CILC08 23-esimo Convegno Italiano di Logica Computazionale

Dipartimento di Matematica e Informatica
Università di Perugia
Perugia, 10-12 Luglio 2008

ABSTRACT DEI CONTRIBUTI

Parallel Execution of Logic Programs: Back to the Future (Relazione invitata)

Relatore: Enrico Pontelli

Abstract: Since its inception, logic programming has offered the promise of transparent and automated exploitation of parallelism. This promise is now matched by the reality of ubiquitous availability of parallel hardware, ranging from large scale Beowulf clusters to extremly fine-grained multi-threaded engines (as found in modern graphic cards). In this presentation, we will review the main results produced by 20+ years of research in the field of parallel execution of logic programs. We will highlight the state of the art, the lessons learned, and the mistakes made. We will conclude with the identification of focus areas of research and current new directions being explored.

Aggregates in Answer Set Programming (Relazione invitata)

Relatore: Wolfgang Faber

Abstract: The addition of aggregates has been one of the most relevant enhancements of the language of answer set programming (ASP), strengthening the modelling power of ASP in terms of natural and concise problem representations. While in traditional database systems these constructs have a long tradition and are nowadays taken for granted, they are a comparatively recent addition to ASP. One of the reasons is that because of the possibility of recursive definitions, the intended semantics is not always straightforward to understand, let alone to define. Previous semantic definitions typically agree in the case of nonrecursive aggregates, but subtly vary for aggregates involved in recursion. In this talk, we provide an overview of this field and discuss various semantic and computational properties.

System Biology: Models and Logics (Tutorial)

Relatrice: Carla Piazza

Abstract: The field of system biology focuses on creating a finely detailed picture of biological mechanisms. Recently, the need has arisen for more and more sophisticated and mathematically well founded computational tools capable of analyzing the models that are and will be at the core of system biology. Such computational models should be implemented in software packages faithfully while exploiting the potential trade-offs among usability, accuracy, and scalability dealing with large amounts of data. The aim of this talk is that of introducing some emerging problems and proposed solutions in this context.

GASP: Answer Set Programming with Lazy Grounding

Autori: Alessandro Dal Palù, Agostino Dovier, Enrico Pontelli e Gianfranco Rossi

Abstract: In this paper we present a novel methodology to compute stable models in Answer Set Programming. The process is performed with a bottom-up approach that does not require the preprocessing of the typical grounding phase. The implementation is completely in Prolog and Constraint Logic Programming over finite domains. The code is very simple and can be used for didactic purposes.

A Refined Calculus for Intuitionistic Propositional Logic

Autori: Mauro Ferrari, Camillo Fiorentini e Guido Fiorino

Abstract: Since 1993, when Hudelmaier developed a $O(n \log\ n)$-space decision procedure for propositional intuitionistic logic, a lot of work has been done to improve the efficiency of the related proof-search algorithms. This has been done working on proof-search strategies and on implementation structures more than on logical properties of the calculi. In this paper we provide a tableau calculus using the signs T, F and Fc, with a new set of rules to treat signed formulas of the kind $T(A \to B) \to C)$. The main feature of the calculus is to reduce both the non-determinism in proof-search and the width of proofs with respect to Hudelmaier's one. The new rules come out from a deep semantic analysis of nested implications and their behavior in the counter-model construction.

The Decidability of the Bernays-Schoenfinkel-Ramsey Class for Set Theory

Autori: Eugenio Omodeo e Alberto Policriti

Abstract: As is well-known, the Bernays-Scoenfinkel-Ramsey class of all prenex forall*exists*-sentences which are provable in first-order predicate calculus is decidable. This paper shows that an analogous result holds when the only available predicate symbols designate membership and equality, no constants or function symbols are available, and one moves inside a (rather generic) set theory whose axioms yield the well-foundedness of membership and the existence of infinite sets.

A Graphical Representation of Relational Formulae with Complementation

Autori: Domenico Cantone, Andrea Formisano, Marianna Nicolosi Asmundo e Eugenio Omodeo

Abstract: We improve existing techniques for graphical representation of relational expressions and for translating them into dyadic first-order logic. The enhanced technique can cope with the relational complement construct and the negation connective.

Complementation is handled by adopting a Smullyan-like uniform notation to classify and decompose map expressions, whereas negation is treated by generalizing the notion of graph for a formula in $\mathcal{L}^+$ and by introducing a series of graph transformation rules which reflect the meaning of the connectives and quantifiers occurring in the formula.

Graded CTL Model Checking

Autori: Alessandro Ferrante, Margherita Napoli e Mimmo Parente

Abstract: The use of the universal and existential quantifiers with the capability to express the concept of *at least k* or *all but k*, for a non negative integer k, has always been thoroughly studied in various kinds of logics. In classical logic there are *counting quantifiers*, in modal logics *graded modalities*, in description logics *number restrictions*.

Recently, the complexity issues related to the decidability of the μ–calculus, when the universal and existential quantifiers are augmented with graded modalities, have been investigated by Kupfermann, Sattler and Vardi. They have shown that this problem is ExpTime–complete.

In this paper we consider another extension of modal logic, the Computational Tree Logic *CTL*, augmented with graded modalities generalizing standard quantifiers and investigate the complexity issues, with respect to the model–checking problem. We consider a system model represented by a pointed Kripke structure K and give an algorithm to solve the model–checking problem running in time $O(|K| \cdot |\varphi|)$ which is hence tight for the problem (where $|\varphi|$ is the number of temporal and boolean operators and does not include the values occurring in the graded modalities).

In this framework, the graded modalities express the ability to generate a user–defined number of counterexamples (or evidences) to a specification φ given in CTL. However these multiple counterexamples can partially overlap, that is they may share some behavior. We have hence investigated the case when all of them are completely disjoint. In this case we prove that the model–checking problem is both NP–hard and coNP–hard and give an algorithm for solving it running in polynomial space. We have thus studied a fragment of this graded–CTL logic, and have proved that in this case the model–checking problem is solvable in polynomial time.

Eliciting Multi-Dimensional Relational Patterns

Autori: Nicola Di Mauro, Teresa Basile, Stefano Ferilli e Floriana Esposito

Abstract: Here the issue of discovery of frequent multi-dimensional patterns from relational sequences is addressed. The great variety of applications of sequential pattern mining makes this problem one of the central topics in data mining. Nevertheless, sequential information may concern data on multiple dimensions and, hence, the mining of sequential patterns from multi-dimensional information results very important. This work takes into account the possibility to mine complex patterns, expressed in a first-order language, in which events may occur along different dimensions. Specifically, multi-dimensional patterns are defined as a set of atomic first-order formulae in which events are explicitly represented by a variable and the relations between events are represented by a set of dimensional predicates. A complete framework and a Relational Learning algorithm to tackle this problem is presented along with some experiments on artificial and real multi-dimensional sequences.

Semantically Augmented DCG Analysis for Next-generation Search Engines

Autori: Stefania Costantini e Alessio Paolucci

Abstract: In this paper, we describe an extension to the well-known DCGs (Definite Clause Grammars) to allow for semantic analysis, and generate semantically-based description of the sentence at hand. This approach has been the basis for the development of a new search engine called Mnemosine, which is able to interact with a user in natural language and to provide contextual answer at different levels of detail. Mnemosine has been fully implemented and has been applied to a practical case-study, i.e., to the WikiPedia Web pages. The Mnemosine system, though still a prototype, exhibits features which are more advanced than those of the (few) existing competitors and thus represents a successful proof-of-concept for the proposed approach.

Experimenting with Stochastic Prolog as a Simulation Language

Autori: Enrico Oliva, Luca Gardelli, Mirko Viroli e Andrea Omicini

Abstract: While simulation is an established tool for scientific analysis, it is recently gaining more interest also in other contexts, such as software engineering. Hence, more and more attention is devoted to the development of suitable simulation languages (and tools), and their exploitation in application development and run-time can become increasingly pervasive. As already experienced in the context of general-purpose programming languages, we envision future developments towards expressiveness, with performance issues becoming less and less relevant. Along this direction, we propose a preliminary stochastic simulation framework developed on top of a logic programming language, called Stochastic Prolog: this framework allows us to run simulations directly from Prolog-based specifications. Our objective, in this work, is to put the basis for future research on logic stochastic language used for simulation purpose. In our approach

Prolog clauses can be labelled with rates modelling temporal/probabilistic aspects. The main advantage of using Prolog is that it is significantly more expressive than other languages typically used in simulation, allowing to more easily encode complex specifications. In order to evaluate our framework, we compare it with the stochastic language defined by the PRISM tool, by discussing as case study the collective sorting problem, a decentralised sorting strategy for multiagent systems (MAS) inspired by behaviours observed in social insects.

Hybrid Automata in System Biology: How far can we go?

Autori: Dario Campagna e Carla Piazza

Abstract: We consider the reachability problem on semi-algebraic hybrid automata. In particular, we deal with the effective cost that has to be afforded to solve reachability through first-order satisfiability.

The analysis we perform with some existing tools shows that even simple examples cannot be efficiently solved. We need approximations to reduce the number of variables in our formulae: this is the main source of time computation growth. We study standard approximation methods based on Taylor polynomials and ad-hoc strategies to solve the problem and we show their effectiveness on the repressilator case study.

External Point of View in Process Algebra for System Biology (breve)

Autori: Filippo Del Tedesco e Carla Piazza

Abstract: A critical aspect in the modeling of biological systems is the description view point. On the one hand, the Stochastic pi-calculus formalism provides an intuitive and compact representation from an internal perspective. On the other hand, other proposed languages such as Hybrid Automata and Stochastic Concurrent Constraint Programming introduce in the system description an external control and provide more structured models.

This work aims at bridging the above discussed gap. In particular, we propose a different approach for the encoding of biological systems in Stochastic pi-calculus in the direction of introducing the above mentioned external control. We show the effectiveness of our method on some biochemical examples.

Proof Methods for Conditional and Preferential Logics of Nonmonotonic Reasoning (breve)

Autori: Gian Luca Pozzato

Abstract: Conditional and Preferential Logics have been applied in order to formalize nonmonotonic reasoning. In spite of their significance, very few proof methods have been proposed for these logics. In my PhD thesis, whose content is summarized in this paper, I have tried to partially overwhelm this gap, by introducing sequent and tableau calculi for Conditional and Preferential Logics.

Social Bugs Communities and Intelligent Agents: an Experimental Architecture (breve)

Autori: Stefania Costantini, Arianna Tocchio e Mario Scotti Del Greco

Abstract: In this paper, we present an architecture composed of agents equipped with different degrees of intelligence and we experiment how the distribution of intelligence can influence the global behavior of a community of agents. The architecture integrates DALI agents and IBM Aglets, two platforms that differ both in technology and in capabilities. As a case-study and experimentation scenario, we have interpreted our architecture as an artificial beehive and we have modeled some of the possible behaviors of the bees.

Compliance Checking of Execution Traces to Business Rules: an Approach Based on LP

Autori: Marco Montali, Paola Mello, Federico Chesani, Fabrizio Riguzzi, Sergio Storari e Maurizio Sebastianis

Abstract: Complex and flexible business processes are critical not only because they are difficult to handle, but also because they often tend to be less intelligible. Monitoring and verifying complex and flexible processes becomes therefore a fundamental requirement. We propose a framework for performing compliance checking of process execution traces w.r.t. expressive reactive business rules, tailored to the MXML meta-model. Rules are mapped onto (extensions of) Logic Programming, to the aim of providing both monitoring and a-posteriori verification capabilities. We show how different rule templates, inspired by the ConDec language, can be easily specified and then customized in the context of a real industrial case study. We finally describe how the proposed language and its underlying a-posteriori reasoning technique have been concretely implemented as a ProM analysis plug-in.

A Nonmonotonic Soft Concurrent Constraint Language for SLA Negotiation

Autori: Stefano Bistarelli e Francesco Santini

Abstract: We present an extension of the Soft Concurrent Constraint language that allows the nonmonotonic evolution of the constraint store. To accomplish this, we introduce some new operations: the retract(c) reduces the current store by c, the updateX(c) transactionally relaxes all the constraints of the store that deal with the variables in the set X, and then adds a constraint c; the nask(c) tests if c is not entailed by the store. We present this framework as a possible solution to the management of resources (e.g. web services and network resource allocation) that need a given Quality of Service (QoS). The QoS requirements of all the parties should converge, through a negotiation process, on a formal agreement defined as the Service Level Agreement, which specifies the contract that must be enforced. c-semirings are the algebraic structures that we use to model QoS metrics.

Compiling and Executing Declarative Modeling Languages in Gecode

Autori: Agostino Dovier, Raffaele Cipriano e Jacopo Mauro

Abstract: We developed a compiler from SICStus Prolog CLP(FD) to Gecode as well as a compiler from MiniZinc to Gecode. We compared the running times of the executions of (standard) codes directly written in the three languages and of the compiled codes for a series of classical problems. Performances of the compiled codes in Gecode improve those in the original languages and are comparable with running time of native Gecode code. This is a first step towards the definition of a unified declarative modeling language for combinatorial problems that will allow the user to define problem instances and solving meta-algorithms using high-level declarative language, and then to automatically translate the specification into a low-level encoding, that allows the solving algorithms to run efficiently.

Generalizing Finite Domain Constraint Solving

Autori: Federico Bergenti, Alessandro Dal Palù e Gianfranco Rossi

Abstract: This paper summarizes a constraint solving technique that can be used to reason effectively in the scope of a constraint language that supersedes common finite domain languages available in the litera- ture. The first part of this paper motivates the presented work and in- troduces the constraint language, namely Hereditarily Finite Sets (HFS) language. Then, the proposed constraint solver is detailed in terms of a set of rewrite rules which exploit finite domain reasoning within the HFS language. The presented approach achieves good efficiency with no loss of desired correctness and completeness that other solvers for HFS provide.

Folding Transformation Rules for Constraint Logic Programs

Autori: Valerio Senni, Alberto Pettorossi e Maurizio Proietti

Abstract: We consider the folding transformation rule for constraint logic programs. We propose an algorithm for applying the folding rule in the case where the constraints are linear equations and inequations over the rational or the real numbers. Basically, our algorithm consists in reducing a rule application to the solution of one or more systems of linear equations and inequations. We also introduce two variants of the folding transformation rule. The rst variant combines the folding rule with the clause splitting rule, and the second variant eliminates the existential variables of a clause, that is, those variables which occur in the body of the clause and not in its head. Finally, we present the algorithms for applying these variants of the folding rule.

Lifting Databases to Ontologies

Autori: Gisella Bennardo, Giovanni Grasso, Salvatore Maria Ielpa, Nicola Leone e Francesco Ricca

Abstract: Nowadays it is widely recognized that ontologies are a fundamental tool for knowledge representation and reasoning; and, in particular, they have been recently exploited for setting out business enterprise information (obtaining the so-called *enterprise/corporate ontologies*). Enterprise ontologies offer a clean view of the enterprise knowledge, simplifying the retrieval of information and the discovery of new knowledge through powerful reasoning mechanisms.

However, enterprise ontologies are not widely used yet, mainly because of two major obstacles: (*i*) the specification of a real-world enterprise ontology is an hard task, developing an enterprise ontology by scratch would be a time-consuming and expensive task; and, (*ii*) usually, enterprises already store their relevant information in large database systems, and do not want to load the information again in the ontologies; moreover, these databases have to keep their autonomy since many applications work on them.

In this paper we propose a solution that combines the advantages of an ontology representation language (i.e., high expressive power and clean representation of data) having powerful reasoning capabilities, with the capability to efficiently exploit a large (and, often already existent) enterprise database. In particular, we allow to "lift" an existing database to an ontology. The database is kept and the existing applications can still work on it, but the user can take profit of the new ontological view of the data, and exploit powerful reasoning mechanisms for consistency checking, knowledge discovery, and other advanced knowledge-based tasks.

Compiling Minimum and Maximum Aggregates into Standard ASP

Autori: Mario Alviano, Wolfgang Faber e Nicola Leone

Abstract: The introduction of aggregate functions in answer set programming (ASP) allows for representing many problems in a succinct way. The possibility to encode aggregate functions with the constructs of standard ASP results from previous studies about the complexity of answer set programming with aggregates ($\text{ASP}^{\mathcal{A}}$). In this paper, possibilities for encoding minimum and maximum aggregates are analyzed. The straightforward encoding, which has also been proposed in the literature, is shown to be inappropriate in the presence of recursive aggregates. As a remedy, a new encoding is proposed, the adequacy of which is formally proved.

Normal Form Nested Programs

Autori: Annamaria Bria, Wolfgang Faber e Nicola Leone

Abstract: Disjunctive logic programming under the answer set semantics (DLP, ASP) has been acknowledged as a versatile formalism for knowledge representation and reasoning

during the last decade. Lifschitz, Tang, and Turner have introduced an extended language of DLP, called Nested Logic Programming (NLP), in 1999. It often allows for more concise representations by permitting a richer syntax in rule heads and bodies. However, that language is propositional and thus does not allow for variables, one of the strengths of DLP.

In this paper, we introduce a language similar to NLP, called Normal Form Nested (NFN) programs, which does allow for variables, and present the syntax and semantics. The presence of variables, however, gives rise to potential problems, such as the lack of domain independence. We study these issues in depth and define the class of safe NFN programs, which are guaranteed to be domain independent. Moreover, we show that for NFN programs which are also NLPs, our semantics coincides with the one of Lifschitz, Tang, and Turner. Finally, we provide an algorithm which translates NFN programs into DLP programs, and does so in an efficient way.

Increasing Parallelism while Instantiating ASP Programs (breve)

Autori: Francesco Calimeri, Simona Perri e Francesco Ricca

Abstract: One of the most hard tasks performed by Answer Set Programming (ASP) systems, especially when dealing with real-world applications and huge input data, is instantiation, which consists of generating variable-free programs equivalent to those given as input. We have already proposed a new strategy for the parallel instantiation of ASP programs, that confirmed to be effective, especially when dealing with programs made of many rules. In this work we present some ideas about a strategy for rewriting programs in such a way that the existing technique can be better exploited in case of programs consisting of few rules.

A Java Wrapper for Answer Set Programming Inferential Engines (breve)

Autori: Giovanni Pirrotta e Alessandro Provetti

Abstract: Most answer set programming inferential engines do not give much support to integration with Object-oriented software applications written in e.g., C++ and Java and cannot be easily integrated in any other external program. This work tries to overcome the above problem by the implementation in Java of a wrapper that supports several use cases. The new JASPWrapper for inferential engines is presented and its usage and advantages are described in detail. The Wrapper consist of a Java library, to be included in larger projects, that offers a uniform interface to several inferential engines for Answer Set Programming.

Towards Introducing Types in DLV* (breve)

Autori: Mario Ornaghi, Camillo Fiorentini e Alberto Momigliano

Abstract: This short paper reports work in progress towards the introduction of static type-checking in DLV*, an extension of DLV with function symbols.

ALC+T: Reasoning About Typicality in Description Logics

Autori: Laura Giordano, Valentina Gliozzi, Nicola Olivetti e Gian Luca Pozzato

Abstract: We extend the Description Logic ALC with a "typicality" operator T that allows us to reason about the prototypical properties and inheritance with exceptions. The resulting logic is called ALC+T. The typicality operator is intended to select the "most normal" or "most typical" instances of a concept. In our framework, knowledge bases may then contain, in addition to ordinary ABoxes and TBoxes, subsumption relations of the form "T(C) is subsumed by P", expressing that typical C-members have the property P. The semantics of a typicality operator is defined by a set of postulates that are strongly related to Kraus-Lehmann-Magidor axioms of preferential logic P. We first show that T enjoys a simple semantics provided by ordinary structures equipped by a preference relation. This allows us to obtain a modal interpretation of the typicality operator. Using such a modal interpretation, we present a tableau calculus for deciding satisfiability of ALC+T knowledge bases. Our calculus gives a nondeterministic-exponential time decision procedure for satisfiability of ALC+T. We then extend ALC+T knowledge bases by a nonmonotonic completion that allows inferring defeasible properties of specific concept instances.

Actions Over a Constructive Semantics for Description Logics

Autori: Loris Bozzato, Mauro Ferrari e Paola Villa

Abstract: Following the approaches and motivations given in recent works about action languages over description logics, we propose an action formalism based on a constructive semantics for ALC. We address the problems to determine executability of an action, to build the state obtained by an action application and to check its consistency: we present an algorithm to solve the latter two problems.

Modeling and Selecting Countermeasures using CP-nets and Answer Set Programming

Autori: Stefano Bistarelli, Fabio Fioravanti, Pamela Peretti e Irina Trubitsyna

Abstract: In this paper, we present CP-defense trees for modeling security scenarios and for expressing qualitative preferences over attacks and countermeasures, and we show how to select the set of preferred countermeasures able to protect a system by translating CP-defense trees to Answer Set Optimization programs.

Defense trees are used to represent attack and defense strategies in security scenarios; the aim in such scenarios is to select the best set of countermeasures which have to

be applied to stop all the vulnerabilities. In order to allow security ocers to express qualitative preferences over the relative hazardousness of attacks, and over the possible countermeasures for a given attack, we enrich defense trees with Conditional Preferences networks (CP-networks), thereby obtaining a new structure called CP-defense trees.

We then provide a method for translating a CP-defense tree, which contains preferences among attacks and countermeasures, to an Answer Set Optimization program. By computing the optimal answer set of the ASO program corresponding to the CP-defense tree we are able to automatically select the set of preferred countermeasure able to mitigate all the vulnerabilities in the modeled security scenario.

Experimental comparison of two tableau-based decision procedures for MLSS

Autori: Domenico Cantone, Pietro Ursino e Rosario Terranova

Abstract: We report the experimental results relative to two tableau-based decision procedures for the fragment **MLSS** of set theory. Efficient implementations of a decision procedure for **MLSS** are particularly relevant for the proof-verifier ÆtnaNova/Referee, which uses it as its main inference rule.

Modeling Preferences on Resource Consumption and Production in ASP

Autori: Stefania Costantini e Andrea Formisano

Abstract: Recently we have proposed RASP, an extension of Answer Set Programming that permits declarative specification and reasoning on consumption and production of resources. Resources are modeled by introducing amount-atoms, involving quantities that represent the available amount of resources. Processes that use resources are easily described through program rules and solutions correspond to different possible allocations of available resources.

In this paper, we extend this framework to allow the declarative specification of preferences among alternative use of different resources.

We provide semantics for the resulting system and sketch a possible implementation based on standard ASP-solvers. The implementation consists of a standard translation of each rule into a set of plain ASP rules and of an inference engine that manages the firing of rules, the allocation of resources, the satisfaction of user constraints on resource usage. The preferences expressed on resource usage induce a preference order on answer sets. In this initial implementation, such an order is rendered through optimization features provided by standard ASP-solvers.

Elenco degli autori

Agostino Dovier	dovier@dimi.uniud.it	Univ. di Udine
Alberto Momigliano	amomigl1@inf.ed.ac.uk	LFCS, Univ. of Edinburgh
Alberto Pettorossi	pettorossi@disp.uniroma2.it	Univ. of Roma Tor Vergata
Alberto Policriti	policriti@dimi.uniud.it	Univ. of Udine
Alessandro Dal Palù	alessandro.dalpalu@unipr.it	Univ. of Parma
Alessandro Ferrante	ferrante@dia.unisa.it	Univ. di Salerno
Alessandro Provetti	ale@unime.it	Univ. of Messina
Alessio Paolucci	paoluccialessio@alice.it	Univ. di L'Aquila
Andrea Formisano	formis@dipmat.unipg.it	Univ. di Perugia
Andrea Omicini	andrea.omicini@unibo.it	Univ. di Bologna
Annamaria Bria	a.bria@mat.unical.it	Univ. della Calabria
Arianna Tocchio	tocchio@di.univaq.it	Univ. di L'Aquila
Camillo Fiorentini	fiorenti@dsi.unimi.it	Univ. di Milano
Carla Piazza	piazza@dimi.uniud.it	Univ. of Udine
Dario Campagna	campagnadario@alice.it	Univ. of Udine
Domenico Cantone	cantone@dmi.unict.it	Univ. of Catania
Enrico Oliva	enrico.oliva@unibo.it	Univ. of Bologna
Enrico Pontelli	epontell@cs.nmsu.edu	New Mexico State University
Eugenio Omodeo	eomodeo@units.it	Univ. of Trieste
Fabio Fioravanti	fioravanti@sci.unich.it	Univ. of Chieti-Pescara
Fabrizio Riguzzi	fabrizio.riguzzi@unife.it	Univ. of Ferrara
Federico Bergenti	federico.bergenti@unipr.it	Univ. of Parma
Federico Chesani	federico.chesani@unibo.it	Univ. of Bologna
Filippo Del Tedesco	pippodt@libero.it	Univ. of Udine
Floriana Esposito	esposito@di.uniba.it	Univ. di Bari
Francesco Calimeri	calimeri@mat.unical.it	Univ. of Calabria
Francesco Ricca	ricca@mat.unical.it	Univ. della Calabria
Francesco Santini	francesco.santini@iit.cnr.it	IMT, IIT, CNR
Gianfranco Rossi	gianfranco.rossi@unipr.it	Univ. di Parma
Gian Luca Pozzato	pozzato@di.unito.it	Univ. di Torino
Giovanni Grasso	giovannigrasso@gmail.com	Univ. della Calabria
Giovanni Pirrotta	gpirrotta@unime.it	Univ. di Messina
Gisella Bennardo	gisella_bennardo@yahoo.it	Univ. della Calabria
Grazia Bombini	gbombini@di.uniba.it	Univ. di Bari
Guido Fiorino	guido.fiorino@unimib.it	Univ. Milano-Bicocca
Irina Trubitsyna	irina@deis.unical.it	Univ. of Calabria
Jacopo Mauro	cumpitar@gmail.com	Univ. of Udine
Laura Giordano	laura@mfn.unipmn.it	Univ. del Piemonte Orientale
Loris Bozzato	loris.bozzato@uninsubria.it	Univ. dell'Insubria
Luca Gardelli	luca.gardelli@unibo.it	Univ. of Bologna
Marco Montali	marco.montali@unibo.it	Univ. of Bologna
Margherita Napoli	napoli@dia.unisa.it	Univ. di Salerno
Marianna Nicolosi Asmundo	nicolosi@dmi.unict.it	Univ. of Catania
Mario Alviano	alviano@mat.unical.it	Univ. of Calabria
Mario Ornaghi	ornaghi@dsi.unimi.it	Univ. di Milano
Mario Scotti Del Greco	mariosdg@gmail.com	Univ. of L'Aquila

Maurizio Proietti	proietti@iasi.cnr.it	IASI-CNR
Maurizio Sebastianis	maurizio.sebastianis@think3.com	think3 Inc., Bologna
Mauro Ferrari	mauro.ferrari@uninsubria.it	Univ. dell'Insubria.
Mimmo Parente	parente@unisa.it	Univ. di Salerno
Mirko Viroli	mviroli@deis.unibo.it	Univ. di Bologna
Nicola Di Mauro	ndm@di.uniba.it	Univ. di Bari
Nicola Leone	leone@unical.it	Univ. of Calabria
Nicola Olivetti	nicola.olivetti@univ-cezanne.fr	Univ. Paul Cezanne (Aix-Marseille 3)
Pamela Peretti	peretti@sci.unich.it	Univ. di Pescara
Paola Mello	pmello@deis.unibo.it	Univ. of Bologna
Paola Villa	paola.villa@uninsubria.it	Univ. dell'Insubria
Pietro Ursino	ursino@dmi.unict.it	Univ. of Catania
Raffaele Cipriano	cipriano@dimi.uniud.it	Univ. of Udine
Rosario Terranova	trunks@videobank.it	Univ. of Catania
Salvatore Maria Ielpa	s.ielpa@mat.unical.it	Univ. of Calabria
Sergio Storari	strsrg@unife.it	Univ. of Ferrara
Simona Perri	perri@mat.unical.it	Univ. of Calabria
Stefania Costantini	stefcost@di.univaq.it	Univ. di L'Aquila
Stefano Bistarelli	bista@sci.unich.it	Univ. di Pescara and CNR
Stefano Ferilli	ferilli@di.uniba.it	Univ. di Bari
Teresa Basile	basile@di.uniba.it	Univ. di Bari
Valentina Gliozzi	gliozzi@di.unito.it	Univ. di Torino
Valerio Senni	senni@disp.uniroma2.it	Univ. of Roma Tor Vergata
Wolfgang Faber	wf@wfaber.com	Univ. of Calabria