

Nordic Graduate School of Language Technology

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A proposal to NorFA

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1 Description of the planned Nordic Graduate School of Language Technology

1.1 The proposed school's scientific area

We are at the beginning of a revolution in the way we interact with computers. The traditional human-computer interface involving a screen and a keyboard will increasingly be replaced by more natural ways of interacting. Over the last five years we have become increasingly used to the idea that vast amounts of information are available in the form of natural languages, over computer networks which are universally accessible. For many *IT* has become synonymous with the world-wide web. At the same time mobility is increasing and there is a huge demand for access to information by people on the move as is shown by the success of mobile telephones. Our homes are increasingly populated by complex machines which contain more and more computational elements such as video machines and microwave ovens. Our machines are becoming more and more capable of carrying out complex tasks but at the same time the interfaces tend to be more and more frustrating and less and less user friendly. We need to be able to interact with our machines in a more human way and the key to this is human language. An increase in the linguistic capability of our machines could improve the quality of life in the information society in almost any area you care to look. Here are some examples:

mobility People on the move cannot be looking at a screen and typing on a keyboard. They may, however, need to interact with a machine that can tell them where to go or be able to process email or other messages or look up information on the web.

appliances in the home Leisure has become more complicated. Digital TV provides us with hundreds of channels and we want to make an informed choice. Video machines are notoriously difficult to program. Currently there is a great deal of interest in smart houses which will enable us to interact with devices in the home in a number of different ways including via internet and phone. Devices that can engage you in simple conversations and have even a limited understanding of what you say to them could bring immense improvement to people's lives.

services Increasingly banking, travel, cinema and theatre booking as well as information services in general are becoming automated. We can, for example, communicate with our banks by phone or by computer interface. Current phone interfaces are normally menu driven and tedious, and if things go wrong it is probably best to hang up and start again. A telephone interface with simple dialogue capabilities could greatly improve this situation.

multilinguality The need for communication between people who have different native languages has increased dramatically in the information society. At the same time there is a desire to preserve linguistic diversity. An international information society with English or Chinese as the dominant language is as unappealing as it is unjust. Computational systems that can communicate in different languages or that can assist with translation are now available, but they are in need of improvement, as anybody who has used translation systems available on the internet will realize. There will be an increasing need for Computer Assisted Language Learning, especially in Europe where more second and third language competence will be needed.

incoming information Electronic media have made possible the storage of vast quantities of information in the form of human language. Current information technology has made large amounts of this information available, although it can be a time-consuming and frustrating experience to find precisely the information you want. Language technology gives us ways of sorting this information by various techniques of document classification and information extraction. Information filtering is perhaps one of the most important tasks we need to find solutions for in the coming information society.

outgoing information The information society puts increased pressure on us to create documents and to communicate, often across linguistic barriers. We need tools that will help us to author documents and decrease the time we need to do it. Spelling, grammar and style checkers are much more widely available for majority languages like English than for minority languages like Swedish. Very few of these tools are oriented to the needs of non-native speakers.

information exchange Sometimes people need help to communicate with each other, for example if they do not have a common language. Various kinds of disabilities can also make communication more difficult. Current language technology translation and dialogue systems and aids for people with special needs will in the future be able to benefit from the development of multimodal systems (which, for example, can take account of facial expressions) and the possibilities available for communicating with the aid of virtual environments.

The two basic technologies which underlie language technology applications are speech technology and natural language processing (NLP). Speech technology is concerned with the processing and generation of speech signals. NLP, broadly speaking, has to do with the processing and generation of strings of words (e.g. written text). Speech technology and NLP developed as two separate fields. Speech technology has been for the most part engineering oriented while NLP has in large part been linguistically oriented. In recent years there has been increasing recognition that these two technologies need to be integrated in order to produce the next generation of language

technology applications such as spoken dialogue systems, spoken translation systems, and information systems with spoken language interfaces. It is a central feature of the graduate school's programme that these technologies be integrated and that young researchers be trained who are familiar with both.

It is of extreme strategic importance that the Nordic countries develop and enhance their competence in this area. There is not only a need for language technologists in industry but also a great need for teachers and researchers in the universities. It is at the moment a world-wide problem that there are not enough competent researchers to cover the basic research that needs to be done in order to enable the development of the technology involved, and it is towards such basic research that the school will be oriented.

Even though the Nordic countries represent technologically advanced societies who are already deeply involved in the information and communication age, Nordic languages, seen on a world scale, are small languages which do not attract the attention of multinational corporations in the language industry to the extent that is necessary to support technological development. It is therefore essential that the Nordic countries develop their own research and advanced training programmes to avoid the risk of up-to-date language applications only being available in English with the consequence that Nordic languages become second-class languages.

1.2 Aims of the proposed graduate school

The proposed Nordic graduate school of language technology has the following goals:

- to provide a forum for graduate students in language technology in which they can obtain advanced research training of a standard and breadth which is not available at any one of the individual participating institutions, not even in any single Nordic country alone
- to raise the general standard of language technology education in Scandinavia in order to meet the increasing need in industry and academic research of researchers and developers with competence in language technology
- to create a broad interdisciplinary platform for graduate education in language technology. This platform should provide a multidisciplinary basis on which the student can build further
- to create an international profile by inviting instructors from foreign universities and research institutes and by encouraging interaction between students from

- the Nordic countries and their peers in other countries (including non-Nordic countries)
- to exploit similarities between many of the Nordic languages by encouraging students to reuse linguistic resources and technologies designed for one Nordic language as a base for creating similar tools for the other Nordic languages

The school aims to achieve these goals by building on the structure and activities provided by the existing national graduate schools of language technology in Sweden and Finland, linking the courses and seminar activities of the two schools and including the remaining Scandinavian countries, the Baltic countries and NW Russia in the activities.

1.3 Activities

The school will seek to achieve these goals by increasing the mobility of students, teachers and supervisors and by building a critical mass of Nordic graduate students who are in contact with each other because they are attending courses, seminars and workshops together. The Nordic graduate school will provide a base with increased resources for inviting guest lecturers and visiting professors and enabling students to obtain supervision in their particular area from a Nordic pool of qualified researchers.

Mobility for students, teachers and supervisors The graduate school would provide funds for students, teachers and supervisors to take part in intensive teaching periods. In addition there should be funds for students to travel to supervisors for the purpose of individual supervision and funds for teachers and supervisors to meet to plan jointly taught courses and strategy for the school.

Guest lectures and visiting professors The intensive teaching periods would include guest lectures by scholars from outside the Nordic countries and we would also involve visiting professors in jointly taught courses.

Seminars and workshops The intensive teaching periods would include seminars, workshops and an internal conference at which both graduate students and teachers would present current work. Non-Nordic invited speakers would also take part in these events.

Initiatives for the improvement of supervision and exchange of supervisory experience

Funds would be provided for students to obtain secondary supervision from supervisors within the graduate school not at the student's home institution. In this way, a student can obtain supervision from an expert in his or her particular area which is not available at the home institution. The activities of the graduate school will also allow for supervisors to meet and consult and exchange knowledge and experience concerning the teaching of particular areas. This will be achieved both by informal meetings and the activity of team teaching courses.

Graduate courses Graduate courses would be taught on the model that has been successfully developed in the Swedish national graduate school of language technology. This involves two intensive periods of teaching (in the beginning and middle of the semester) and a final concluding seminar session. Between these meetings the courses continue by distance techniques using web technology. Most or all of the courses are taught by a collection of teachers from different institutions. There are three levels of courses. The higher levels may presuppose that students have already successfully complete courses on lower levels. Level 1 courses provide graduate introductions to the various areas of language technology, showing where the open research questions lie. Level 2 courses provide a more in depth view of a particular sub area of the field, again concentrating on research oriented teaching. Finally, level 3 courses involve working with one or more particular projects which the course teachers are involved with, i.e. teachers and students engage in research together.

1.4 Concrete plans for the first five years

The school will offer four courses and one workshop/internal conference per year. Each event will be coordinated by one of the key supervisors in a different participating country in order to achieve a spread of activity across the participating countries each year. In addition as far as possible we will seek to have the teaching of each course be a collaboration between members from different countries. Two courses will be offered each semester. The courses planned for the first year are:

Course	Coordinator	Local institution responsible
<i>Spring Term</i>		
Natural Language Processing, level 1 Speech Technology, level 1	Joakim Nivre, Växjö University, Sweden Torbjørn Svendsen, Norway	GSLT (Swedish graduate school) NTNU
<i>Autumn Term</i>		
Linguistic Resources, level 2 Soft computing and data oriented methods, level 2	Daniel Hardt, Denmark Lauri Carlson, Finland	Copenhagen Business School KIT-GS (Finnish Graduate School)

A similar pattern of course offerings will be available in the following years. The exact courses to be offered will be determined in consultation with the students and potential teachers in order to best meet the needs of the students and the development of research within the discipline during the life of the school. A selection of potential courses can, for example, be found on the course planning pages of existing organizations, e.g. <http://www.gslt.hum.gu.se/courses/> and <http://www.ling.helsinki.fi/kit/tutkijakoulu/courses/index.shtml>.

An advantage of offering courses in conjunction with the existing national graduate schools is that students attending one course at the Nordic graduate school may be able to attend other courses which are running in parallel without additional costs for travel and accommodation.

We plan an internal end of year conference and evaluation which in 2004 will be held at the University of Iceland under the organization of Eiríkur Rögnvaldsson. This conference will take the form of a research workshop at which both graduate students and established researchers will present papers and also a seminar meeting at which graduate students can present their work to the school. It will also allow for as many as possible who are involved in the school to meet and evaluate the progress of the school. This annual meeting of the school will also play an important role in identifying potential material to be developed as submissions to the planned Nordic Journal of Language Technology which the school will be responsible for.

2 Research and training in the Nordic countries

The Nordic countries are active in the field of language technology and there are a number of excellent research groups carrying out research to an international standard. However, there is no single group which has the critical mass of teachers to provide an internationally competitive training for graduate students, since the field is broad and interdisciplinary. In order to address this problem both Sweden and Finland have created national graduate schools.

The Swedish graduate school GSLT (Graduate School of Language Technology) had its first intake of 13 students in the autumn of 2001 and a second intake of 14 in 2002. Göteborg University (Faculty of Arts) is the coordinating host. Students may be registered at any of the following academic institutions in addition to Göteborg University: Höskolan i Borås, Chalmers University of Technology, KTH (Royal Institute of Technology), Linköping University, Lund University, Höskolan i Skövde, Stockholm University, Uppsala University, Växjö University. Other institutions may be added in the future. Supervision is also available from SICS (Swedish Institute of Computer Science). Professor Robin Cooper, Department of Linguistics, Göteborg University is director of the school.

The name of the Finnish graduate school is "Graduate School of Language Technology in Finland" (in short: KIT-GS), in Swedish "Språkteknologisk forskarskola i Finland", and in Finnish "Kieliteknologian valtakunnallinen tutkijakoulu (KIT-tutkijakoulu)". The KIT-GS received funding for 5 graduate students, in addition to whom there are some 10 students with funding from other sources (some are self-supported). The responsible and coordinating university of KIT-GS is the University of Helsinki, and it operates in cooperation with Universities of Joensuu, Oulu, Tampere, Turku and Åbo Akademi, Technical universities in Helsinki and Tampere. Centres of excellence participating in the school (see <http://www.aka.fi>) are

- Multilingual Language Technology Unit at the University of Helsinki, University of Helsinki, Department of General Linguistics. (Nominated by the Academy of Finland for 1995-1999.)
- Neural Networks Research Centre at the Helsinki University of Technology. (Nominated by the Academy of Finland for 2000-2005)
- Signal Processing Algorithm Group, SPAG, at the Tampere University of Technology. (Nominated by the Academy of Finland for 2000-2005)
- From Data to Knowledge group at the University of Helsinki. (Nominated by the Academy of Finland for 2002-2007.)

The director of the school is Professor Kimmo Koskenniemi of the Department of General Linguistics at the University of Helsinki.

While the other Nordic countries do not as yet have national graduate schools in language technology there are a number of research centres of international standard which could contribute to the teaching and supervision of a Nordic graduate school. Centres in Norway include Bergen, Oslo and Trondheim Universities. The Norwegian Research Council (NFR) has financed research seminars for doctoral students in linguistics and computational linguistics regularly for the last 10 years, based on applications from the National Board of Linguistics ("Nasjonalt fagråd for lingvistiske fag"). In addition there have been occasional research courses with local and international financing. The courses have been successful, but topic selection has been somewhat driven by coincidental offer than by actual demand from graduate students in computational linguistics. The Nordic Graduate School will be an important factor in enabling more regular and demand-driven course planning due to pooling a larger student audience. In Denmark there are regional graduate schools in linguistics one of which, GradEast, has language technology as one of its focus areas. Important research centres in Denmark are the Center for Sprogteknologi in Copenhagen as well as Copenhagen University and Copenhagen Business School and the University of Southern Denmark. The University of Iceland is also rapidly developing significant research competence in the field.

Some of the areas of the field covered at the various centres include:

aids for people with special needs Göteborg, KTH, NTNU Trondheim, Uppsala

authoring tools Bergen, CST, Göteborg, Helsinki, KTH, Uppsala

dialogue systems CST, Helsinki, Göteborg, KTH, Linköping, Trondheim

grammar development Bergen, Chalmers, Copenhagen Business School, CST, Göteborg, Helsinki, Linköping, Oslo, Southern Denmark, Trondheim, Växjö

language statistics Bergen, Oslo, Växjö

language teaching aids Göteborg, Jyväskylä, Skövde, Uppsala

language technology in multimedia CST, Göteborg, KTH, Linköping

lexicon development Bergen, CBS, CST, Göteborg, Helsinki, Oslo, Skövde, Trondheim

morphological analysis Chalmers, CST, Göteborg, Helsinki, Iceland, Oslo, Stockholm, Växjö

prediction KTH, Uppsala

semantics Bergen, Chalmers, CBS, CST, Göteborg, Oslo, Skövde, Southern Denmark, Stockholm, Trondheim

speech technology CBS, Helsinki, Helsinki Univ. of Technology, KTH, Lund, NTNU Trondheim, Skövde, Southern Denmark, Tampere Univ. of Technology

text collection and processing Bergen, Copenhagen, CBS, CST, Göteborg, Helsinki, NTNU Trondheim, Oslo, Skövde, Stockholm, Uppsala, Växjö

translation Bergen, Chalmers, Copenhagen Business School, CST, Helsinki, Linköping, Lund, Skövde, Southern Denmark, Tampere, Uppsala

At the Nordic level there is a network (funded by NorFA) called GENST-NET which supplies some funds for graduate student mobility. This has so far been used to large extent in connection with providing funding for graduate students from Nordic countries to attend courses in the Swedish and Finnish graduate schools.

While the various centres have excellent capabilities in various specializations, together they can offer a broad spectrum of what is currently of importance in the field internationally and can have an opportunity to train graduates with a broad knowledge of how the various parts of the field interact. The impact of the graduate school will thus have a considerable effect on the Nordic countries' ability to build future generation technology that will need the coupling of the various technologies that we have today and also maximize the use of pan-Nordic resources so that effort will not be wasted developing similar software separately in the different countries.

3. Organisation of the graduate school

The day to day administration of the graduate school will be a collaboration between Göteborg and Helsinki. Robin Cooper will be director and Kimmo Koskenniemi will be co-director. Each will be assisted by an administrative assistant. The total administrative effort (both directors and assistants) will be 60% of full-time. While administrative tasks will be carried out with regular consultation between Göteborg and Helsinki, the division of main responsibility between the two sites will be as follows: Göteborg – course planning, international relations, Helsinki – distribution of funds to Nordic participants, conference and workshop organisation. The sites will be jointly responsible for admissions to the school, policy development and board meetings.

There will be an Academic Board consisting of the two directors, representing Sweden and Finland, together with one representative each from the other participating count-

ries.

The Board will meet at least once every semester (i.e. twice a year). The Board's mandate will include

- making decisions concerning scientific content
- the development of a scientific profile of the school
- planning of courses, supervision and other of the school's activities such as seminars, workshops and conferences
- ensuring academic diversity and competence
- making decisions concerning the size of the school
- the administration of applications by graduate students wishing to take part in the school

Courses will normally last one semester and will have one intensive period near the beginning of the semester, one near the middle and a final seminar near the end. Intensive periods for a single course will normally last two days. Between these intensive periods teaching of the course will continue by distance methods. Each course will have a designated course leader who will be responsible for organising the course. Team teaching of courses by teachers from the different countries and by guest teachers from outside the school is encouraged. The intensive periods of a course will normally take place at the coordinator's home institution, although, if desired, other arrangements can be made (e.g. using facilities associated with the existing national graduate schools, combining several courses together to make a longer intensive period). The school's other activities (seminars, workshops, internal conferences) will normally be in conjunction with an intensive teaching period (in order to save travel).

Students who have been accepted into a graduate programme in Language Technology (or corresponding discipline such as Computational Linguistics) in their home country at a participating site will be able to take part in the school's activities. While courses will be approved by the Board and assigned ECT credits the formal responsibility for examination of students will reside with the local institution where the student is registered. This will mean that the school as such does not have to make decisions about how the school's courses are to be counted towards degrees in the participating countries. No extra fees for teaching will be charged to students or their departments for taking part in the school's activities.

Internal evaluation of the school will consist of course evaluation by the students supplemented by student evaluation of the school's activities in general. There will also

be an advisory board consisting of three distinguished members of industry from different Nordic countries who have an interest in language technology research. This board will advise the school by evaluating its progress and making suggestions for industrially relevant activities.

We expect there to be significant interest and support for the school both in language related industry and in industry which has a use for language products such as the motor industry. Already Nokia has expressed interest in and support for the school and we think that it is to be expected that there will be one or two large industries in each of the Scandinavian countries who will express similar interest in addition to smaller language related companies. In practical terms industry can play an important role in the school by presenting us with practical problems which require a research solution, providing us with data relevant to research projects, providing placements for practical work by PhD students and by giving employees release time so that they can pursue an “industrial” PhD. It is important that the school be in dialogue with industry both informally and in seminars where both industry and members of the school make presentations of relevant research and development work. Members of industry may also be interested in following some of the school’s regular courses.

4 Qualifications of the proposed director

Robin Cooper is Professor of Computational Linguistics at Göteborg University. He has an MA in Modern Languages from Cambridge, a PhD in Linguistics from the University of Massachusetts at Amherst and he has been a Fellow of the British Academy since 1993 and a Fellow of the Royal Society of Arts and Sciences in Göteborg since 1996. He has been active in graduate education since 1975 and has been first supervisor for 21 students who have completed PhDs. He has taught and supervised graduate students in the US, the UK and in Sweden. He successfully coordinated the proposal for the Swedish national Graduate School of Language Technology and has been its director since it began in 2001. He has also successfully coordinated European research projects.

5 Nordic collaboration partners and composition of the board

The board will consist of one member from each participating Scandinavian country:

Robin Cooper, Professor, Göteborg University, director
Kimmo Koskenniemi, Professor, Helsinki University, co-director
Daniel Hardt, Associate Professor, Copenhagen Business School
Eiríkur Rögnvaldsson, Professor, University of Iceland
Torbjørn Svendsen, Professor, NTNU

In addition there will be representatives from each of the Baltic countries involved and also two elected graduate students from the student body.

The school aims to allow the participation of all centres of research and advanced teaching in language technology in the Nordic countries who wish to contribute, including institutions which become involved in language technology after the school has started. As of now, the following institutions have expressed interest in joining the school:

Sweden

Swedish Graduate School of Language Technology – Höskolan i Borås, Chalmers University of Technology, Göteborg University, KTH, Linköping University, Lund University, Höskolan i Skövde, Stockholm University, Uppsala University, Växjö University. (Robin Cooper)

Finland

Graduate School of Language Technology in Finland – University of Helsinki, Universities of Joensuu, Oulu, Tampere, Turku and Åbo Akademi, Technical universities in Helsinki and Tampere. (Kimmo Koskenniemi)

Denmark

Center for Sprogteknologi (Bente Maegaard)
Copenhagen Business School (Daniel Hardt)
Copenhagen University (Nina Grønnum)
University of Southern Denmark (Per Anker Jensen)

Iceland

University of Iceland (Eiríkur Rögnvaldsson)

Norway

University of Bergen (Koenraad de Smedt)
NTNU (Torbjørn Svendsen)
University of Oslo (Jan Tore Lønning)

Estonia

University of Tartu (Prof Mare Koit)

Tallinn Technical University (Einar Meister, Laboratory of Phonetics and Speech Technology, Institute of Cybernetics)

Tallinn Pedagogical University, (Mart Rannut, Faculty of Philology)

Latvia

University of Latvia (Dr. Inguna Skadina, Institute of Mathematics and Computer Science)

Lithuania

Vytautas Magnus University (Ruta Marcinkeviciene, Centre of Computational Linguistics)

NW Russia

Saint Petersburg University (Liya V.Bondarko, Department of Phonetics)

6. Budget

Annual Budget

	Base per month	Percentage employment	Salary
Administrator (SE)	27,318	20%	65,563
Director (SE)	43,818	10%	52,582
			118,145
Holiday supplement			1,512
LOP			50,802
			170,459
Administrator (FI)	22,822	20%	54,773
Co-director (FI)	43,706	10%	52,447
			107,220
Labour costs		30.00%	32,166
			139,386
<i>Course costs</i>			
External teaching	10,000		
Travel	50,000		
System admin	10,000		
Accommodation	30,000		
	100,000		
Number of courses	4		400,000
Seminars, workshops, internal conference			150,000
Board meetings, planning meetings and supervisor mobility			120,000
			979,845
Administration costs		30.00%	293,954
			1,273,799SEK
Rate		0.8	1,019,039NOK

Attachment A. Curriculum vitae: Robin Cooper

Personal Information

Surname: Cooper
Date of birth: 23rd Dec. 1947

Given Names: Robin Hayes
Place of Birth: Shanklin, IOW

PhD degree

Year: 1975 (1st Sept)
Subject: Linguistics
Title of thesis: Montague's semantic theory and transformational syntax
Advisor: Barbara H. Partee

Postdoctoral fellowships

Year	Place
1980–1981	Mellon Fellowship in Linguistics and Philosophy, Stanford University
1981–1982	Fellowship at the Center for Advanced Study in the Behavioral Sciences, Stanford
1986–87	Guggenheim Fellowship, Stanford and Edinburgh

Current position

2001– Director, Swedish National Graduate School of Language Technology (GSLT)
1995– Professor of Computational Linguistics, Göteborg University

Previous positions

1989–1996 Principal Investigator, Human Communication Research Centre, University of Edinburgh
1989–1996 Reader, Centre for Cognitive Science, University of Edinburgh
1989–1992 Reader, Department of Artificial Intelligence, University of Edinburgh
1986–1989 Lecturer, Centre for Cognitive Science, University of Edinburgh
1986–1989 Lecturer, Department of Artificial Intelligence, University of Edinburgh
1984–1987 Docent, Department of Linguistics and Phonetics, Lund University
1981–1987 Associate Professor, Department of Linguistics, University of Wisconsin, Madison
1977–1981 Assistant Professor, Department of Linguistics, University of Wisconsin, Madison
1976–1977 Assistant Professor, Department of Linguistics, University of Massachusetts at Amherst
1975–1976 Assistant Professor, Department of Linguistics, University of Texas at Austin
1969–1971 Lektor for English language, University of Freiburg

Honours

- 1993– Fellow of the British Academy
1996– Fellow of the Royal Society of Arts and Sciences in Gothenburg

Publications 1997–2002

- Bohlin, Peter, Robin Cooper, Elisabet Engdahl and Staffan Larsson (1999) Information States and Dialogue Move Engines (9th August, 1999). In Jan Alexandersson (ed.) (1999): *IJCAI-99 Workshop on Knowledge and Reasoning in Practical Dialogue Systems*.
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- Cooper, Robin and Jonathan Ginzburg (2002) Using dependent record types in clarification ellipsis, *Proceedings of the sixth workshop on the semantics and pragmatics of dialogue*, ed. by Johan Bos, Mary Ellen Foster and Colin Matheson, Edinburgh University, pp 45–52
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- Ginzburg, Jonathan and Robin Cooper (2001) Resolving Ellipsis in Clarification, *Proceedings of the 39th Annual Meeting of the Association for Computational Linguistics, Toulouse*, pp. 236–243
- Larsson, Staffan and Robin Cooper (2000) An Information State Approach to Natural Interactive Dialogue, *Proceedings of LREC-2000 workshop on Natural Interactive Dialogue, Athens*, pp. 8–12
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- Larsson, Staffan, Robin Cooper, Peter Ljungloef, Elisabet Engdahl and Stina Ericsson (2000) GoDiS – An Accommodating Dialogue System, *Proceedings of Conversational Systems Workshop, ANLP/NAACL 2000*, Association for Computational Linguistics, pp. 7–10
- Ranta, Aarne and Robin Cooper (2001) Dialogue Systems as Proof Editors, *Proceedings of IJCAR/ICoS-3, Siena*, 16pp

Attachment B Notifications of interest with CVs for key supervisors