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In this issue

Editorial

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This is the first issue of the CologNet Newsletter, the official newsletter of the Network of Excellence in Computational Logic (CoLogNet). The main purpose of the newsletter is to report on the activities of the network and more generally on the international developments in the scientific field of computational logic. The newsletter will aim to report on the network's activities and other related events and present short popular−style reviews of specific sub−areas of computational logic and cases of industrial application.

This first issue includes interesting and different types of contributions. You will find for example survey articles on particular areas of computational logic, and reports of recent international meetings in the area, e.g. the Amsterdam Colloquium 2001 and the ESSLLI summer schools where students and researchers meet and discuss about different topics in the interdisciplinary study of Logic, Language and Information. Short articles on scientific developments include an article on component technology and its role in computational logic and an article on formal methods and their application in software engineering for the development of complex software solutions. Finally the newsletter provides calendar information about upcoming events related to the network.

We would like to thank all the contributors for helping us put together this first issue of the newsletter. We hope that with the support of the network members and the community at large we will be able to continue improving the newsletter in the future.

Executive council report

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Introduction

The CoLogNET project commenced in due time on 01/01/02 with the signature of the Commission. The Network of Excellence in Computation Logic follows a long tradition of EU funded projects in the field of computational logic and its main objective is to bridge gaps between different research and industrial interests in the world of computer science and artificial intelligence. CoLogNET has been established to address all the main centres of excellence in the field, the major players, scientific and industrial, and to provide a unifying framework for promoting and developing computational logic, supporting cross−fertilisation by encouraging co−operation with other NoE.

The Network and its Structure

CoLogNET is organised around nine major areas each headed by its area leader. The consortium consists of 13 leading European research groups in the field of computational logic. This comprises the network coordinator, the 9 area chairs and 5 contributors (AgentLink, ELSNET, ESSLLI, NoE EUNITE, GULP) to work packages. The overall task of the NoE is to follow the overall objective to promote the area of computational logic as a discipline on its own merit. The tasks are clustered around 14 work packages each headed by the work package leader automatically responsible for reporting, fulfilling and monitoring the WP related tasks and deliverables.

Kick−off Phase

The kick−off meeting was hosted by Prof. Dov Gabbay at the Kings College on 21st and 22nd of February 2002 in London. All partners as well as the EU project officer Ralph Dum and David Pearce followed the invitation to establish long lasting, efficient and fruitful working relationships. Presentations were submitted by each partner to give a short introduction of his/her institute/department, research interests and his/her involvement in a specific area/task force and work package. Vivid and fierce discussions on the different means and planned activities / measurements only confirmed the intended mission of the NoE to promote the area of computational logic as an academic discipline. Ways to further promote this message were discussed and the general conclusion was that the emphasis should be put on the scientific impetus various areas could receive from a logic−based approach as opposed to a purely applications−driven approach. Not only was the London meeting crowned with success it also held a special surprise for us and provided the group with some "height" lights such as the London Eye and a riverside dinner.

Task Force Initiatives

During the kick−off meeting in London a series of 3 Task Forces was set−up with the aim of planning and coordinating activities in three key domains. Two TFs mainly deal with industrial relations and technology transfer. TF1 main interest is to create a link between formal methods and industry whereas TF2 is primarily interested in establishing good working relationships between (constraint) logic programming and industry. TF3 will coordinate activities related to EU enlargement. The two general chairs will concentrate on coordinating the link to the International Federation of Computational Logic, IFCoLog.

In the framework of the first Task Force Initiative, a TF 1 and TF 2 reunion was held on 17th April 2002 at the DFKI in Saarbrücken. The principal and underlying goal was to draw up a solid work plan and to define working procedures. It was concluded to target major events in related areas of formal methods and

constraint logic programming and to co−locate CoLogNET promoting events with targeted events. On 25th July 2002 Dines Bjørner as one of the TF participants is organising with the support of CoLogNET a joint industrial day between the Network and FME at FloC'02.

Francesca Rossi −also a pro−activist in TF activities − will be responsible for organising a panel on industrial relations in an ECAI workshop on 23rd July 2002. On 20th September 2002 an industrial event at SAS LOPSTR will be joined with a CoLogNET workshop. Actions such attracting industrial members, providing publicity for CoLogNET, mailing and discussion lists, drawing up a questionnaire, providing an industrial column in the newsletter as well as having a section on the main website devoted to industry for information exchange shall be followed throughout the project life time.

The second Task Force Initiative devoted to EU enlargement was organised in Cyprus. The TF3 meeting proofed to be also a very productive, successful and enjoyable one. The outcome −a precise plan of action− with the call for active participation and strong support of all NoE members is already being in progress. Within TF3 the principal objective is to attract an exhaustive number of scientists and institutions form non−EU countries. According to this definition this includes Associated States having the same rights and thus capable of receiving Community funds and Third States allowed to participate without Community funding. However, there are also chances for this category of exceptionally receiving Community funding when duly justified as being essential for achieving the overall objective of the project. The main aim is to reach a position where, by the next meeting of the EC, on 14th October 2002, a number of specific applications for membership by the non−EU institutions have been submitted to CoLogNET and can be decided upon at the Madrid meeting.

Since FloC'02 is one of the major events in the IT field the conclusion was reached to use FloC'02 as a platform to trigger of actions in form of a CoLogNET awareness launching on EU enlargement. For this reason the consortium was asked to identify key focal institutions in non−EU countries. In addition already registered participant's at FloC'02 will be contacted via a selection procedure of the registration office. Identified research fellows will be invited to take part in the CoLogNET awareness launching. At this point it must be mentioned that we only received very little feedback −even after repeated calls for sending in identified contacts in non−EU countries. A follow−up report on the awareness launching on EU enlargement will be distributed afterwards.

A general Task Force Meeting to review initiatives as well as working procedures and to come up with further actions will be held at the Madrid meeting in October 2002.

Communication Platform and electronic infrastructure

As foreseen in Annex I of the contract, a subcontract was concluded to establish, maintain and update a project website for CoLogNET. This website will not only serve as dissemination tool to the broad public and the scientific community but will also provide additional functionalities to support communication and project management with the consortium. The site can be found at www.colognet.org. This website will be extended to a more exhaustive internet portal in the area of computational logic −as already discussed during the London meeting. There are several new developments taking place at the time of writing. You have access to the mailings list and internal communication infrastructure via the restricted area provided on the main web.

Membership and Contacts

Membership in CologNet (ie as a network node) is open to European groups who are active either in any of the sub−areas of computational logic or in related fields using logic−based methods and who support the goals and objectives of the network. Groups may be industrial or commercial companies or their departments, public and private research centres and also departments or research groups within universities.

The following groups / contacts have already been invited:

1. Leszek Pacholski, U Wroclaw, Institytut Informatyki, Wrocaw, Poland (to be an active node in the Area Automated Reasoning)
2. Buszkowski group, Poznam, Poland (active in the area Logic and NLP)
3. Prof. Dr. Hrant B. Marandjian, Institute of Programming Armenian Academy of Science, Armenia
4. Dr. Dimitar Guelev, Institute of Mathematics and Informatics, Bulgarian Academy of Science, Bulgaria
5. Prof. Dr. Jan P. Barzdin, Latvian State Univ. P. Stucka, Riga, Latvia
6. Prof. Dr. Andrezj Broszyskowski, Institute of Computer Science, Polish Academy of Science, Gdansk
7. Prof. Dr. Nikolaj S. Nikitchenko, Taras Shevchenho University of Kyiv, Facluty of Cybernetics, Kiev, Ukraine

Future

At the time of writing there are some changes under way. Dr. Toby Walsh is moving from the University of York to the University College Cork (NMRC−UCC) which requires an amendment to the contract.

The Executive Council will meet again on 14th October 2002 in Madrid to discuss the networks until then realised achievements and to review procedures, etc.

European Summer School on Logic, Language, and Information (ESSLLI−2002)

Claire Gardent, chair of the Programme Committee LORIA, Nancy, claire@coli.uni−sb.de

The European Summer School in Logic, Language and Information (ESSLLI) is this year in its 14 edition and will take place in Trento from the 4th to the 17th of August 2002, co−organized by the Istituto Trentino di Cultura and the University of Trento, under the auspices of the European Association for Logic, Language and Information (FoLLI).

Initiated by a small group of researchers, the first ESSLLI was held in Groningen (The Netherlands) in 1989. Successfully fighting off the many financial, organisational and scientific difficulties inherent in making such an event come true, ESSLLI has now become a significant event in the logic, language and computation community.

A mark of its significance is the large number of applications to hold courses and workshop that were received last year : in total, 97 such applications were received from which the scientific committee had the difficult task of selecting 42 courses and 6 workshops. A new feature this year is that all courses and workshops are interdisciplinary bearing on logic & language, logic & computation or language & computation. As usual, courses are classified as foundational (requiring no knowledge of the field), introductory or advanced while the workshops present a range of selected papers centered around a specific topic.

Other features of the summer school include the evening lectures (five this year), a satellite workshop on "Learning algorithms for lexicalised grammars", a colocated event "The 7th conference on Formal Grammar" and a student session which this year boasts 17 oral presentations and 12 posters (The full program, with the detailed description of the courses and workshops, is available on the web site www.esslli2002.it).

All in all, it seems that ESSLLI has become what it was meant to be: "an important meeting place and forum for discussion for students and researchers interested in the interdisciplinary study of Logic, Language and Information".

European Summer School on Logic, Language, and Information (ESSLLI−2001)

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The ESSLLI Summer Schools are annually organized under the auspices of FoLLI the `European Association for Logic, Language and Information'.

The main focus of ESSLLI is on the interface between linguistics, logic and computation. The school has developed into an important meeting place and forum for discussion for students, researchers and IT professionals interested in the interdisciplinary study of Logic, Language and Information.

This year ESSLLI is organized by ITC irst and University of Trento, ittakes place in Trento, Italy, August 5 16. The programme is available at: http://www.esslli2002.it/. Vienna (Austria) will host ESSLLI in the year 2003.

Previous ESSLLI summer schools have been highly successful, attracting around 500 participants from Europe and elsewhere. They were held in Groningen (The Netherlands, 1989), Leuven (Belgium, 1990), Saarbrucken (Germany, 1991), Colchester (UK, 1992), Lisbon, (Portugal, 1993), Copenhagen (Denmark, 1994), Barcelona (Spain, 1995), Prague (Czech Republic, 1996), Aix en Provence (France, 1997), Saarbrucken (Germany, 1998), Utrecht (The Netherlands, 1999), Birmingham (UK, 2000), Helsinki (Finland, 2001).

In previous editions of ESSLLI the courses covered a wide variety of topics within six areas of interest: Logic, Computation, Language, Logic and Computation, Computation and Language, Language and Logic. The novelty of this year edition is the special emphasis on the interface between the basic areas (Logic, language, and Computation). So, this edition offers about 50 courses, organized into three interdisciplinary areas (Language & Computation, Language & Logic, and Logic & Computation), at a variety of levels (foundational, introductory, advanced), as well as a number of workshops.

The courses and workshops. There are three di erent types of courses: Foundational, Introductory and Advanced. Foundational Courses aim to provide truly introductory courses into a eld. The courses presuppose absolutely no background knowledge, and should be accessible to people from other disciplines. The Introductory Courses aim to give students the chance to familiarize themselves with subjects and problem areas which does not fall within the eld of expertise of sta at their home institutions. Advanced Courses, instead, are aimed at the acquisition of more specialized knowledge about already familiar topics. They also provide the opportunity for researchers to give intensive courses at high levels.

The Workshops are intended to encourage collaboration and the crossfertilization of ideas by stimulating in−depth discussion of issues which are at the forefront of current research in the field.

Student Session, Evening lectures, and Satellite Events. In addition to courses and workshops there are a student session, evening lectures, and a number of satellite events, such as `Formal Grammar.

During ESSLLI'96 in Prague, by way of experiment, the rst ESSLLI Student Session was organized. Since then its aim is to provide Masters and PhD students with an opportunity to present their own work to a professional audience, thereby getting informed feedback on their own results. Unlike workshops, the student session is not tied to any speci c theme. And each year, the Best Paper Prize is awarded, after evaluating the quality of the submission and presentation. In addition, those students involved each year in the organization of the student session, obtain a valuable experience on running such scienti c event, having to deal by

themselves with reviews, editing of the proceedings, etc. Even though the session is completely on the hands of the students, they continuously receive support, guidance and feedback from experts in the field.

All in all, the student session is proving itself as a very valuable addition to ESSLLI _ The ever increasing number of submissions, coming from all over the world, definitely shows that there is an interest in a forum like this.

Evening lectures are given by distinguished scholars, and address the general ESSLLI public. More and more satellite events are being organized during and around ESSLLI summer schools. Since ESSLLI'95 in Barcelona, a Formal Grammar conference is organized the weekend preceding the summer school. It provides a forum for the presentation of new and original research on formal grammar, especially with regard to the application of formal methods to natural language analysis.

This year's conference will have a modular architecture. It will feature a special session on nite−state methods as they pertain to formal grammar, and a panel on "Formal Grammar and the Curriculum". The panel should create the basis for the development of an archive of educational material related to formal grammar such as course notes, assignments, software and demos. It will also host a Symposium Session, co−sponsored by CologNet and ESLNET, on "Combining logical and data−oriented approaches in NLP".

The Summer School is increasingly being used as a stepping stone for publications: several special JoLLI issues based on workshops held during previous summer schools have appeared, or are about to, and a number of titles in the SiLLI book series are based on workshops and courses held during previous Summer schools. Summer School lecturers and workshop organizers are encouraged to contact members of the editorial boards of JoLLI and SiLLI to discuss publication plans.

Applications to host the summer school must be sent to FoLLI's Standing Committee for the Summer School that decides on locations, appoints the program committees and organizing committees, and discusses matters of policy regarding the summer schools.

Unexpected High Student Boom in the "International Masters Programme in Computational Logic" at the Technische Universität Dresden.

Bertram Fronhoefer, Bertram.Fronhoefer@inf.tu−dresden.de

The ``International Masters Programme in Computational Logic'' at the Department of Computer Science at the Technische Universität Dresden, established in 1997, is booming. Every year 50 students with Bachelor degree can be accepted for the two years programme. Now, short time before the application deadline for the next academical year, there are already more then 500 applications. In the past years the majority of students came from Eastern Europe and Southeast Asia. This year the number of interested students coming from India is about 70%. Furthermore, students from Pakistan, Bangladesh and China form another large part of the applicants.

- There seem to be several reasons for this increase in interest:
- The course is well−known and well established after 5 years.
- A lot of advertising has been made by the German Academic Exchange Service, who provided the initial funding for this Masters Programme, for such international study programmes in Germany.
- Finally, the best advertising are the alumni. Most of them are now pursuing a PhD at renowned universities or found interesting jobs in companies. These examples exert a wide influence on other students.

The shadowy side of this high wave of interest is much overwork for our administrative staff as well as for the evaluation committee in processing the applications. Another difficult issue is the wide qualitative bandwidth in the worldwide university landscape. This bandwidth is so serious that the level of knowledge and the scores of the applicants are difficult to compare to each other. Therefore, it is very complicated to make an optimal selection of the best. In the long run there seems to be no way around entrance examinations which should not be inappropriate for an elite study programme.

In order to get all students on the same starting level, so−called bridging−courses are already under development, where the students get a chance to refresh the knowledge indispensable for starting to study in the Masters Programme.

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1 Logic for Component−based Software Development

Software Engineering is entering a new era: the component era. Component−based Software Development (CBD) has been hailed as the Industrial Revolution for IT. Industry is taking CBD very seriously and investing in it. CBD represents a paradigm shift in software development: from building monolithic, single−platform, purpose−built−from−scratch systems to constructing assemblies of ready−made components that are platform−independent and supplied by third−parties.

This paradigm shift can only be achieved if there is a corresponding paradigm shift in the underlying method of reasoning. The traditional posit−and−prove style of software development uses a posteriori reasoning. By contrast, CBD requires a priori reasoning, since components' properties must be known prior to deployment (otherwise, it would be impossible to know if and/or which components are deployable).

The ultimate goal of CBD is third−party assembly, i.e. third−party deployment of independently produced components. For this, it is necessary to have predictable assembly and component certi cation, i.e. trustworthiness or reliability. Whereas in traditional software engineering, reliability is only an option, and can be `switched on or o ' as desired (by deciding whether to employ design by contract or not), for CBD, reliability is essential since without reliable components it would be futile to attempt to construct any complex systems at all. Thus reliability is part and parcel of CBD: this is another key aspect of the paradigm shift to CBD.

Current CBD approaches, mostly old OO versions rehashed, have no means of achieving third−party assembly because they cannot guarantee predictable assembly or reliability, which is in turn due to the fact that they do not use a priori reasoning.

This workpackage is motivated by our belief that CL can provide a basis for a priori reasoning, and can therefore play a crucial part in CBD.

2 Aim and Objectives

The aim of this workpackage is to encourage the takeup of CL in CBD research in both academia and industry. The objectives are: (i) to provide a CBD knowledge base of research, technology and trends; and (ii) to organise joint research activities, workshops and meetings, for the two communities.

To this end, we are preparing Expressions of Interest for Framework 6, and organising a COLOGNET workshop on CBD.

3 Framework 6 Expressions of Interest

Two Expressions of Interest will be submitted to Framework 6, one for an Integrated Project on CBD in CL, with COLOGNET members and some SMEs, and one for a Network of Excellence in CBD, consisting of COLOGNET, FME, Formal Methods Europe (http://www.fmeurope.org) and CoFI, Common Framework

Initiative for algebraic speci cation and development
(http://www.lsv.ens−cachan.fr/~bidoit/CoFI/index.html).

4 CBD Workshop

A COLOGNET Joint Workshop on Component−based Software Development and Implementation Technology for Computational Logic Programming has been planned for 18−20 September 2002, Madrid, Spain, co−located with SAS/LOPSTR/AGP 2002. This is organised by the two COLOGNET workpackages concerned.

LOGIC AND AGENTS

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This article provides a brief overview of a new activity, funded jointly by AgentLink and CoLogNET, and aiming to enhance interactions between the Agent and Computational Logic communities.

We begin by providing an overview of the two networks involved (although readers should refer to the network WWW sites for full information).

AgentLink

AgentLink is the EU's Network of Excellence for agent−based computing. AgentLink coordinates research and development activities in agent−based systems and supports a range of activities aimed at raising the profile, quality, and industrial relevance of agent systems research and development in Europe.

The view of agents from AgentLink is that "an agent is an autonomous software system: a system that can decide for itself what it needs to do." In addition, agents are deemed important for several reasons:

- they are seen as a natural metaphor for conceptualising and building a wide range of complex computer systems;
- they cut across a wide range of different technology and application areas, including telecoms, human−computer interfaces, and distributed systems;
- they are seen as a natural development in the search for ever−more powerful abstractions with which to build systems.

AgentLink divides its activities into five main areas:

1. Industrial action ("facilitating technology transfer through a program of industrial meetings, workshops, standardisation updates, and working groups");
2. Research coordination ("promoting excellence in European agent research through support for workshops, special interest groups, and dissemination of research results");
3. Teaching and training ("establishing agent related skills throughout Europe

The LACL conference series

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There is a lasting interest in the use of formal methods and logic in natural language modeling and processing, both for syntactical and semantical models, and, in particular, for the interplay between syntax and semantics. Typical topics which have shown their relevance and are still under development include : Categorial grammars, Categorial type logics, Compositionality, Discourse representation theory, Dynamics, Feature Logics, Formal language theory, Game−theoretical semantics, Grammatical inference, Learning theory, Linear logical frameworks, Minimalism, Modal logics, Montague semantics, Parsing as deduction, Prooftheoretic approaches, Situation semantics and situation theory, Type−theoretic approaches.

The LACL series of conferences aims at providing a forum for the presentation and discussion of current research in all the formal and logical aspects of computational linguistics, which are listed above. It started as a workshop held in Nancy (France), in 1995, whose selected papers appears as the issue 7(4) of the Journal of Logic, language and Information. Due to its success, it was turned, the next year, into an international conference. The proceedings of the LACL conferences (96, 97, 98, 01) are published by Springer Verlag as volumes 1328, 1582, 2014 and 2099 of the lecture notes in A.I. An idea of the topics covered by the LACL conference series can be given by naming some of renowned speakers: Denis Bouchard, Jean−Yves Girard, Aravind Joshi, Makoto Kanazawa, Marcus Kracht, Seth Kulick, Yves Lafont, Joachim Lambek, Dale Miller, Michael Moortgat, Fernando Pereira, Geoffrey K. Pullum, Maarten de Rijke, Barbara C. Scholz, Edward Stabler, and Mark Steedman.

The LACL conference series enriches the spectrum of conferences in computational linguistics, firstly by the emphasis on methods issued form mathematical logic, and also by the threefold nature of the objectives :

- the design of logical tools for natural language processing,
- but also the understanding of human processing of natural language,
- as well as the mathematical and computational study of the underlying formal systems, in particular the logical ones.

[*] Co−chair of the 1st LACL workshop; chair of the program and organizing committees of the first LACL (96); member of the program committte of LACL‘98; chair of the organizing committee of LACL‘01.

The Amsterdam Colloquium

Paul Dekker, ILLC, University of Amsterdam

The Amsterdam Colloquium, held from Monday 17 to Wednesday 19 December in Amsterdam 2001, was the thirteenth in a series which started in January 1976. The Amsterdam Colloquium is a congress in the area of semantics, broadly conceived, and it is utterly interdisciplinary. It offers a platform for logicians, linguists, computer scientists and philosophers with an interest in the vast area of the semantics of natural and formal languages.

The subject matter is both the linguistic approach to semantics, aimed at the description of and theorizing about meaning in natural language, as well as the logical, mathematical and computational approaches to formal languages. It is especially this trade−off between the various disciplines which makes the colloquia into such an inspiring and successful enterprise.

Initially started on a modest base in 1976, with about 30 researchers from the Netherlands, Germany and the United Kingdom, the Amsterdam Colloquium has grown out to be the largest regular scientific meeting in this area, with participants from almost all European countries, and many more outside of Europe. (Only Antarctica has not yet been represented.)

Over the years, the Amsterdam Colloquia have witnessed, enhanced, and critically discussed many developments, such as the raise of Montague grammar, the theory of questions and answers, generalized quantifiers, discourse representation theory, categorial grammar, dynamic semantics etc. Also less linguistically oriented work found its way to the colloquia, like work on the semantic and computational properties of programming languages, information representation, modal, dynamic, and non−monotonic logics, computational semantics, game theory, etc.

Many quite renowned speakers have delivered a contribution to the colloquia in the past years, either as an invited speaker, or as an individual researcher who submitted a paper. Among the most renowned ones we mention a selection: Nicholas Asher, Emmon Bach, Jon Barwise, Gennaro Chierchia, Elisabet Engdahl, Dov Gabbay, Peter G\aa rdenfors, Joe Halpern, Irene Heim, Hans Kamp, Lauri Karttunen, Ed Keenan, Angelika Kratzer, David Lewis, Barbara Partee, John Perry, Mats Rooth, Robert Stalnaker, Anna Szabolcsi, Ray Turner, and Ede Zimmermann.

Apart from being a meeting place for the established community, the Amsterdam Colloquium is also the ultimate place where young and coming researchers can update their knowledge, and raise and exchange their findings in their and in related areas of expertise. Communication, and establishing contacts, has not only been the subject matter of the Amsterdam Colloquia, but it has always been one of its main purposes.

The next meeting will be held in December 2003, of course, in Amsterdam.

Tool Support for Formal Methods

Subtitle: VSE−II as a model for a mathematically founded technique in Software Engineering

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Today, safety and security issues play a more and more essential role in Software Engineering. In traffic, medicine, telecommunication, in fact in any safety critical area, risks are just not affordable.

Yet, traditional software engineering approaches are not perfectly suited for the new challenges. Consider the commonly used artefacts in standard software engineering. It all starts with a coarse and usually rather short informal specification of requirements. In a next step, the requirements engineering phase, some of the most basic notions, concepts, and abstract requirements are specified. At this stage already, one distinguishes between abstract system descriptions and postulated properties that conceptually fit these descriptions. From the abstract system specification a high level design is generated which serves as a starting point for more and more concrete realisations, finally leading to a runnable program written in some target programming language. With today's commonly used means only the final implementation is mathematically clear und thus can be subject of validation. From this follows, however, that particularly in case of safety critical applications an enormous effort has to be spent for testing.

It thus turned out that software engineering approaches need to be enhanced by new methods that guarantee (with mathematical precision) the correctness and the trustworthiness of software components, and that in all phases of the software development process. This means that also the rather abstract intermediate steps are to be described in a precise mathematical manner in order to prove properties already in early stages of the software development.

This leads to three equally important requirements: an adequate method for programming in the large, a powerful deductive support for all formal concepts, and the integration into an administration and visualization system.

VSE−II is a tool that serves these requirements. It was developed on behalf of the German Federal Office for Information Technology (Bundesamt für Sicherheit in der Informationstechnik, BSI) and was formally approved by the BSI who officially recommends it for software developments of information systems with the highest quality levels according to ITSEC and CC.

Its methodology allows for a modular development and to refine (i.e. to implement) abstract specifications. In general, VSE−II aims at the development process of software and distinguishes on a substantial support for all phases of the development process.

Refinement steps are specified by means of abstract programs that use concepts from the lower (import) level in order to implement the more abstract ones on the higher (export) level. The bottom layer is given by a collection of predefined concepts that can directly be realised in a target programming language. In this context modularity is a key concept that allows sub−specifications to be implemented separately. At each level, safety and/or security requirements can be formulated in addition to the system specification.

From this all we conclude that complex software solutionsdemand for an extension of ealier software engineering techniques by mathematically founded methods.
And in fact, this just reflects what is common in other engineering disciplines for a fairly long time.
Practically this is made possible by the use of tools
like VSE−II.

Workshop at CADE−19

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The Automated Reasoning (AR) area of CologNet is proposing a workshop at CADE−19, to be held on 28th or 29th July 2003 in Miami.

The aim of this workshop will be to identify some grand challenges that will fire the imaginations of both new researchers arriving into AR as well those already long established in the field. The tradition of grand challenges is common in many branches of science. Some examples of grand challenges within computer science include: to prove whether P = NP (open), to develop a world class chess program (completed, 1990s), or to automatically translate Russian into English (failed, 1960s). Such challenges help determine the fundamental limits of computation, as well as often capturing the imagination of scientists and the public alike. The UK Computing Research Committee has proposed a set of criteria for assessing grand challenges in computing which can be applied to grand challenges in automated reasoning. There is no expectation that grand challenges will meet all of these criteria, but they is an expectation that they will meet some of them:

- It arises from scientific curiosity about the foundation, the nature or the limits of the discipline.
- It gives scope for engineering ambition to build something that has never been seen before.
- It will be obvious how far and when the challenge has been met (or not).
- It has enthusiastic support from (almost) the entire research community, even those who do not participate and do not benefit from it.
- It has international scope: participation would increase the research profile of a nation.
- It is generally comprehensible, and captures the imagination of the general public, as well as the esteem of scientists in other disciplines.
- It was formulated long ago, and still stands.
- It promises to go beyond what is initially possible, and requires development of understanding, techniques and tools unknown at the start of the project.
- It calls for planned co−operation among identified research teams and communities.
- It encourages and benefits from competition among individuals and teams, with clear criteria on who is winning, or who has won.
- It decomposes into identified intermediate research goals, whose achievement brings scientific or economic benefit, even if the project as a whole fails.
- It will lead to radical paradigm shift, breaking free from the dead hand of legacy.
- It is not likely to be met simply from commercially motivated evolutionary advance.

To participate in the workshop please send a one page statement of interest to Toby Walsh (preferably by email to tw@4c.ucc.ie) on or before May 1st 2003. If you wish to have a position paper in the proceedings, please send a postscript file of between 2 and 10 pages long in LLNC format, again to Toby Walsh on or before 1st May 2003. The workshop is expected to be 1/2 day long, and to consist of a mixture of invited talks, panels, brainstorming and discussion sessions. The Automated Reasoning area of CologNet will be sponsoring this workshop. Travel grants will be available to support participation, with preference to students and others without other sources of funds to attend CADE−19.

Second Workshop on the Role of Automated Deduction in Mathematics

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The Automated Reasoning area of CologNet was a sponsor of a joint panel at the Second Workshop on the Role of Automated Deduction in Mathematics (see http://www.dai.ed.ac.uk/homes/simonco/conferences/CADE02/)and the CADE−18 Workshop on Problems and Problem Sets(see http://floc02.diku.dk/PaPS/). This was held alongside FLOC−02(see http://floc02.diku.dk/)in Copenhagen on July 31st 2002. The panelis on "Challenge Problems for Automated Deduction". Simon Colton kindlywrote the following summary of the discussion.

Panel Members: Alan Bundy, Bill McCune, Peter Andrews, John Harrison Chair: Simon Colton.

Format: 10 minute opening remarks for each panel member, followed by an hour of general discussion, open to the floor.

Initial Statements

Simon Colton opened the panel session by stating that − in his view − there are two problems halting the uptake of automated reasoning systems in mathematics: (i) the "low−hanging fruit problem", whereby ATP research has found profitable areas in verification, and, even though many people are interested in proving theorems from mainstream maths, they are paid to produce verification proofs, and (ii) the "you call that a theorem" problem, whereby many things that are counted as theorems in automated reasoning (e.g., the associativity of plus) are so trivially true to mathematicians, that the automated proof of these theorems seems very unimpressive.

Peter Andrews laid down the challenge to develop a formal mathematics library on a large scale. He suggested the six books of Bourbaki's "Elements of Mathematics" as a suitable work to formalise. He hoped that the input of the material would start off in an interactive fashion, but then it would become increasingly automatic, as it learned to prove things using the material already input.

Bill McCune followed with a discussion of the usage of theorem provers as deductive support to creativity. He talked about his collaboration with the mathematician Padmanabhan, in particular an example with cancellative subgroups. Padmanabhan was turning to Otter to prove theorems as part of the discovery process. However, it was noted that, while Padmanabhan supplied the theorems, McCune employed the prover, and Bill laid down the challenge of making powerful provers such as Otter more interactive and easier to use.

Alan Bundy argued that proving ever more difficult theorems might not be the best approach to an increased involvement of ATPs in mathematics. He suggested that it would be better to find a place in the work strategy of mathematicians, and his challenge was to increase the uptake of theorem provers by mathematicians. Two possibilities for this are to smuggle in provers via computer algebra systems and in mathematics education. Bundy suggested that a good testbed is
Non−standard analysis, which members of his research team are working on. The advantage to this is that it could help teach students the notion of proof, perhaps without even knowing it.

John Harrison ended the opening remarks by talking about the challenge of machine checking mathematics. He discussed the Mizar system developed in Poland, noting that the declarative style it employs is very easy to use. Mizar will tell you that the structure of a proof is valid, even if it cannot justify single steps in it, and

Mizar relies on its existing library. He contrasted this with ATPs, which are very weak by design, because they rarely re−use previously proved assumptions.

Some Discussion Tracks Which Followed

Colton to McCune: How did Padmanabhan come on board?

McCune: He just contacted me. The problem was never with the power of Otter, but with getting Padmanabhan to use it.

Andrews: Do you want to change his apathy towards using Otter?

Andrei Voronkov: Can you supply software for more general mathematics?

Bundy to Voronkov: We should apply systems to what we are already good at. Do you ever use Vampire to prove any of your research results?

Voronkov: But Vampire is not for mathematics, it is for combinatoric problems only.

Bundy: Is there any hope for Vampire in maths?

Voronkov: Possibly....

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Colton: What about Zeilberger's claim that the only interesting maths cannot be proved?

Everyone: general apathy towards that question: surely we shouldn't take that seriously!

Colton: OK then.

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Audience member: If you're talking about mathematicians writing their own provers, then this is very costly − they could just go out and prove theorems.

Andrews: But science can't predict when particular work is going to find an application. We should pursue advances wherever possible.

Bundy: But doesn't most of the work go into the application? There is a huge amount of work on verification.

Harrison: And verification really does rely on mathematics − it is very useful to have maths libraries available.

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John Slaney: We shouldn't be too defensive about our achievements, there's nothing wrong with low−hanging fruit.

Bundy: Automated verification of proofs is a worthy overall goal, put a very long term goal, and we don't want to go into that prematurely.

Slaney: Well, I've verified some papers for publication.

Bundy: Then can we offer a service for a particular journal?

Harrison: Or maybe it would be better to trawl some maths databases looking for large numbers of theorems which are easy enough to verify.

Chris Benzmuller: If we are checking proofs, then shouldn't we be discussing HCI issues, and looking at data on the design of maths GUIs.

Bundy to Jeremy Gow: Isn't it a question of getting the question right: have you thought about a big empirical study?

Gow: No, for the current project, we're not planning a large empirical study, but we would hopefully perform one in future.

Voronkov: We should be thinking about ways to enforce software on people. The microsoft way has been tried, and the Latex model (Knuth/Lamport) is another model.

Harrison: Well, I was advocating the ideas behind Mizar, not necessarily that we all go out and become big users.

Bundy: If I may repeat what I said earlier about education: this could be a good way to enforce the use of ATPs.

Volker Sorge to Panel: In your view, what is wrong with ATP, or, better, what is a good ATP system?

Andrews: Use heuristics whenever possible.

Bundy: A big knowledge base will be important, and the ability to transfer and adapt theorems.

Voronkov: The explanation of proofs is important. Can we understand the output from Mizar? There are sometimes inconsistencies.

Colton: I use Otter because it's got a stable distribution, it's easily available for Windows, has a manual and a great track record. These are very important things.

Report on the ECAI 2002 panel on the relation beetween Constraint Logic Programming and industry

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ECAI 2002 (http://ecai2002.univ−lyon1.fr/show_en.pl) has been held in Lyon on July 21−26, 2002. As part of the program of the ECAI 2002 workshop on
"Modelling and Solving Problems with Constraints" (http://www−users.cs.york.ac.uk/~tw/ecai02/), a panel was focussed on the issue of the relation between
CLP and industry. The invited panelists were Helmut Simonis (Parc Technologies, UK), Wim Nuijten (ILOG, France), and Laurent Zimmer (Dassault Aviation, France) and the title of the panel was "What the user really, really wants". The meaning of the title, apart from its similarity with the title of a famous song, was to concentrate on the issues that users find necessary in contraint−based tools. In particular, the aim was to point out the main features that are crucial when using such tools in real life.

Toby Walsh, the workshop organizer, was the moderator of the panel, and started it by laying a number of issues to discuss, like the debate between libraries and toolkits, the modelling and solving lyfe−cycle, the possibility of modelling uncertainty, the choice between optimization and soft constraints, explanations,CP inside (as in Intel inside), ...

Wim Nuijten started the discussion by stressing that usually the user does not care what technology is used to solve a problem, so constraints are in fact hidden from the user, who just desires to press a button and have a reasonable solution. He also said that the main features of a successful tool are: ease of use, reliability, and robustness. This is way CPLEX is so successful: because it has all these features. Explanations are useful, in his view, when there is no solution. Otherwise, it is more important that the user has confidence in the product. He also enphasized the need to teach constraint programming in schools, to create a generation of people knoledgeable in CP.

Laurent Zimmer pointed out that explanations are instead useful in some domains, for example in design. Moreover, he also mentioned that sometimes it is too expensive to use constraint technology, so industries move to other technologies.

Helmut Simonis said instead that a solving button is not enough, one needs also explanations and justifications in many planning and scheduling scenarios. This opinion, so different from Nuijten's, depends perhaps from the class of users that ILOG and Parc Technologies have. Since ILOG sells mainly tools while Parc Technologies sell solutions, it is possible that tool users are less computer science literate, so they don't desire many added features but just a reliable tool. He also mentioned that customization is often bad for scheduling packages, since it yields many different variants that have to be maintained. At Parc Technologies, they
develop hybrid solutions, which use both linear and constraint programming.

Some of the partecipants mentioned that constraint programming should be more widely available, and less costly. They has expressed the hope that the European Community could help in this respect, by funding projects which could develop free constraint−based sofware. Others wondered if there will ever be a constraint programming tool with a vast horizontal market, like Excel.

One precise question was then asked the panelists: how can we get interest from industry into constraint programming? Simonis proposed to consider one problem and to use it for confidence building. He also recommended not to talk about the technology itself. Nuijten enphasized reliability, in the sense of assuring

that in a certain number of seconds one can get optimality within a certain tolerance.

Another question was about the main obstacle for the customers to adopt constraint−based technology. Nuijten stressed that education would be very important,
and mentioned the ILOG academic licence program, which allows universities to use and teach constraint programming via ILOG tools. Simonis mentioned the ECLIPSE summer school, and also suggested to consider the productivity of the people using the tools.

This panel has been a first attempt to listen to constraint−knowledgeable industry people and to discuss the relation between CLP and industry. In particular,
it has been interesting to see that many of the features that researchers are working on at the theoretical or prototype level are not yet considered as crucial in real life. This means that either we have to push them more and make the CP producers know about these features, or that we should realize that our idea of what is important is not really a realistic one.

Many thanks to CologNet for the support given to the panelists.

Calendar of Events

This calendar contains announcements of events in the area of Computational Logic and related areas. The calendar is maintained by CoLogNET and has been created on the basis of messages sent to CoLogNET−event−list. If you wish to have your event listed here, please send a message to CoLogNET−event−list.

Event types

Conf	Conference
WS	Workshop
SSchool	Summer School
Col	Colloquium
Symp	Symposium

September 2002

Start date	End date	Category	Subject	Place
16 Sept 2002	18 Sept 2002	Symp	APPIA−GULP−PRODE 2002	Madrid, Spain
17 Sept 2002	20 Sept 2002	Symp	The 9th International Static Analysis Symposium SAS '02 17 − 20 September 2002	Madrid, Spain
18 Sept 2002	20 Sept 2002	WS	LOPSTR´02 − International Workshop on Logic Based Program Development and Transformation	Madrid, Spain
18 Sept 2002	20 Sept 2002	WS	CIA 2002 − Sixth International Workshop on Cooperative Information Agents	Madrid, Spain
19 Sept 2002	20 Sept 2002	WS	CoLogNET Work Package 12 "Education and Training" **Note that DATE and LOCATION are not yet definitely fixed!** Please consult the web page mentioned above for the final announcement.	Madrid, Spain
19 Sept 2002	20 Sept 2002	WS	Joint CoLogNet Workshop − Component−based Software Development and Implementation Technology for Computational Logic Systems	Madrid, Spain
23 Sept 2002	26 Sept 2002	Conf	JELIA´ 02 − 8th European Conference on Logics in Artificial Intelligence	Cosenza, Italy

August 2002

Start date	End date	Category	Subject	Place
03 Aug 2002	04 Aug 2002	Symp	First COLOGNET−ELSNET Symposium	Trento, Italy
25 Aug 2002	30 August 2002	SS	ISCL 2002 − Second International Summer School in Computational Logic	Acquafredda di Maratea, Italy

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