, abductive inference, social network analysis/mining, applied artificial intelligence, and cyber-warfare. His academic work has appeared in top conferences such as KDD, AAMAS, ESORICS, ASONAM, and ICLP. His work has been featured in The Economist, WIRED, Popular Science, and Nature. He also co-authored the new book Introduction to Cyber-Warfare: A Multidisciplinary Approach. His website is <http://shakarian.net>.

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=xcs0

User Modeling and Adaptive Systems

User Modeling and Adaptive Systems

Anno accademico:	2016/2017
Codice attività didattica:	INF0086
Docente:	Dott. Federica Cena (Titolare del corso) Prof. Cristina Gena (Titolare del corso)
Contatti docente:	+39 011 6706779, cena@di.unito.it
Anno:	1° anno 2° anno 3° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	Facoltativa
Tipologia esame:	Relazione finale

PROGRAMMA

I PART: FUNDAMENTALS

- Introduction to the course: historical overview on user modeling (2h)
- Knowledge representation for user modeling, inference of knowledge (2h)
- Adaptive Hypermedia and Recommender systems (2h)
- Human-computer interaction and evaluation. (4h)

II PART: NEW TRENDS

- Social recommendation (2h)
- Semantic-based user model (2h)
- cross-system recommendation (2h)
- user model interoperability (2h)
- lot-based user modeling (2h)

ORARIO LEZIONI

Giorni	Ore	Aula
Lunedì	10:00 - 12:00	Sala Seminari Dipartimento di Informatica
Martedì	10:00 - 12:00	Sala Seminari Dipartimento di Informatica
Mercoledì	10:00 - 12:00	
Giovedì	10:00 - 12:00	
Venerdì	9:00 - 13:00	
Lunedì	14:00 - 16:00	
Martedì	14:00 - 16:00	
Giovedì	14:00 - 16:00	

Lezioni: dal 25/09/2017 al 29/09/2017

Nota: ORARIO COMPLETO DELLE LEZIONI - SALA SEMINARI

- lunedì 25 settembre

- Lezione 1: (10-12) Introduction to the course: historical overview on user modeling
 - Lezione 2: (14-16) Adaptive Hypermedia and Recommender systems
- martedì 26 settembre
- Lezione 3: (10-12) Human-computer interaction and evaluation 1/2.
 - Lezione 4: (14-16) Human-computer interaction and evaluation 2/2.
- mercoledì 27 settembre
- Lezione 5: - (10-12) Knowledge representation for user modeling
 - Lezione 6: 14-16 Semantic-based user model
- giovedì 28 settembre
- Lezione 7: (10-12): user model interoperability
 - Lezione 8: (14-16) Social recommendations
- venerdì 29 settembre
- Lezione 9: (9-11) lot-based user modeling
 - Lezione 10: (11-13) cross-system recommendation

Pagina web del corso: http://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=kydb

User Modeling and Adaptive Systems

User Modeling and Adaptive Systems

Anno accademico:	2017/2018
Codice attività didattica:	INF0086-2
Docente:	Dott. Federica Cena (Titolare del corso) Prof. Cristina Gena (Titolare del corso)
Contatti docente:	+39 011 6706779, cena@di.unito.it
Anno:	1° anno 2° anno 3° anno
Tipologia:	A scelta dello studente
Crediti/Valenza:	
SSD attività didattica:	INF/01 - informatica
Erogazione:	Tradizionale
Lingua:	Inglese
Frequenza:	Facoltativa
Tipologia esame:	Relazione finale

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