

# Annual Report 2008

## ILLC



UNIVERSITY OF AMSTERDAM



# Table of Contents

Chapter 1. Annual Survey.....	5
1.1 Scientific mission .....	5
1.2 Research and Funding.....	5
1.3 Teaching and PhD training.....	7
1.4 Administration.....	7
Chapter 2. Research.....	9
2.1 Language and computation .....	9
2.2 Logic and Computation.....	16
2.3 Logic and Language .....	28
Chapter 3. Graduate Programme in Logic.....	35
Chapter 4. Management.....	36
4.1 People, research input .....	36
4.2 Publications, research output.....	36
4.3 Communication .....	36
4.4 Events.....	37
4.5 Administration.....	37
Appendix 1. fte/research fte/funding.....	38
Appendix 2. List of publications.....	40
Appendix 2.1 Language and Computation .....	40
Appendix 2.2 Logic and Computation .....	47
Appendix 2.3 Logic and Language .....	57
Appendix 2.4 ILLC Prepublications.....	61
Appendix 3. Projects .....	66
Appendix 3.1 Projects awarded in 2008 .....	66
Appendix 3.2 Awards in 2008 .....	67
Appendix 4. Events .....	69
Appendix 4.1 Regular Events .....	69
Appendix 4.2 Workshops and Conferences.....	73



# Chapter 1. Annual Survey

## 1.1 Scientific mission

The Institute for Logic, Language and Computation (ILLC) of the University of Amsterdam is an interdisciplinary research institute, in which researchers from the Faculty of Science and the Faculty of Humanities co-operate. Its scientific mission is to study formal properties of information, viz., the logical structure and algorithmic properties of processes of encoding, transmitting and comprehending information. Emphasis is on natural and formal languages, but other information carriers, such as images and music, are studied as well. Research at ILLC is interdisciplinary, and aims at bringing together insights from various disciplines concerned with information and information processing, such as logic, computer science, linguistics, cognitive science, artificial intelligence and philosophy. The resulting view of information science transcends the boundaries of the university. ILLC is also committed to dissemination of its results into the broader world of general education and industrial research. Moreover, ILLC strives to build strong alliances with institutes, that share this view.

## 1.2 Research and Funding

ILLC's research is concentrated in three core programmes.

1. Logic & Computation. (Project leader: Jouko Väänänen, Deputy: Leen Torenvliet.)
2. Logic & Language. (Project leader: Jeroen Groenendijk, Deputy: Paul Dekker.)
3. Language & Computation. (Project leader: Remko Scha, Deputy: Khalil Sima'an.)

The programmes serve as the main logistic unities in the institute. For each of them, a description, a report of the developments in 2008, and a sketch of the plan for 2009 can be found in the next three chapters.

All three programmes contribute to ILLC's two research spearheads: Cognitive modelling, and Logic and Games.

### *Logic and Games*

In the past decade it has become increasingly clear that studying information, first and foremost, means studying information exchange. This acknowledgement of the inherently 'social' character of information shows up at many places in modern theory. Most strikingly, it has led to crucial contacts between logic and game theory, bringing an entirely new set of disciplines into the scope of logic: viz., economics, and the social sciences.

One particular area where interaction is crucial to intelligent behaviour is natural language. Here in the past decade, pragmatics, the study of the actual use of language between different agents, has become the primary focus of research rather than syntax or semantics. After all, it is the communicative situation that determines how syntactic and semantic conventions can arise and remain stable over time. Notions from game theory,

in particular evolutionary game theory, are being used today to chart and explain these phenomena.

### ***Cognitive Modelling***

While much of ILLC's research is abstract and normative, far removed from everyday practice, there is the reality of human performance. Nowadays disciplines such as neurophysiology and cognitive psychology are increasingly concerned with information processing and make great progress in unravelling the underlying psychophysical mechanisms. These results are of immediate relevance to logic in the broad sense it is conceived of within ILLC. Conversely, insights from logic turn out to be important for cognitive and neurosciences, providing high-level models for cognitive functions, and leading to new questions and insights that suggest new experimentation at the level of brain processes.

Also in the computational work done at ILLC there has been a cognitive turn. In the fields of computational linguistics, for example, the focus is on the development of computational models of human information processing. The methods used build on formal theories of linguistic syntax and logical semantics, but extend these with a variety of more performance-oriented techniques, such as probabilistic grammars and computational models of human Gestalt perception. The aim is to develop algorithms that are cognitively plausible as well as practically useful. Both are attainable by developing algorithms that model the learning process and that learn fast.

In 2008 the University Board selected the theme 'Brain and Cognition' as a Research Priority Area. The research in this priority area will be co-ordinated by *The Cognitive Science Center of the University of Amsterdam* (CSCA), in which a number of research institutes from the University of Amsterdam participate. ILLC is one of these.

The total amount of research time available in ILLC for senior staff (ud, uhd and hl) directly funded by the UvA is about 6.3 fte (see table 3 on page 37). The research time funded by NWO and the EU is about 15 fte for staff (mostly researchers at post-doc level) and 25 fte for PhD students. That is about the maximum one can expect from an institute with a senior staff of 10 fte.

ILLC's share in NWO's *Innovation Impulse* is considerable: in 2008 the institute hosted two VICI projects, five VIDI projects and four VENI projects. Add to this two Mosaic grants, one Rubicon grant, and four programmes in NWO's open competition, and it will be clear that as far as NWO is concerned ILLC's target for the next few years is to just keep funding at the level it is now.

As for funding by the European Community, there is room for improvement. In 2008 the ESF Eurocores theme LogiCCC brought us 4 PhD students and post-docs in addition to two running FP6 projects (10 FTE in total).

So far, however, we haven't been very successful in the *Seventh Research Framework Programme* (FP7), despite the fact that this offers better opportunities than the FP6, especially in the field of computational modelling.

### 1.3 Teaching and PhD training

As an interdisciplinary institute, ILLC participates in a great number of teaching programmes. In 2008 courses were given in the Beta-Gamma bachelor, the master of Rhetoric, Argumentation & Philosophy, the master of Cognitive Science and the bachelor and master tracks of Philosophy, Computer science, Artificial Intelligence, Linguistics, and Mathematics. Still, the main thrust of our teaching activities centres on the Master of Logic, a two-year international research master. The wide range of courses in logic and its applications offered in this program attracts many students from all over the world. Currently, there are about 60 active students coming from about 20 different countries.

The PhD training of ILLC takes place at a national level in collaboration with the *Dutch Graduate School in Logic* (OZSL). Internationally, ILLC is very active in the *European Foundation for Logic, Language and Information* (FoLLI). Each year FoLLI organizes the European Summer School on Logic, Language and Information (ESSLLI). All PhD students at ILLC are supposed to attend this summer school.

Most of the PhD students in ILLC are employed on a project externally funded by NWO or the European Union. About 15 PhD candidates from abroad bring their own funding, usually in the form of an individual grant from their government. Within the Faculty of Science, the director of ILLC can allocate positions for PhD students to research programmes. The budget does not allow doing this on a regular basis. Within the Faculty of Humanities, the Faculty awards a number of PhD positions each year to the research institutes. For ILLC the average is one position per year.

It is the policy of ILLC to treat these different categories of PhD students equally. The regulations are such that it is not easier to get in for students that bring their own money than for students who apply for a paid PhD position. All PhD students have only limited time to find a promotor and to develop a training and supervision plan. This plan is renewed once every year in the progress interviews that take place between the student and supervisors. Apart from this, the progress of the PhD-projects is reviewed once a year by the *Promotion Progress Committee*, which is appointed by the scientific director of ILLC. This committee, which consists of junior staff members, evaluates not only the progress of the student but also the quality of the supervision, and suggests solutions if there are any problems between the supervisor(s) and student.

So far, only three PhD students left ILLC without a doctor degree. Very few PhD students finished their work within the official time frame of four years, but the average of 56 months between starting date and exam date is pretty good in the Dutch context. The number of doctor degrees awarded in 2008 was 10, which equals the record set in 2001.

### 1.4 Administration

For at least ten years, in every annual report at least one paragraph was devoted to ILLC's awkward position in the university's administrative structure. Being part of two faculties, with two different types of financial organization, human resources management, employment regulations, and so on, creates a complicated and time-consuming administrative situation. All parties involved acknowledged that something

needed to be done about this, but it took a number of years and an appeal by the Research Evaluation Committee until measures were taken. This year, finally, the two faculties agreed to clean up the opaque relations at the level of personnel - some members of staff having two part time jobs, one in each faculty, some others with a job in one faculty but mainly working in the other, and so on. By transferring some people from one faculty to the other a situation could be created in which it is possible to develop a transparent system for the allocation of teaching resource credit, joint supervision, joint project income, etc.

Another main decision taken in 2008 concerns the future housing of ILLC. The University decided to locate all interdisciplinary activities - and ILLC is one of these - in Science Park in Watergraafsmeer. The Faculty of Science and the Faculty of Humanities agreed that ILLC would be housed in the new building in Science Park and that for ILLC members with teaching duties in the centre of town a *pied à terre* will be created in the Philosophy Department.

This solution to ILLC's housing problem is not optimal. It creates problems for ILLC members whose main teaching duties are in the centre of town, and who therefore need more than a desk in an office shared with many others (which is what the *pied à terre* amounts to) to do their work properly. It creates huge problems for our Master of Logic students, many of which will want to take both courses given in Science Park and courses given in the Oudemanhuispoort. Although these are just 'logistic' problems, not doing anything about them may cause ILLC to split, thereby destroying its unique interdisciplinary culture, and with this much of its value to the University of Amsterdam.



# Chapter 2. Research

## 2.1 Language and computation

### *Programme leaders*

Remko Scha  
Khalil Sima'an (deputy)

### *Research area*

This project is concerned with computational models of natural language processing and music perception. Its main goal is to further our understanding of the human mind by building realistic models of these cognitive processes. The ideas developed for this purpose are sometimes extended to deal with practically useful applications, such as Machine Translation. The project tries to synthesize the insights from traditional generative grammar and logical semantics with probabilistic and connectionist approaches.

A major focus of the project is the development of statistical models for natural language processing. Our work in this area deals with syntactic and morphological disambiguation, language acquisition, and automatic translation. It builds on our experience with the Data-Oriented Parsing model, which was developed and refined in this project in the course of the last fifteen years. Our current models work with monolingual and bilingual corpora which may consist of raw text or be (completely or partially) syntactically annotated. We tackle challenges such as grammar and structure induction, domain adaptation, first language acquisition and syntax-enriched machine translation. We also investigate the adequacy of the syntactic/morphological annotations in treebanks for languages with more complex morphology than English.

Another important application area is information storage and retrieval. Here we pursue system-centred as well as user-centred approaches, in ways that contribute to our understanding of the cultural and societal context of information access. We concentrate on innovative techniques which exploit textual information in combination with additional data, such as document structure, Web-link structure, and other meta-data.

In cooperation with the project 'Logic and Language', we develop models of linguistic processes at the level of pragmatics and discourse. Here we employ the framework of 'Optimality Theory' to articulate complex models as hierarchies of competing constraints.

Our research on music cognition focuses on an aspect of music which is fundamental but ill-understood: the perception of the temporal aspects of music, such as rhythm, tempo and timing. We develop computational models which implement mathematically articulated theories, and we validate these models through psychological experiments

with human listeners. The models developed here can be applied in algorithms for automatic transcription, automatic accompaniment and music generation.

Language research and music research deal with significantly different domains; they cannot be expected to use exactly the same concepts, tools, and techniques. But language and music do have important features in common: both are sign systems evolved in human society, which rely on the human ability to perceive complex hierarchical structures in linear sequences. We believe it is useful, therefore, to explore these two domains jointly. Some convergence can be observed already.

### *Developments in 2008*

#### **Probabilistic Language Processing**

An important strand of our work was involved with bridging the apparent gap between our statistical computational models and the concerns of traditional linguistic theory regarding the typological adequacy of syntactic representations. Work on the integration of syntax and morphology in Modern Hebrew and Arabic shows that it is important to model both argument order and function in order for the existing probabilistic parsing approach to work well for morphologically rich languages. Another project aims at the automatic annotation of constituency trees with head information.

In 2008, the Data-Oriented Parsing model was extended to incremental parsing and production of child language and integrated with Zuidema's "push-and-pull" method. This model was used to describe successive stages of English child-language, showing that the productive units of child language become more abstract with age. Borensztajn, Zuidema and Bod received the Best Paper Award at *Cognitive Science 2008* for the paper reporting this work.

In cooperation with Utrecht University (UiL-OTS) we work towards a language acquisition model which should simulate the developmental stages of Dutch child-language. As a first preliminary result, a grammar for early Dutch child-language was developed in 2008.

Unsupervised DOP (U-DOP) was applied to child-language data, showing that grammar properties such as auxiliary fronting can be learned from relatively small corpora of child-directed speech. U-DOP was also applied to melodic structure, language modelling for speech recognition, and language generation.

The NWO Exact project "Learning Stochastic Grammars from Unlabelled Data" came formally to an end in July 2008 with as main result the development of the "push-and-pull" method for learning parsimonious DOP models. Zuidema's VENI project "Discovering Grammar" started in October 2008 in cooperation with Leiden University.

In 2008 we also continued the search for effective kinds of prior knowledge for statistical inference of structure from mono- and multi-lingual (mainly parallel) natural language corpora in order to improve performance on tasks such as machine translation and parsing. Within Statistical Machine Translation we succeeded in formulating a well-

behaved statistical estimator that outperforms the heuristic methods used in the state-of-the-art. This estimator incorporates an Inversion Transduction Grammar prior over sentence segmentations. In joint work with Dublin City University, we improved translation accuracy by means of a new incremental parsing technique which integrates syntactic structure into a statistical machine translation model. (This work is reported in the Ph.D. Thesis of Hany Hassan co-supervised by Sima'an.) In our work on domain-specialization and adaptation of statistical parsers we achieved some improvement over existing parsers by means of a new probabilistic model that treats a domain as a collection of subdomains.

#### **Discourse and Optimality Theory**

Continuing earlier research, the main concern was to investigate the role of bidirectional optimization as a cognitive realistic mechanism of language comprehension/generation. The final aim is to come to a simple and implementable system for interpreting natural language using OT syntax, plausibility estimation, and relevance maximisation. Results in 2008 include work on rhetorical structure, connectives, and robust semantic parsing. We demonstrated how optimality-theoretic pragmatics overcomes the gap between experimental pragmatics and neo-Gricean pragmatic theory.

#### **Information Storage and Retrieval**

In the MuSeUM and README projects, we studied focused access to XML documents, where the document structure is exploited to allow very specific queries. We analyzed link and category structure in Wikipedia, and its impact on retrieval. We organized the INEX (Initiative for the Evaluation of XML Retrieval) competition and participated in various tracks. We also studied web retrieval for shallow access to large-scale web data (part of the EfFoRT project). The main results were the analysis of topical relevance feedback, and its relation to blind and relevance feedback, and to the use of category information. We also studied domain specific retrieval, with focus on cultural heritage descriptions, historic document retrieval, and legal information (part of the MuSeUM and README projects). The main results were the development of three test collections (covering a library catalogue, archival finding-aids, and a museum's register), and the development of methods for thresh-holding and information fusion.

#### **Music Cognition**

This research is concerned with the computational modelling of music perception and production with a special focus on the temporal aspects of music such as rhythm, timing, and tempo. In 2008 most activity was centred around two projects: a) the finalization of the EmCAP (FP6-IST) project and b) improving the visibility of music cognition research.

The aim of the EmCAP project was to investigate the emergence of cognition and the development of effective representations through interactions with an environment. The project finished in September 2008. Overall, the project was evaluated as “good to excellent”, with the ILLC-workpackage (WP5) being evaluated as “excellent”. Publications by WP5 included reports on emergent meter, expectancy, syncopation and complexity, the role of exposure and expertise, and a number of methodological studies. The project yielded some new empirical results: (1) mere exposure (not expertise)

influences expressive timing judgements in music; and (2) beat induction is innate.

In 2008 the music cognition group devoted much attention to the visibility of music cognition research. The group participated in the Academische Jaarprijs competition (promoted under the title "The Battle of the Universities", which is an initiative of NWO, KNAW and the newspaper NRC Handelsblad. Furthermore, Henkjan Honing presented at the prestigious *Spinoza te Paard lecture series* organized by NWO (and several media partners) intended to communicate recent scientific results to a general audience.

Also in 2008, in cooperation with biologists at Leiden University, we worked on a project which employs the conceptual tools of formal language theory to study the structure of bird song.

### *Perspectives and expectations*

We expect major progress in the development of models for first language acquisition, as complementary insights and techniques from empirical studies, Data-Oriented parsing, and grammar induction will be integrated.

In Statistical Machine Translation we expect major steps towards the induction of hidden hierarchical structure to improve translation quality and to shed light on some aspects of compositional translation. We also expect results pertaining to the role of linguistic knowledge (morphology and syntax) in generalizing over the parallel data by learning a generative description of translational equivalents instead of the fixed dictionary method that currently dominates the state-of-the-art. We also expect new results pertaining to research on domain-adaptation of parsers and the role of lexical descriptions in achieving effective adaptation. Furthermore, new results regarding the parsing of Semitic languages are expected (the Ph.D. Thesis of Reut Tsarfaty).

In information retrieval, we envision substantial progress in the creation of gold standards for evaluation, through the INEX initiative and in a SIGIR Workshop jointly organized by the evaluation fora (TREC, CLEF, NTCIR, INEX). We will extend ongoing research concerning the usefulness of contextual information, such as category information and links evidence, by covering various types of data and retrieval tasks (retrieving documents, document-parts, and entities).

In music cognition, we intend to move from empirical investigations towards computational models. In doing this, parallels with exemplar-based models of language cognition will be explored. In collaboration with the Information Retrieval researchers, work on Music retrieval will be initiated. Henkjan Honing was awarded an NWO grant to write a book on music cognition for a general audience. It will be published in the autumn of 2009.

An emerging topic is the relation between our symbolic models and their connectionist implementations. This applies to the probabilistic models as well as to the optimality-theoretic ones.

### *Internal and external cooperation*

- Probabilistic Language Processing: St. Andrews University, Scotland.
- Linguistics and Bird Song: Leiden University.
- Language Acquisition: UiL OTS (Utrecht University).
- Statistical Machine Translation and Parsing: Dublin City University, IBM Cairo (Egypt), IBM T.J.Watson Research Laboratories (USA).
- Learning for domain adaptation for parsers: Groningen University (NL).
- Corpora and Parsing for Modern Hebrew and Arabic: Technion (Haifa), Ben Gurion University of the Negev (Beer Sheva), Utrecht University (NL).
- Image Parsing: Computer Science Institute, UvA.
- Discourse and Optimality Theory: Radboud Universiteit Nijmegen, Rijksuniversiteit Groningen, Potsdam University (Germany), Stuttgart University (Germany).
- Information Retrieval: Informatics Institute (UvA).
- Web search: University of Twente.
- Cultural heritage retrieval: Gemeentemuseum Den Haag, Koninklijke Bibliotheek, Nationaal archief.
- XML retrieval: University of Glasgow (Scotland), Queensland University of Technology (Australia), University of Otago (New Zealand).
- Music Cognition: Centre for Theoretical and Computational Neuroscience (University of Plymouth), Fundació Barcelona Media (Universitat Pompeu Fabra), Institute for Psychology (Hungarian Academy of Sciences).

### *Prizes and Awards 2008*

Bod, L.W.M., Borensztajn, G. en Zuidema, W.M.

- Best Paper Award for Applied Modeling, CogSci 2008, Washington D.C..

### *Professional distinctions, memberships of scientific boards, etc.*

Bod, L.W.M.

- Member of the Engineering and Physical Sciences Research Council Peer Review College.
- Member of the program committee for the fourth Workshop on Psychocomputational Models of Human Language Acquisition (PsychoCompLA 2008).
- Member program committee the annual meeting of the Cognitive Science Society (CogSci 2008).
- Member Associate Reviewers of Cognitive Science.

Honing, H.J.

- Vice-President of the European Society for the Cognitive Sciences of Music (ESCOM).

Kamps, J.

- Co-chair of the INitiative for the Evaluation of XML Retrieval (INEX).
- Co-chair of the SIGIR 2008 Workshop on Focused Retrieval, Singapore.
- Co-chair of the Seventh Workshop for the INitiative for the Evaluation of XML Retrieval (INEX), Schloss Dagstuhl.
- Member of the Program Committee for the Continuous Access To Cultural Heritage (CATCH) 2008.
- Senior expert at the SIGIR Doctoral Consortium, Singapore, July 20, 2008.
- Member of program committee for the Seventeenth ACM Conference on Information and Knowledge Management (CIKM) 2008.
- Member of the Program committee of the 31st Annual International ACM SIGIR Conference on Research & Development on Information Retrieval (SIGIR) 2008.
- Member of the Program for the ACM Conference on Information Interaction in Context (IIIX) 2008.
- Member of the Program Committee for the Workshop on Language Technology for Cultural Heritage Data (LaTeCH) 2008.
- Member of the Program Committee for the workshop on Information Access to Cultural Heritage (IACH 2008).

Sima'an, K.

- Member of the Program Committee for the Annual Meeting of the Association for Computational Linguistics (ACL) 2008.
- Member of the Program Committee for the Computational Linguistics Conference (COLING) 2008.
- Member of the Program Committee for the International Joint Conference on Natural Language Processing (IJCNLP) 2008.
- Member of the Program Committee for the European Summer Schools for Logic, Language and Information, ESSLLI 2008.
- Member of the Program Committee for the Belgium-Netherlands Artificial Intelligence Conference (BNAIC) 2008.

### *Editorial positions*

Blutner, R.

- Mouton Series in Pragmatics.
- Semantics and Pragmatics.

Honing, H.J.

- Empirical Musicological Review.
- Journal of New Music Research.
- Music Perception.
- Music Theory Spectrum.

Sima'an, K.

- European chapter of the ACL (EACL'06).

- Journal of Computational Linguistics.
- Journal of Science of Computer Programming.

Zeevat, H.

- Journal of Semantics. Researchers and other personnel 2008

**Researchers**

POSITION	NAME	UvA	NWO	EU	None	Total
Full professor	Scha	0.40				0.40
Associate professor	Bod		1.00			1.00
	Honing	0.43				0.43
	Zeevat	0.40				0.40
Assistant professor	Blutner	0.45				0.45
	Kamps		1.00			1.00
	Sima'an		1.00			1.00
Postdoc	Arampatzis		1.00			1.00
	Deoskar		0.15			0.15
	Frank		1.00			1.00
	Seginer		0.33			0.33
	Smith			0.68		0.68
	Zuidema		0.34			0.34
PhD student	Borensztajn		1.00			1.00
	de Bruin		0.63			0.63
	Fachry		0.75			0.75
	Kaptein		1.00			1.00
	Koolen		1.00			1.00
	Ladinig			1.00		1.00
	Mylonakis		0.75			0.75
	Sangati		0.96			0.96
	Tsarfaty		0.75			0.75
	Zhang		0.75			0.75
Guest PhD student	Cochran				0.75	0.75
	Perquin				0.40	0.40
Total		1.68	13.40	1.68	1.15	17.91

## 2.2 Logic and Computation

### *Programme leaders*

Jouko Väänänen  
Leen Torenvliet (deputy)

### *Research area*

A central research theme in both mathematics and computer science is inspired by the desire to understand the nature of computation. Logic can be an ideal tool for this research. On the one hand logical tools can be used to interpret the meaning and study the complexity of behavioural processes that involve computation, and on the other hand a logical reasoning itself can be viewed as a computational process. Thus viewed, computational processes ranging from formal reasoning, through the formalization of parts of mathematics, to implementations of algorithms for practical problems can be united under the title “Logic and Computation.” Our group, in which expertise throughout the broad spectrum ranging from pure mathematics to applied computer science is present, intentionally has the mix that fits this subject perfectly.

Along the line that runs from mathematical logic to applied computer science, the various ongoing projects can be classified into the categories Sets and Models, Games and Interaction, Algebra and Coalgebra and Computation and Complexity. Yet many horizontal connections between these subjects are created and dissolve again during the research process. Persistent horizontal connections between the sub programmes are games which can be both an object of study and a model of computational processes involving agents, and complexity which is omnipresent in many subjects involving computational behaviour.

The sub programme Sets and Models constitutes a firm mathematical foundation of the project. Set Theory and Model Theory are fundamental mathematical theories. Here, games also play an important role, as for example infinitary games may model infinitary combinatorial processes. Subjects in this programme are determinacy axioms, infinitary games, transfinite and multiplayer games, generalized quantifiers and abstract logics. Through various applications in natural language, descriptive complexity and modal logic and even connections to medieval logic, this sub programme is closely connected to other lines of research in the project.

The process of interaction between many agents, human or otherwise, can be viewed as a computational process in which information is created. To this process, game theoretical techniques can be applied to learn more about what is computed and how. The sub programme Games and Interaction studies these processes using techniques from modal logic, computer science and game theory. In addition, border areas between logic and socio-economic science, in which parallel lines of research can be found, are explored.

The sub programme Algebra and Co-algebra is pivotal in this project. On the logic side it heavily depends on, uses and extends techniques of modal logic and on the application



side, many fundamental phenomena in computer science (automata, transition systems), and mathematics (non-well-founded sets, power series) have in fact a very natural modeling as state-based coalgebras. This explains the emergence of coalgebra as a general mathematical framework with the potential of a deep unification of many concepts pertaining to evolving or dynamic systems.

Over time the research area of Computational Social Choice has developed into a separate subprogramme in this project. Its central theme, collective decision making, ties in with economics, game theory, complexity theory and combinatorics. The project is currently funded through a Vidi grant and will be further expanded in 2009 through a LogiCCC grant. It has attracted many junior researchers and has accumulated an active community.

Research in the area of Computation and Complexity is carried for a large part by faculty who have their main appointment at CWI. Computational and structural complexity have been research subjects that were shared by CWI and ILLC for a number of years. Kolmogorov Complexity, Machine Learning and Quantum Computing are subjects that solely carried by the aforementioned faculty. In 2008 investigations in the field of bioinformatics were started and on the side of the ILLC a new senior faculty member with expertise in the field of randomness was appointed.

### *Developments in 2008*

#### **Sets and Models**

Cooperation with Apter and Jackson in the project “Infinitary combinatorics without the axiom of choice” led to a proof of the consistency of all nontrivial patterns of measurability on the first three uncountable cardinals. On a visit to Kobe (Japan) we solved an open problem on the eventually different topology. The formalization of stories was continued in the setting of games and AI and together with Pacuit and an Indian intern we worked out a formal system for crime stories. This result was presented at the AP-CAP meeting in Bangalore, December 2008. Empirical research in the context of philosophy of mathematics was continued with an interview study of mathematicians, and the successful series of workshops in the network PhiMSAMP was continued. In Heidelberg we presented joint work with Müller on data/phenomena distinction and the technique of conceptual modelling and Work on the peer review system in mathematics, a collaboration with Van Kerkhove was started this year. Finally, a new ESF project called DiFoS was started in which research will be done on the relationship between obligations and dialogical semantics.

The group continued developing dependence logic in new directions such as probabilistic logic. The group belongs to the ESF Eurocores Program LogICCC with project LINT (Logic for Interaction) in which dependence logic, developed at ILLC is in important role. Several new results about dependence logic, related e.g. to probabilistic logic, compositionality and computational complexity, were obtained.

In cooperation with Abramsky (Oxford) the group established a surprising connection between dependence logic and intuitionistic logic.

The work of the group, in co-operation with L. Hella (Tampere) developed a new Ehrenfeucht game that measures the expressive power of a formula in terms of the length, rather than the quantifier-rank of the formula, which seems quite useful for applications.

The group continued vigorously the study of trees as a measure of length of a transfinite Ehrenfeucht tree, something one can use, as the group has earlier shown, to classify uncountable structures. The work in this direction was focused on trees of singular cardinality which was previously unexplored. The work was carried out in cooperation with M. Dzamonja (Norich) and led to almost conclusive results.

The group was instrumental in establishing cooperation in set theory on the European level. An ESF Research Network INFTY (New Frontiers of Infinity: Mathematical, Philosophical and Computational Prospects), initiated by the group, was approved in ESF. The group was active in many ways, for example in organizing a mini-symposium, in the Fifth European Mathematical Congress in Amsterdam.

#### **Games and Interaction**

Research on the dynamic-epistemic foundations of information flow continued with its program of developing a total logical picture of interacting information-processing agents. A new structural characterization was found for priority belief update in temporal logic, as well as new completeness results for protocol-based informational processes over time. Moreover, a new modelling was proposed to deal with the information flow in deduction, which had remained outside the scope of dynamic-epistemic methods so far. Application to games continued with the design of new logics for changing games under various sorts of hard and soft information, providing new perspectives on game solution algorithms. These systems were extended to explicit logics of strategies that can be changed as play proceeds. Finally, contacts with social themes continued, with a systematic survey of computational complexity of logics for group structure, as well as a study of protocol-based social processes that generate common knowledge or common belief.

#### **Algebra and Coalgebra**

In 2008 the VICI project ‘Algebra and Coalgebra’ was almost in full swing. The group organized a workshop on Modal Fixpoint Logics in March 2008, and had many visitors, of whom Guram and Nick Bezhanishvili, Alexander Kurz, and Luigi Santocanale stayed for extended periods. With Kurz, Alessandra Palmigiano and Yde Venema edited a special issue of the Journal of Logic and Computation on Logic and Coalgebra.

A fundamental result in coalgebraic logic was obtained in collaboration with Clemens Kupke and Alexander Kurz. This team found a sound and complete axiomatization for the finitary version of Moss’ coalgebraic logic, in the setting of coalgebras for an arbitrary weak pullback preserving set functor. For the special case of the power set functor, nice proof systems were developed in collaboration with Marta Bílková. The group also developed translation techniques to compare various kinds of coalgebraic modal logics, and developed an elementary construction of final coalgebras that works on any monadic category over Set.

Other results obtained in 2008 include the observation (with Nick Bezhanishvili) that the Vietoris functor does not preserve weak pullbacks, and a generalization (with MSc student Loes Olde Loohuis) of the Stone and Jónsson Tarski representation theorems to a multi-player setting. Research into the relation between topological algebras and Stone duality yielded a duality result for image-finite Kripke frames. In collaboration with Ramon Jansana and Mai Gehrke, the group merged the theory of canonical extensions with that of abstract algebraic logic, focusing on issues related to posets. Investigations into the modal mu-calculus led to a syntactic characterization of the continuous fragment.

Research in the semantics of propositional logics supported by computer programs continued. New software was developed to obtain results in intermediate logics, unification in modal logics and extensions of intuitionistic propositional logic with new connectives. In cooperation with Akin Kazakci, CGS Ecole des Mines de Paris, a start was made with the development of a formal framework for Design Theory.

#### **Computational Social Choice**

Work in 2008 has continued to emphasize topics such as compact preference representation languages, multiagent resource allocation, combinatorial auctions, and voting theory. We have also begun to investigate opportunities for modeling classical impossibility theorems from social choice in first-order logic, with a view towards exploiting automated reasoning tools in this area. In work on multiagent systems, we have proposed an extension of the standard Belief-Desire-Intention programming framework by incorporating learning into the selection of intentions.

Various aspects of strategic games, including graphical games and games with partial knowledge of the game structure have been investigated focusing on the role of Nash equilibria and iterated elimination of dominated strategies.

Research on these topics was carried out in cooperation with colleagues from the University of Padova, Italy; the University of Paris-Dauphine, France; the French Aerospace Lab (ONERA), Toulouse, France; the Artificial Intelligence Research Institute (IIIA-CSIC), Barcelona, Spain; the University of Barcelona, Spain; the Universitat Pompeu Fabra, Barcelona, Spain; RMIT University, Melbourne, Australia; and the University of Tulsa, USA. In cooperation with Duke university and the University of Athens the group studied the maximization of the social welfare in simultaneous and in sequential mechanisms.

#### **Computation and Complexity**

A project on logic and probability was taken over from Vienna and continued in Amsterdam. Cooperation with Hirschfeldt on constructive measure appeared in 2008. Several papers on connections between computational lattices and constructive logic, one with Sorbi, appeared in 2008. The initial study on non-uniform reductions appeared in journal in 2008. This work will be continued and extended. A new operator called monotone primitive recursion was introduced in the paper “Implicit definitions of complexity classes,” presented at CiE2008. This operator gives new implicit characterizations of the polynomial hierarchy, in particular of Delta2 similar to Cai and Furst’s constant-width bottleneck machines.

In the field of Machine Learning, we showed that in model selection according to the

minimum description length criterium in statistics for on-line data streams  
we should not switch from one model to the other when the MDL code of the one becomes shorter than the other, but already when the difference starts to diminish. This gives a novel insight in the area of model selection, and solves a long-standing issue in statistics, known as the AIC-BIC dilemma. A framework was created to express strategies for combining expert advice. This framework unifies existing algorithms and allows for the design of an efficient algorithm for “Switch Distribution.”

The third edition of the standard reference textbook and ongoing bestseller, “An introduction to Kolmogorov Complexity and its Applications” was published. More than half of the existing material has been updated.

In Quantum Computing with Briet and Toner, a new generalization of Grothendieck’s constant was defined and a first lower bound was proved. Using this, they proved that for any entangled state shared between two players, there exists nonlocal games such that the state has insufficient entanglement to allow the game to be played optimally. This confirms a conjecture of Brunner et al.

In 2008 cooperation with van der Gullik was expanded in the field of computational biology. The project investigates error robustness of the genetic code. Buhrman, of our group, is involved in three other projects in computational biology that started in 2008.

### *Perspectives and expectations*

The research into medieval logic will be continued in 2009 through a postdoc position for Sara Uckelman. The new ESF Research Network INFTY (New Frontiers of Infinity: Mathematical, Philosophical and Computational Prospects) will be in full activity in 2009. An ESF Mathematics Conference in Partnership with EMS and ERCOM, The Second European Set Theory Meeting: In Honor of Ronald Jensen, organized by the group, will herald new cooperation in set theory in Europe in 2009, highlighted by a special semester of set theory and set theoretic model theory organized by the group in cooperation with partners from California, Sweden and Norway, in the Mittag-Leffler Institute of the Royal Swedish Academy of Science in the fall 2009. At the same time the group is active in organizing a European Set Theoretic Society.

In the Algebra and Coalgebra project the investigations will be continued into the expressivity of, and proof systems for coalgebraic modal logic. Also, the group will make more extensive studies of the expressivity of fragments and variants of the modal mu-calculus, and will continue its research into quantales and topological algebras. The group will organize a conference on Topology, Algebra, and Categories in Logic.

One of the three LogiCCC project grants awarded to the Logic & Computation section addresses problems in computational social choice and will start in 2009. Members of the group will continue to be involved in the European ESF-COST network on Algorithmic Decision Theory, as well as the organisation of the COMSOC workshop series. In 2009, more research will be done into mechanism design and game theory, and an already started research into social networks will be continued. With de Boer and Olderog, a third edition of the book “Verification of Sequential and Concurrent Programs” will be published.

The ESF Eurocores Program LogiCCC project LINT (Logic for Interaction) will continue vigorously in 2009 with cooperation of the LINT partners and also more widely with the LogiCCC partner projects. There are plans to extend Inference and Update that

focuses on beliefs and related concepts to belief revision. In Machine Learning, the existing framework will be extended for combining expert predictions.

### ***Prizes and Awards 2008***

Bentham, J.F.A.K., van

- Henry Waldgrave Stuart Professor of Philosophy, endowed chair Stanford.

Gierasimczuk, N.

- The Foundation for Polish Science Award for Young Researchers.

Vitányi, P.M.B.

- International Federation for Information Processing (IFIP) Silver Core Award.

### ***Professional distinctions, memberships of scientific boards, etc.***

Apt, K.R..

- Member of the program committee for the 7th International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS) 2008.
- Member of the program committee for the 8th Conference on Logic and the Foundations of Game and Decision Theory (LOFT) 2008.
- Member of the Council of the European Association for Theoretical Computer Science (EATCS).
- Member of the Advisory Board of the Book series 'Texts in Logic and Games' of the Amsterdam University Press.
- Member of the Advisory Board of the Computing Research Repository (CoRR).
- Member of the Steering Committee of the European Science Foundation Network 'Games'.

Bentham, J.F.A.K., van

- Member, Academia Europaea.
- Member, Hollandse Maatschappij van Wetenschappen.
- Member, Institut International de Philosophie.
- Member, Royal Dutch Academy of Sciences.
- Doctor honoris causa: Université de Liège.
- First honorary member, European Association for Logic, Language and Computation (FoLLI).
- Distinguished visitor, Taiwan Research Council.
- International Who's Who.
- Spinoza Award, Dutch National Science Organization NWO.
- University Professor, University of Amsterdam.
- Henry Waldgrave Stuart Chair of Philosophy, Stanford University
- Weilun Professor of Humanities, Tsinghua University, Beijing.
- Visiting Professor, JAIST Japanese Advanced Institute of Science and

- Technology, Kanazawa, Japan.
- Visiting University Professor, Soon Yat-sen University, Guangzhou.
  - Vice-President, International Federation of Computational Logic
  - Board of Directors, Theoretical Aspects of Rationality and Knowledge (TARK).
  - Steering Committee, Workshop on Logic, Rationality and Interaction (LORI).
  - Steering Committee, Workshop on Logic, Language, Information and Computation (WoLLIC).
  - Council Member, Indian Logic Association.

Buhrman, H.M.

- Chair of the programme board for Computer Sciences, Lorentz Center.
- Member of the board of the Dutch Association for Theoretical Computer Science (NVTI).
- Member of the programme committee for The Twelfth Workshop on Quantum Information Processing (QIP) 2008.
- Member of the programme committee for The 49th Annual Symposium on Foundations of Computer Science (FOCS) 2008.
- Member of the programme committee for The 12th International Workshop on Randomization and Computation (RANDOM) 2008.
- Member of the programme committee for The 5th IFIP International Conference on Theoretical Computer Science (TCS) 2008.
- Member of the programme committee for The 3rd International Computer Science Symposium in Russia (CSR) 2008.
- Member of the scientific board of the Institute for Quantum Computing Waterloo (IQC) 2008.
- Member of the Quantum Information Processing Advisory Committee, Canadian Institute for Advanced Research (CIFAR).
- Member of the QUROPE governing board (EU, Coordination action project).

Emde Boas, P., van

- Member of the Steering Committee of Computability in Europe (CiE).

Endriss, U.

- Vice Chair of the European COST Action IC0602 on Algorithmic Decision Theory.
- Co-chair of the 2nd International Workshop on Computational Social Choice (COMSOC-2008)
- Senior Member of the Programme Committee for the 7th International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS-2008)
- Member of the Programme Committee for the 18th European Conference on Artificial Intelligence (ECAI) 2008.
- Member of the Programme Committee for the 23rd AAI Conference on Artificial Intelligence (AAAI) 2008.
- Member of the Programme Committee for the 11th International Conference on Principles of Knowledge Representation and Reasoning (KR) 2008.

- Member of the Programme Committee for the 9th ACM Conference on Electronic Commerce (ACM-EC) 2008.

Löwe, B.

- Chairman of the Steering Committee, CiE-CS (Computability in Europe Conference Series).
- Vice-President of the Deutsche Vereinigung für Mathematische Logik und für Grundlagenforschung der exakten Wissenschaften (DVMLG).
- Member of the Scientific Council of the European Association for Computer Science Logic (EACSL).
- Local co-chair of the programme committee for the European Summer School in Logic, Language and Computation (ESSLLI) 2008.
- Chair of the Organization Committee of the European Summer School in Logic, Language and Computation (ESSLLI) 2008.
- Chair of the Program Committee for the 8th Conference on Logic and the Foundations of Game and Decision Theory (LOFT) 2008.
- Member of the Program Committee for the Third Indian Conference on Logic and its Applications (ICLA) 2009.
- Member of the Council of the Association for Logic in India (ALI).
- Scientific Coordinator of the Amsterdam node of the Erasmus Mundus External Cooperation Window Lot 15: India (EMECW15).
- Member of the Advisory Council of the ACM Special Interest Group Logic and Computation (SIGLOG).
- Member of the Board of the Association for Computability in Europe.
- Member of the Program Committee for Computability in Europe (CiE) 2008.
- Member of the Scientific and Organizing Committee for the Foundations of the formal sciences (FotFS VII) 2008.
- Member of the Program Committee for the 18th EACSL Annual Conference on Computer Science Logic (CSL) 2008.
- Symposium Chair "Logic and the Simulation of Interaction and Reasoning" at the AISB Convention, Aberdeen.
- Mini-Symposium organizer "E. W. Beth Centenary Mini-Symposium on Mathematical Logic" at the 5<sup>th</sup> European Congress of Mathematics.

Palmigiano, A.

- Member of the Organization Committee for the Workshop on Modal Fixpoint Logics (MFL) 2008.

Torenvliet, L.

- Board Member of the Dutch Association for Theoretical Computer Science.
- Member of the Program Committee 8<sup>th</sup> International Conference on Cellular Automata in Research and Industry (ACRI) 2008.

Väänänen, J.

- Treasurer of the European Mathematical Society.

- Executive Committee member of the European Mathematical Society.
- Member of the board of the European Mathematical Foundation.
- Executive Committee member of the Association for Symbolic Logic (ASL).
- President of the Committee of Logic in Europe (ASL).
- Member of the Founding Committee of the European Set Theory Association (EST).
- Member of the Finnish Academy of Science and Letters.

Venema, Y

- Member of the Steering Committee of Advances in Modal Logic.
- Chair of the Organizing Committee of Modal Fixpoint Logics (MFL) 2008.
- Member of the Steering Committee of Topological and Algebraic Methods in Logics.

Vitányi, P.M.B.

- Member Gödel Prize Committee.
- Member of EU NoE PASCAL II, and the Netherlands Bsik/BRICKS project.
- International Federation for Information Processing (IFIP) WG 1.2 Description Complexity
- Co-chair of the International Federation for Information Processing (IFIP) WG 1.4 Computational Learning Theory

### *Editorial Positions*

Apt, K.R.

- Logical Methods in Computer Science (LMCS).
- Theory and Practice of Logic Programming (TPLP).
- ACM Transactions on Computational Logic (TOCL),
- Journal of Logic and Computation.

Benthem, J.F.A.K.. van

- Managing Editor, Who's Who in Logic.
- Managing Editor, Synthese.
- Managing Editor, Transactions on Computational Logic.
- Editor-in-Chief, Texts in Logic and Games.
- Nominating Editor, The Philosopher's Annual.
- Member of Editorial Board, Journal of Philosophical Logic.
- Member of Editorial Board, Studia Logica.
- Member of Editorial Board, Logic Journal of the Interest Group in Pure and Applied Logics.
- Member of Editorial Board, Logic and Computation.
- Member of Editorial Board, Language and Computation.
- Member of Editorial Board, Logic, Epistemology, and the Unity of Science.
- Member of Editorial Board, Knowledge, Rationality and Action.
- Member of Editorial Board, Lecture Notes in Logic, Language and Information (LNLLI).
- Member of Editorial Board, Theoria.



- Member of Editorial Board, Universal Logic.
- Advisory Editor, Studies in Logic.

Emde Boas, P. van

- Information and Computation.
- RAIRO Informatique theorique et applications.

Endriss, U.

- Associate Editor, Journal of Autonomous Agents and Multiagent Systems.

Löwe, B.

- Member of the Editorial Board, Journal of Logic, Language and Information.
- Managing Editor, Texts in Logic and Games (TLG).
- Managing Editor, Tbilisi Mathematical Journal.
- Member of the Editorial Team, Abhandlungen aus dem Mathematischen Seminar der Universität Hamburg.
- Scientific Editor, ILLC Publications.

Torenvliet, L.

- Journal of Universal Computer Science.

Väänänen, J.

- Notre Dame Journal of Formal Logic.
- Logica Universalis.

Venema, Y.

- Logical Methods in Computer Science.
- Springer Book series on Logic, Language and Information.
- Journal of Logic and Computation, in the area of Algebraic and Coalgebraic Logic.

Vitányi, P.M.B.

- Entropy.
- Frontiers in Computing Systems Research.
- Information Processing Letters.
- International Journal of Foundations of Computer Science.
- Journal of New Generation Computer Systems.
- Parallel Processing Letters.
- Theory of Computing Systems.

**Researchers**

POSITION	NAME	Funding				Total
		UvA	NWO	EU	None	
Full professor	Apt	0.10				0.10
	van Benthem				0.50	0.50
	Buhrman	0.10				0.10
	van Emde Boas	0.40				0.40
	Väänänen	0.37				0.37
	Vitanyi	0.10				0.10
Associate professor	Torenvliet	0.50				0.50
	Venema		1.00			1.00
Assistant professor	Endriss		1.00			1.00
	Löwe	0.50				0.50
	Palmigiano		0.08			0.08
	Terwijn	0.17				0.17
Postdoc	Airiau		0.60			0.60
	Liu	0.75				0.75
	Palmigiano		0.75			0.75
PhD student	Dégremont			1.00		1.00
	Fontaine		0.75			0.75
	Galliani		0.22			0.22
	Gheerbrant			1.00		1.00
	Gierasimczuk	0.69				0.69
	Grandi		0.16			0.16
	Ikegami			0.75		0.75
	Keskinen	0.75				0.75
	Khomskii		0.75			0.75
	Kontinen	0.50				0.50
	Kurzen		0.75			0.75
	Leal Rodriguez		0.75			0.75
	Liu	0.13				0.13
	Uridia	0.19				0.19
	Vosmaer		0.75			0.75
	Witzel			1.00		1.00
	Zvesper			1.00		1.00
Uckelman, S.		0.31			0.31	
Uckelman, J.			1.00		1.00	

Guest PhD student	Briët		1.00	1.00		
	van Erven		1.00	1.00		
	García Soriano		0.75	0.75		
	Gierasimczuk		0.08	0.08		
	Koolen-Wijkstra		1.00	1.00		
	Loff		0.33	0.33		
	Minica		1.00	1.00		
	Penedones					
	Fernandes		0.50	0.50		
	de Rooij		0.67	0.67		
	Unger		0.71	0.71		
	Velazquez-Quesada		1.00	1.00		
	Wehner		0.33	0.33		
Uckelman, S.		0.58	0.58			
Guest researcher	Baltag		0.17	0.17		
	Hendriks		0.20	0.20		
	Ju		0.92	0.92		
	Kennedy		1.00	1.00		
	Kurz		0.58	0.58		
	Niekus		0.20	0.20		
	Samet	0.42		0.42		
	Smets		0.17	0.17		
van Ulsen		0.00	0.00			
	Total	5.65	7.87	5.75	12.69	31.96

## 2.3 Logic and Language

### *Programme leaders*

Frank Veltman  
Paul Dekker (deputy)

### *Research area*

*Logic and Language* (LoLa) is a broad research programme in logic and the philosophy of language, crossing the borders of linguistics, cognitive science and the behavioural sciences. Human reasoning and the interpretation of natural language are the major themes. Logical and philosophical analysis is the basic scientific method. Empirical ratification of analytical work is the main touchstone for success. Binding force is the conviction that interpretation should be studied as a dynamic cognitive process that is embedded in both social practices and the external environment. Hence, the integration of semantics and pragmatics is a dominant long-term research aim. The various systematic investigations concentrate on empirical phenomena that are intrinsically related to the way in which information is structured in conversations.

Our view on how logic and language connect has obvious philosophical roots in the writings of Aristotle, Leibniz, Frege, Wittgenstein, Montague, and Grice. Systematic and historical study of the works of these intellectual forebears forms a substantial part of the project, also to stimulate critical reflection on current systematic research.

In our investigations of reasoning processes we aim to show that logical languages can be fruitfully used as high-level specifications of cognitive functions, and that formal logic can be used in explaining informal human reasoning. To achieve this logical and computational models are paired with methods from empirical psychology and neuroscience. The outlook on interpretation as a cognitive process embedded in social practices also makes a strong bond between interpretation and reasoning on the one hand and the evolution of rational human behaviour on the other.

### *Developments in 2008*

#### **Semantics and Pragmatics.**

When semanticists refer to the *Amsterdam School* in semantics they usually have in mind the work done at ILLC on dynamic semantics that started in early nineties and has since been at the center of our activities. In 2008 an overview article on dynamic semantics for the Handbook of Semantics was written by Paul Dekker, who also developed a canonical presentation of the Amsterdam style framework.

A new impulse to the research on interrogatives was given by Jeroen Groenendijk who in collaboration with a number of his students developed a system of *inquisitive semantics* in which the meaning of a sentence has two aspects; what matters is not only the new information it gives but also the new issues it raises. The first applications of this theory are under way as it provides a natural framework for dealing with phenomena like topic and focus. (For more information, see <http://sites.google.com/site/inquisitivesemantics/>)

Another application of dynamic semantics is to be found in the dissertation of Fabrice Nauze, who investigated the category of modality from a typological perspective and used the results as input for a formal semantic theory that explains among other things the restrictions on the combinability of different kinds of modality in one sentence.

This dissertation marks an important development, as it is the first fruit of a collaborative effort between the LoLa group and a group of researchers of ACLC, the linguistics institute of the University of Amsterdam. This cooperation got an official status by the establishment of a research group on *Crosslinguistic Semantics* which has set itself two aims: (i) the documentation of crosslinguistic semantic variation through typological research; (ii) the modeling of semantic variation in explicit formalizations. This initiative was rewarded by the Faculty of Humanities by providing funding for a PhD position for Hadil Karawani to work on a ‘Crosslinguistic study of Mood as Means for Expressing Counterfactuality. A second project that belongs to this area is the VIDI project of Maria Aloni on ‘Indefinites and beyond; evolutionary pragmatics and typological semantics’ that started this year with Katrin Schulz as postdoc and Angelika Port as PhD student. The project includes a number of synchronic and diachronic studies of indefinite words in various languages and develops formal models of their variation in meaning and use. Writing a dissertation on semantics in Amsterdam does not necessarily mean one has to go dynamic, not even when the topic of the thesis is the resolution of anaphora and the promotor is Jeroen Groenendijk, witness the thesis of Floris Roelofsen, which was in great part inspired by the work of the late Tanya Reinhart.

The research agenda in the area of pragmatics is still determined by the question of how to give a game theoretic account of implicatures. Robert van Rooij and his students looked at the maxim of Relevance in situations where speaker and hearer interest diverge, thus extending the scope of linguistic pragmatics beyond cases of pure cooperation.

#### **Logic and Cognition.**

The year 2008 has been a very productive year for the human reasoning area in the LoLa programme. Marian Counihan finished her thesis ‘Looking for logic in all the wrong places: an investigation of language, literacy and logic in reasoning’. She investigated the semantic aspects at play in language-based reasoning tasks, and used this to argue that psychology of reasoning research has by and large generated overly negative conclusions about our reasoning abilities. The work on the logical modeling of discourse processing and its ramifications for behavior and neuroimaging has led to papers on EEG patterns in the processing of non-monotonic linguistic constructions, in the particular the English progressive (*J. Memory and Language*), non-monotonic reasoning in autism (*Neuropsychologia*) and use of verb tense in ADHD (*Journal of Logic, Language and Information*). Much of the theory behind these applications can be found in the book by Keith Stenning and Michiel van Lambalgen ‘Human reasoning and cognitive science’ (MIT Press 2008). To quote from an endorsement: “This deep and stimulating book, by a leading psychologist and a leading logician, is about the choice of logical formalisms for representing actual reasoning. There are two interlocking questions: what are the right formalisms to represent how people reason, and what forms do the reasoners themselves bring to the world in order to reason about it? The authors’ answer to the first question, using closed-world reasoning, allows them to analyze the wide range of strategies that people use for shaping their thinking. For example, the book uncovers important links between autism and nonmonotonic reasoning. This may be the first book in cognitive

science that logicians can learn some new logic from.” (Wilfrid Hodges, Queen Mary, University of London)

#### **Philosophical Foundations.**

The two doctoral dissertations that appeared in this area in 2008 underline the importance of Wittgenstein’s work for the LoLa group. There was Erik Rietveld’s penetrating study on unreflective action and its import for philosophy and neuroscience, part of which was published in *Mind*. And Tine Wilde finished her project on Wittgenstein’s notion of *übersichtliche Darstellung* and related to this the phenomenon of Installation in visual art. Her project has been unique in that it really *combined* philosophy and art, and to mark this the defence began with a special ‘promotion’ performance.

New in this area is the project on the philosophical and methodological foundations of formalisation in logic, carried out by Catarina Dutilh Novaes on a VENI grant of NWO. New, too, is Michiel van Lambalgen’s investigation of Kant’s logic, which has the reputation of being stale and dry, and in any case superseded by modern predicate logic. It turns out, however, that Kant’s logic is actually very subtle and requires for its formalisation techniques that were developed only in the late 20th century.

#### ***Other activities***

Many of the group members participate in the local colloquia, such as the DIP, LEGO, and GLoRiClass meetings. The PhD students attend the ILLC logic tea and the philosophy student’s lunch. Many members are also active in summer schools (mostly ESSLI) as a participant, or as a reviewer, in the program committee or standing committee. The group members play an important role to the organisation of the Amsterdam Colloquium, the Seminar on logic, language & reasoning, the Tbilisi Symposia, the Szklarska Poreba workshops, and the PALMYR conferences. A new initiative was the organisation of the 1<sup>st</sup> Graduate Philosophy Conference which gives graduate students who are about to finish their PhD project an opportunity to present their work. The theme of the conference was “Normativity in human cognition” and it attracted young researchers from all over Europe. Actually it was so successful that it will be worthwhile to turn it into a recurrent event.

#### ***Prospects for 2009***

An overview article that Robert van Rooij wrote in 2008 for the Vagueness Handbook can be read as a position paper marking the start of what in 2009 will develop into a large scale project on *Vagueness and Granularity*. A VENI grant for Raquel Fernandez, a grant in the LOGICCC programme of the European Science Foundation for Robert van Rooij, and a grant in the Free Competition of NWO’s division of Humanities for and Frank Veltman, made it possible research team in which two senior researchers, two post-docs and three PhD students participate. This investment of almost twenty (wo)men-years creates the opportunity to study many aspects of the topic. The goal is to arrive at an integrated theory, and one of the main questions is what form this theory should take. It is clear that one cannot follow the standard approach by first specifying a semantics and then turn to pragmatics. Semantics and pragmatics are to be developed side by side, and in some sense the primacy will have to be given to pragmatics. Vagueness is an excellent domain for studying the ways in which speakers coordinate their language to promote

mutual understanding.

Also, and on an even wider scale, ILLC's research in the field of cognitive science will gain some extra momentum. Throughout the University of Amsterdam research in cognitive science is flourishing. So much so that 'cognition' has been selected by the Board of Governors as a university wide focus point for research for the next four years. The Cognitive Science Centre Amsterdam (CSCA), in which ILLC participates, will give shape to this focus point. As things stand now the plan is to promote interdisciplinary projects that combine experimental or methodological approaches from the various disciplines represented in the CSCA. Several groups in LoLa will profit from this.

As already indicated above, research in the history of our trade is getting more and more important. This may appear also from the fact ILLC will host a symposium on "Logic and 17<sup>th</sup> Century Scientific Thought", organized under the auspices of the Wallis project at Oxford. Jaap Maat is the local organizer of this event, which will take place on April 23-24.

### *Prizes and Awards 2008*

Aloni, M.

- NWO VIDI award for the project: 'Indefinites and beyond. Evolutionary pragmatics and typological semantics'.

Dutilh-Novaes, C.

- Scots Centennial Visiting Fellowship at the School of Philosophy of the University of St. Andrews.

Fernández Rovira, R.

- Postdoctoral VENI grant (NWO).

Franke, M.

- Best paper prize ESSLLI 2008 Student Session.

Maier, E.

- NWO Rubicon award

Rietveld, D.W.

- NWO Rubicon award: post-doc research at Harvard University in the period 2008-2010.

Schulz, K.

- LOT-publieksprijs, for her dissertation: 'Minimal models in semantics and pragmatics Free choice, exhaustivity and conditionals.'

*Professional Distinctions, memberships of scientific boards, etc.*

Dekker, P.J.E.

- Chairman of the Standing Committee, European Summer School in Logic, Language and Information (ESSLLI).

Fernández Rovira, R.

- Board member and coordinator of the SemDial Board overseeing the organisation of the SemDial Workshop Series.
- Member of the Executive Board of the journal "Dialogue & Discourse".
- Member of the Expert Consulting Group of the ISO project 24617-2, "Semantic Annotation Framework (SemAF) Part 2: Dialogue acts".
- Member of the Program Committee for the "Discourse, Dialogue and Pragmatics" track of the Conference on Empirical Methods for Natural Language Processing (2008).

Groenendijk, J.A.G.

- Member of the NWO Humanities Selection Committee for the Innovational Research Incentives Scheme –Vidi

Stokhof, M.J.B..

- Chairman of *de Universitaire Onderzoekscommissie*, UvA.
- Chairman, *Alfa Beraad*.
- Chairman of the Humanities Council, NWO.
- Chairman of the Steering Committee of the 'Maatschappelijk Verantwoord Innoveren'-programme, NWO
- Chairman of the Quality Assurance Committee of the HERA Joint Research Projects.
- Member of the Standing Committee for the Humanities, European Science Foundation.
- Member of the Steering Committee and Network Board, ERA network HERA.

Veltman, F.J.J.M.

- Member of the *Commissie Wijsbegeerte*, of the National Fund for Scientific Research (Belgium).

*Editorial positions*

Aloni, M.

- Semantics and Pragmatics.

Dekker, P.J.E.

- Journal of Semantics.
- Linguistics and Philosophy.



Groenendijk, J.A.G.

- Semantics & Pragmatics.

Rooij, R.A.M. van

- Synthese.
- Journal of Semantics.
- Language section of the bookseries 'Logic and Games'.

Veltman, F.J.J.M.

- Semantics and Pragmatics.
- Journal of Philosophical Logic.

***Researchers and other personnel 2008***

POSITION	NAME	Funding				Total
		UvA	NWO	EU	None	
Full professor	Groenendijk	0.40				0.40
	van Lambalgen	0.20				0.20
	Stokhof	0.40				0.40
	Veltman	0.20				0.20
Associate professor	van Lambalgen	0.14				0.14
	Veltman	0.20				0.20
Assistant professor	Dekker	0.40				0.40
	Janssen	0.30				0.30
	Schulz	0.07				0.07
Postdoc	Aloni		0.80			0.80
	Arsenijevic		1.00			1.00
	Dutilh-Novaes		0.75			0.75
	Fernández					
	Rovira		0.26			0.26
	Maier		0.58			0.58
	van Rooij		1.00			1.00
	Schulz		0.70			0.70
	Weidman					
	Sassoon		0.04			0.04
PhD student	Achourioti		0.75			0.75
	Andrade-Lotero	1.00				1.00
	Balogh	0.53				0.53
	Bastiaanse		0.71			0.71
	Bax	0.67				0.67
	Franke		1.00			1.00
	de Jager		1.00			1.00
	Karawani	0.17				0.17

PhD student	Port		0.75			0.75
	Roelofsen	0.67				0.67
	Staudacher			1.00		1.00
	Szymanik			1.00		1.00
	Wilde	0.42				0.42
	Wolf			0.08		0.08
Guest PhD student	Bentzen				0.50	0.50
	Gakis				1.00	1.00
	Zagan				0.33	0.33
Guest researcher	Hansen				0.33	0.33
	Hara				0.17	0.17
	Landman				0.00	0.00
	Wang				0.88	0.88
	Total	5.75	9.43	2.00	3.21	20.39

# Chapter 3. Graduate Programme in Logic

In the year 2008, the global financial crisis started to affect the MSc Logic in ways somewhat unexpected. Over the past years, we always had a large number of students funded by various grants, for instance, the generous grants given to us by the E.W. Beth Foundation. With budget cuts and the fact that the E.W. Beth Foundation lost all of their money in the financial turmoil that hit the banking world, several funding options for our students disappeared, and those that remained seriously cut back on funding.

We reported last year that the student fee hike was seen as one of the major dangers for the MSc Logic. The fact that the MSc Logic is the best fully interdisciplinary Master's programme in logic means that we attract applicants from the best universities in the U.S.A.; applicants who simultaneously apply to the most prestigious PhD programmes in the U.S. And to our MSc Logic. The best of these applicants will receive a funding offer for five years from schools such as Princeton University, Stanford University or other similarly prestigious places. It is in the interest of the Universiteit van Amsterdam to make sure that we attract these students to our programme in order to corroborate Amsterdam's role as a leading world center for logic. Proper funding and possibilities of waiving the international tuition in cases like this would be necessary first steps.

Despite these continuing financial problems, research and teaching in the MSc Logic continued at the usual high level. In September 2008, a new class of students with 29 MSc Logic students and 6 Logic Year students was welcomed. The new class was similar to those of earlier years: 25.7% of the new students were Dutch (down from 26.9% in 2007), 31.4% were non-European (down from 33.3% in 2007): these percentages have been relatively stable over the past five years. As in the past years, our students were very successful in attracting grants for their studies. The final two Beth scholarships (before the E.W. Beth Foundation lost their money) were given to David Fiske (U.S.A.) and Yves Fomatati (Cameroon). 6 students won an HSP grant of Nuffic. These were: Kian Mintz-Woo (Canada), Evan DeCorte (Canada), Christian Geist (Germany), Alexandru Marcoci (Romania), H el ene Tourigny (Canada) and Jonathan Shaheen (USA).

The year 2008 saw 12 MSc Logic graduations of which seven started a PhD project; among them graduates who managed to get into the competitive PhD programmes at Stanford, the City University of New York, and the University of St. Andrews. Two of the graduates remained in Amsterdam: Pietro Galliani was hired in the LogICCC project LINT coordinated by Professor Jouko V a an anen and Sara Ramezani, one of our Iranian students, was hired in the research group 'Computational Intelligence and Multi-agent Games' at CWI.

The Graduate Programme in Logic started a new Erasmus exchange programme with Sofia University in Bulgaria. The first two exchange students enrolled in September 2008, one of which decided to stay in Amsterdam after a year (with due permission of our partners in Sofia). We expect further exchanges, including teacher exchanges between Sofia and Amsterdam.

# Chapter 4. Management

## 4.1 People, research input

Appendix 1 shows the total fte of the ILLC staff per faculty (table 1) and the total research fte per research programme (table 2). In comparison with 2007, there is an increase in the total fte of more than 10 fte and an increase in the research fte of more than 8 fte. It seems consistent with the division between education and research tasks for every position, that an increase in every total fte should render an increase of .8 in research fte. The question then remains where do these 10 fte's come from given that this is again an increase on top of the even larger one noted in last year's report. Most of this can be traced back to an increase in postdocs (+3), phd students (+2), lecturer (+1) and guest researchers (+2).

## 4.2 Publications, research output

The following is a selected overview of the publications produced by the people working at the ILLC:

1. Academic Publications	a. in refereed journals	56
	b. in other journals	6
	c. book chapters	17
	d. articles in proceedings	72
2. Monographs		3
3. Dissertations		9

## 4.3 Communication

ILLC communicates by means of the following media:

- our website <http://www.illc.uva.nl>
- ILLC News, our weekly news letter announcing upcoming local events, job openings, funding opportunities, new publications etc., sent to almost 300 internal and external subscribers.
- ILLC Conferences Mailing, a monthly news letter announcing national and international conferences, calls for proposals etc., sent to the same subscribers as ILLC News.
- ILLC Magazine; a yearly magazine, mainly for our MSc and PhD alumni but sent to the ILLC community and interested parties as well.
- The annual report.

#### 4.4 Events

Again, the ILLC has maintained its high average of organizing events. The several research groups of the ILLC organize a total of 8 regular seminars or colloquia. Most of them are held bi-weekly. A complete list can be found in Appendix 4.1.

In addition, the ILLC organized 16 international conferences and workshops. An overview can be found in Appendix 4.2. One of these events, namely the European Summer Schools in Logic, Language and Information (ESSLLI), deserves extra attention as it is one of the largest annual events in the research area of the ILLC.

#### 4.5 Finances

<i>Funding</i>	k€	%
Direct funding (UVA)	1,825	65%
Research grants (NWO)	456	16%
Contract research (EU)	517	18%
<b>Total funding</b>	<b>2,798</b>	<b>100%</b>
<i>Expenditure</i>		
Personnel Costs	2,247	83%
Other Costs	457	17%
<b>Total Expenditure</b>	<b>2,704</b>	<b>100%</b>
Financial result	94	

Please note that the table above only concerns the FNWI part of the ILLC where the ILLC is budget holder. At the FGW the ILLC is not a budget holder (researchers fall under several departments). Also note that the amount for Direct funding includes matching to cover overhead costs in NWO and EU projects. The reason for this is that the UvA works with the fullcost model, and that organizations like NWO only reimburse salary costs.

#### 4.6 Administration

Scientific director: Prof. Dr. F.J.M.M. Veltman  
Director Master of Logic programme: Dr. B. Löwe  
Manager (Bedrijfsvoerder): Ms Drs. I.M. van Loon  
Administrator Master of Logic program: Ms Drs. T. Kassenaar  
Secretary (ILLC Office): Drs. P. van Ormondt  
Secretary (ILLC Office): Ms K. Gigengack  
System administrator and web master: Dr. M. Vervoort

# Appendix 1. fte/research fte/funding

*Table 1. FTE per Faculty*

POSITION	FGW	FNWI	Total
Full professor	4.00	3.13	7.13
Emeritus		1.00	1.00
Associate professor	3.21	2.64	5.85
Assistant professor	2.67	4.68	7.35
Lecturer	0.67	0.79	1.46
Postdoc	7.17	3.96	11.13
PhD student	13.12	20.38	33.49
Guest PhD student	1.83	10.11	11.94
Guest researcher	0.17	4.86	5.03
	32.83	51.55	84.38

*Table 2. Research FTE per research programme*

POSITION	LACO	LOCO	LOLA	Total
Full professor	0.40	1.57	1.20	3.17
Associate professor	1.83	1.50	0.34	3.67
Assistant professor	2.45	1.75	0.77	4.97
Postdoc	3.50	2.10	5.13	10.73
PhD student	8.58	12.44	9.74	30.76
Guest PhD student	1.15	8.96	1.83	11.94
Guest researcher		3.65	1.38	5.03
Total	17.91	31.96	20.39	70.26

The standard figures for research FTE are different for the FGW and FNWI, and are as follows:

## **FGW**

Full professor/associated professor/assistant professor: research FTE = 0.4

PhD students/postdocs/guests: research FTE = 1.0

## **FNWI**

Full professor/associated professor/assistant professor: research FTE = 0.5

Postdocs: research FTE = 0.9

PhD students (UvA and NWO funded, 4 years): research FTE = 0.75

PhD students (EU funded, 3 years) research FTE = 1.0

Guest PhD students/guests: research FTE = 1.0

*Table 3. Funding (percentage of research fte)*

POSITION	UvA	NWO	EU	None
Full professor	84%	-	-	16%
Emeritus	-	-	-	100%
Associate professor	46%	54%	-	-
Assistant professor	38%	62%	-	-
Postdoc	7%	87%	6%	-
PhD student	19%	53%	28%	-
Guest PhD student	-	-	-	100%
Guest researcher	8%	-	-	92%
Grand Total	18%	43%	13%	25%

# Appendix 2. List of publications

## Appendix 2.1 Language and Computation

### *Articles in refereed journals*

Bar-Haim, R., Sima'an, K. & Winter, Y. (2008). Part-of-speech tagging of Modern Hebrew text. *Journal of Natural Language Engineering*, 14(2), 223-251.

Bod, R. (2008). Constructions at work or at rest? *Cognitive Linguistics*, 20(1), 129-134.

Bod, R. (2008). De unificatie van menselijke cognitie. *Algemeen Nederlands Tijdschrift voor Wijsbegeerte*, 100(2), 129-137.

Frank, S.L., Koppen, M., Noordman, L.G.M. & Vonk, W. (2008). World knowledge in computational models of discourse comprehension. *Discourse processes*, 45(6), 429-463.

Hassan, H., Sima'an, K. & Way, A. (2008). Syntactically lexicalized phrase-based SMT. *IEEE Transactions on Audio, Speech and Language Processing*, 16(7), 1260-1273.

Honing, H. & Haas, W.B. de (2008). Swing once more: Relating timing and tempo in expert jazz drumming. *Music Perception*, 25(5), 471-476.

Honing, H. & Ladinig, O. (2008). The potential of the Internet for music perception research: A comment on lab-based versus Web-based studies. *Empirical Musicology Review*, 3(1), 4-7.

Honing, H. & Reips, U.-D. (2008). Web-based versus lab-based studies: A response to Kendall (2008). *Empirical Musicology Review*, 3(2), 73-77.

Kamps, J., Geva, S. & Trotman, A. (2008). Report on the SIGIR 2008 Workshop on Focused Retrieval. *SIGIR Forum*, 42(2), 59-65.

Kontinen, J. & Szymanik, J. (2008). A remark on collective quantification. *Journal of Logic, Language and Information*, 17(2), 131-140.

Smith, L.M. & Honing, H. (2008). Time-frequency representation of musical rhythm by continuous wavelets. *Journal of Mathematics and Music*, 2(2), 81-97.

Zeevat, H. (2008). Optimal interpretation as an alternative to Gricean pragmatics. *Oslo Studies in Language*, 1(1), 191-216.

Zuidema, W.H. & Boer, B. de (2008). The evolution of combinatorial phonology. *Journal of Phonetics*.



### *Papers in proceedings*

Arampatzis, A. & Kamps, J. (2008). A study of query length. In S.-H. Myaeng, D.W. Oard, F. Sebastiani, T.-S. Chua & M.-K. Leong (Eds.), *ACM SIGIR 2008: Thirty-first Annual International ACM SIGIR Conference on Research and Development in Information Retrieval, July 20-24, 2008, Singapore: Proceedings* (pp. 811-812). New York, NY: Association for Computing Machinery (ACM).

Arampatzis, A., Nussbaum, N. & Kamps, J. (2008). Where to stop reading a ranked list? In *The seventeenth Text REtrieval Conference (TREC 2008) notebook* (pp. 1-7). National Institute of Standards and Technology (NIST).

Bod, R., Borensztajn, G., Freudenthal, D., Pine, J., Gobet, F., Hudson Kam, C.L., Clark, A. & Sakas, W.G. (2008). Rules and exemplars in language acquisition. In B.C. Love, K. McRae & V.M. Sloutsky (Eds.), *Proceedings of the 30th Annual Conference of the Cognitive Science Society* (pp. 911-912). Austin, TX: Cognitive Science Society.

Bod, R., Maat, J., Beeley, P., Miert, D. van & Cram, D. (2008). Erudition and Empiricism: The Intertwining of the Humanities and the Sciences in Early Modern Europe. In *Proceedings Three Societies 2008, Oxford, 4-6 July, 2008 (Sixth Joint Meeting of the BSHS, CSHPS, and HSS)* (pp. 80-83).

Borensztajn, G., Zuidema, W. & Bod, R. (2008). Children's grammars grow more abstract with age - Evidence from an automatic procedure for identifying the productive units of language. In B.C. Love, K. McRae & V.M. Sloutsky (Eds.), *Proceedings of the 30th Annual Conference of the Cognitive Science Society* (pp. 47-52). Austin, TX: Cognitive Science Society.

Fachry, K.N., Kamps, J. & Zhang, J. (2008). Access to archival material in context. In P. Borland, J.W. Schneider, M. Lalmas, A. Tombros, J. Feather, D. Kelly & A.P. de Vries (Eds.), *Proceedings of the second International Symposium on Information Interaction in Context: October 14-17, 2008, London, United Kingdom Vol. 348. ACM International Conference Proceeding Series* (pp. 102-109). New York, NY: Association for Computing Machinery (ACM).

Fachry, K.N., Kamps, J., Koolen, M. & Zhang, J. (2008). Using and detecting links in Wikipedia. In N. Fuhr, J. Kamps, M. Lalmas & A. Trotman (Eds.), *Focused access to XML documents: 6th International Workshop of the Initiative for the Evaluation of XML Retrieval, INEX 2007, Dagstuhl Castle, Germany, December 17-19, 2007: Revised and selected papers Vol. 4862. Lecture Notes in Computer Science* (pp. 388-403). Berlin: Springer.

Fachry, K.N., Kamps, J., Kaptein, R., Koolen, M. & Zhang, J. (2008). The University of Amsterdam at INEX 2008: Ad Hoc, Book, Entity Ranking, Interactive,

Link the Wiki, and XML Mining Tracks. In S. Geva, J. Kamps & A. Trotman (Eds.), *INEX 2008 workshop pre-proceedings* (pp. 66-91).

Frank, S.L. & Čerňanský, M. (2008). Generalization and systematicity in echo state networks. In B.C. Love, K. McRae & V.M. Sloutsky (Eds.), *Proceedings of the 30th Annual Conference of the Cognitive Science Society* (pp. 733-738). Austin, TX: Cognitive Science Society.

Frank, S.L. (2008). Self-organizing word representations for fast sentence processing. In R.M. French & E. Thomas (Eds.), *From associations to rules: Connectionist models of behavior and cognition: Proceedings of the Tenth Neural Computation and Psychology Workshop, Dijon, France, 12-14 April, 2007* (pp. 78-88). Singapore: World Scientific.

Fuhr, N., Kamps, J., Lalmas, M., Malik, S. & Trotman, A. (2008). Overview of the INEX 2007 Ad Hoc Track. In N. Fuhr, J. Kamps, M. Lalmas & A. Trotman (Eds.), *Focused access to XML documents: 6th International Workshop of the Initiative for the Evaluation of XML Retrieval, INEX 2007, Dagstuhl Castle, Germany, December 17-19, 2007: Revised and selected papers Vol. 4862. Lecture Notes in Computer Science* (pp. 1-23). Berlin: Springer.

Hassan, H., Sima'an, K. & Way, A. (2008). A syntactic language model based on incremental CCG parsing. In *SLT 2008: 2008 IEEE Workshop on Spoken Language Technology: Proceedings* (pp. 205-208). IEEE.

Hiemstra, D., Kamps, J., Kaptein, R. & Li, R. (2008). Parsimonious language models for a terabyte of text. In E.M. Voorhees & L.P. Buckland (Eds.), *The sixteenth Text REtrieval Conference (TREC 2007) proceedings* (pp. 1-7). National Institute of Standards and Technology (NIST).

Honing, H. (2008). De analfabetische luisteraar. In R. Diekstra & M. Hogenes (Eds.), *Harmonie in gedrag: De maatschappelijke en pedagogische betekenis van muziek* (pp. 29-35). Uithoorn: Karakter.

Honing, H.J. (2008). Musical competence and the role of exposure. In *Proceedings of the Music and Language II Conference* (pp. 102-102). Boston: Tufts University.

Honing, H.J., Ladinig, O., Winkler, I. & Haden, G. (2008). Probing emergent meter perception in adults and newborns using event-related brain potentials: a pilot study. In *Proceedings of the Neurosciences & Music III Conference* (pp. 223-223). Montreal: McGill University.

Kamps, J., Pehcevski, J., Kazai, G., Lalmas, M. & Robertson, S. (2008). INEX 2007 evaluation measures. In N. Fuhr, M. Lalmas, A. Trotman & J. Kamps (Eds.), *Focused access to XML documents Vol. 4862. Lecture Notes in Computer Science* (pp.

24-33). Heidelberg: Springer.

Kamps, J., Koolen, M. & Lalmas, M. (2008). Locating relevant text within XML documents. In S.-H. Myaeng, D.W. Oard, F. Sebastiani, T.-S. Chua & M.-K. Leong (Eds.), *ACM SIGIR 2008: Thirty-first Annual International ACM SIGIR Conference on Research and Development in Information Retrieval, July 20-24, 2008, Singapore: Proceedings* (pp. 847-848). New York, NY: Association for Computing Machinery (ACM).

Kamps, J. & Koolen, M. (2008). The importance of link evidence in Wikipedia. In C. Macdonald, I. Ounis, V. Plachouras, I. Ruthven & R.W. White (Eds.), *Advances in information retrieval: 30th European Conference on IR Research, ECIR 2008, Glasgow, UK, March 30-April 3, 2008: Proceedings Vol. 4956. Lecture Notes in Computer Science* (pp. 270-282). Berlin: Springer.

Kamps, J., Geva, S., Trotman, A., Woodley, A. & Koolen, M. (2008). Overview of the INEX 2008 Ad Hoc Track. In S. Geva, J. Kamps & A. Trotman (Eds.), *INEX 2008 workshop pre-proceedings* (pp. 1-28).

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LI, R., Kaptein, R., Hiemstra, D. & Kamps, J. (2008). Exploring topic-based language models for effective web information retrieval. In *Proceedings of the 8th Dutch-Belgian Information Retrieval Workshop (DIR 2008)* (pp. 65-71). Maastricht: University of Maastricht.

Mylonakis, M. & Sima'an, K. (2008). Phrase translation probabilities with ITG priors and smoothing as learning objective. In *EMNLP 2008: 2008 Conference on Empirical Methods in Natural Language Processing: Proceedings of the conference* (pp. 630-639). Stroudsburg, PA: Association for Computational Linguistics (ACL).

Plank, B. & Sima'an, K. (2008). Parsing with subdomain instance weighting from raw corpora. In *Proceedings of Interspeech 2008*. International Speech Communication Association (ISCA).

Plank, B. & Sima'an, K. (2008). Subdomain sensitive statistical parsing using raw corpora. In *LREC 2008: Sixth International Conference on Language Resources and Evaluation: Proceedings* (pp. 465-469). European Language Resources Association (ELRA).

Sangati, F. & Zuidema, W.H. (2008). Communication, Cooperation, and Coherence. In A.D.M. Smith, K. Smith & R. Ferrer i Cancho (Eds.), *The Evolution of Language Vol. 7. Proceedings of the International Conference on the Evolution of Language* (pp. 491-492). World Scientific.

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Zeevat, H. (2008). Constructive optimality theoretic syntax. In J. Villadsen & H. Christiansen (Eds.), *Proceedings of the 5th International Workshop on Constraints and Language Processing (CSLP 2008)* (pp. 76-88). Roskilde: Roskilde University, Computer Science.

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Zhang, J., Fachry, K.N. & Kamps, J. (2008). Automatic link-detection in Encoded Archival Descriptions. In L.L. Opas-Hänninen, M. Jokelainen, I. Juuso & T. Seppänen (Eds.), *Digital humanities 2008: The 20th Joint International Conference of the Association for Literary and Linguistic Computing, and the Association for Computers and the Humanities and the 1st Joint International Conference of the Association for Literary and Linguistic Computing, the Association for Computers and the Humanities and the Society for Digital Humanities - Société pour l'étude des médias interactifs, University of Oulu, Finland, 24-29 June, 2008: Conference abstracts* (pp. 226-228). Oulo: University of Oulu, English Philology.

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Zuidema, W. (2008). A gradual path to hierarchical phrase-structure: Insights from modeling and corpus-data. In A.D.M. Smith, K. Smith & R. Ferrer i Cancho (Eds.), *The evolution of language: Proceedings of the 7th International Conference (EVOLANG7), Barcelona, Spain, 12-15 March 2008* (pp. 509-510). Hackensack, NJ: World Scientific.

Zuidema, W.H. (2008). Empirical evidence for recursive hierarchical structure in child language. In W. Sakas (Ed.), *Proceedings Workshop on Psycho-Computational Models of Language Acquisition*.

### ***Book chapters***

Bod, R. (2008). The data-oriented parsing approach: Theory and application. In J. Fulcher & L.C. Jain (Eds.), *Computational intelligence: A compendium* (Studies in computational intelligence, 115) (pp. 307-348). Berlin: Springer.

Zeevat, H. (2008). Where is pragmatics in optimality theory? In I. Kecskes & J. Mey (Eds.), *Intention, common ground and the egocentric speaker-hearer* (Mouton series in pragmatics, 4) (pp. 87-104). Berlin: Mouton de Gruyter.

### ***Monographs***

Trotman, A., Geva, S. & Kamps, J. (2008). *Proceedings of the SIGIR 2007 Workshop on Focused Retrieval*. Dunedin New Zealand: University of Otago.

### ***Edited Volumes***

Trotman, A., Geva, S. & Kamps, J. (Eds.). (2008). *Proceedings of the SIGIR 2008 Workshop on Focused Retrieval: Held in Singapore, 24 July 2008*. Dunedin: University of Otago, Department of Computer Science.

## Appendix 2.2 Logic and Computation

### *Articles in refereed journals*

Adriaans, P. & Vitányi, P.M.B. (2009). Approximation of the two-part MDL code. *IEEE Transactions on Information Theory*, 55(1), 444-457.

Apt, K.R., Rossi, F. & Venable, K.B. (2008). Comparing the notions of optimality in CP-nets, strategic games and soft constraints. *Annals of mathematics and artificial intelligence*, 52(1), 25-54.

Balbiani, P., Baltag, A., Ditmarsch, H. van, Herzig, A., Hoshi, T. & Lima, T. de (2008). 'Knowable' as 'known after an announcement'. *Review of Symbolic Logic*, 1(3), 305-334.

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## Appendix 2.4 ILLC Prepublications

PP-2008-01

Johan van Benthem *An Interview on the Philosophy of Information.*

PP-2008-02

Johan van Benthem *Games that Make Sense: logic, language, and interaction.*

PP-2008-03

Johan van Benthem *In Praise of Strategies.*

PP-2008-04

Johan van Benthem, Maricarmen Martinez *The Stories of Logic and Information.*

PP-2008-05

Johan van Benthem *A Brief History of Natural Logic.*

PP-2008-06

Johan van Benthem *Logic, Rational Agency, and Intelligent Interaction.*

PP-2008-07

Johan van Benthem *The Many Faces of Interpolation.*

PP-2008-08

Johan van Benthem *'Tell It Like It Is': information flow in logic.*

PP-2008-09

Johan van Benthem *Information Update as Social Choice.*

PP-2008-10

Wouter Koolen *Temporary Unavailability Logic and General Modification Logic.*

PP-2008-11

Guram Bezhanishvili, Nick Bezhanishvili, Dick de Jongh *The Kuznetsov-Gerciu and Rieger-Nishimura Logics: The Boundaries of the Finite Model Property.*

PP-2008-12

Joel Uckelman, Ulle Endriss *Winner Determination in Combinatorial Auctions with Logic-based Bidding Languages.*

PP-2008-13

Brammert Ottens, Ulle Endriss *Comparing Winner Determination Algorithms for Mixed Multi-unit Combinatorial Auctions.*

PP-2008-14

Yann Chevaleyre, Ulle Endriss, Nicolas Maudet *Trajectories of Goods in Distributed Allocation.*

PP-2008-15

Hylke Buisman, Gijs Kruitbosch, Nadya Peek, Ulle Endriss *Simulation of Negotiation Policies in Distributed Multiagent Resource Allocation.*

PP-2008-16

Johan van Benthem *For Better or for Worse: Dynamic Logics of Preference.*

PP-2008-17

Johan van Benthem, Cedric Dégrement *Building bridges between dynamic and temporal doxastic logics.*

PP-2008-18

Luca Motto Ros, Brian Semmes *A New Proof of the Jayne-Rogers Theorem.*

PP-2008-19

Johan van Benthem, Daisuke Ikegami *Modal Fixed-Point Logic and Changing Models.*

PP-2008-20

Peter Øhrstrøm, Henrik Schärfe, Sara L. Uckelman *Jacob Lorhard's ontology: a 17th century hypertext on the reality and temporality of the world of intelligibles.*

PP-2008-21

Rens Bod *Getting Rid of Derivational Redundancy or How to Solve Kuhn's Problem.*

PP-2008-22

Rens Bod *Is the End of Supervised Parsing in Sight?.*

PP-2008-23

Rens Bod *From Exemplar to Grammar: Integrating Analogy and Probability in Language Learning.*

PP-2008-24

Rens Bod *The Data-Oriented Parsing Approach: Theory and Application.*

PP-2008-25

Tikitu de Jager, Benedikt Löwe *Nonmonotone game labellings.*

PP-2008-26

Jeroen Groenendijk *Inquisitive Semantics: Two Possibilities for Disjunction.*

PP-2008-27

Samson Abramsky, Jouko Väänänen *From IF to BI, A Tale of Dependence and Separation.*

PP-2008-28

Joel Uckelman, Ulle Endriss *Preference Modeling by Weighted Goals with Max Aggregation.*

PP-2008-29

Sara Uckelman *Three 13th-century views of quantified modal logic.*

PP-2008-30

Johan van Benthem, Denis Bonnay *Modal Logic and Invariance.*

PP-2008-31

Benedikt Löwe, Eric Pacuit, Sanchit Saraf *Analyzing stories as games with mistaken and changing beliefs.*

PP-2008-32

Marta Bilkova, Dick de Jongh, Joost J. Joosten *Interpretability in PRA.*

PP-2008-33

Johan van Benthem *Logical Pluralism Meets Logical Dynamics?.*

PP-2008-34

Johan van Benthem, Cédric Dégrémont *Multi-agent Belief Dynamics: Bridges between Dynamic Doxastic and Doxastic Temporal Logics.*

PP-2008-35

Johan van Benthem, Jelle Gerbrandy, Tomohiro Hoshi, Eric Pacuit *Merging Frameworks for Interaction.*

PP-2008-36

Johan van Benthem *Merging Observation and Access in Dynamic Logic.*

PP-2008-37

Johan van Benthem *The Information in Intuitionistic Logic.*

PP-2008-38

Floris Roelofsen, Maria Aloni *Perspectives on Concealed Questions.*

PP-2008-39

Cédric Dégrémont, Lena Kurzen *Modal Logics for Reasoning about Preferences and Cooperation: Expressive Power and Complexity.*

PP-2008-40

Lena Kurzen *A Logic for Cooperation, Actions and Preferences.*

PP-2008-41

Joost J. Joosten, Grant Olney Passmore *Does SAT exhibit fractal behavior?.*

PP-2008-42

Paul Dekker *A Guide to Dynamic Semantics*.

PP-2008-43

Jakub Szymanik *The Computational Complexity of Quantified Reciprocals*.

PP-2008-44

Amélie Gheerbrant, Balder ten Cate *Complete Axiomatizations of MSO, FO( $TC^1$ ), FO( $LFP^1$ ) on Finite Trees*.

PP-2008-45

Sujata Ghosh, Fernando R. Velázquez-Quesada *Expressing Belief Flow in Assertion Networks*.

PP-2008-46

Nina Gierasimczuk *Identification through Inductive Verification. Application to Monotone Quantifiers*.

PP-2008-47

Michael Franke, Tikitou de Jager *Now that you mention it: Awareness dynamics in discourse and decisions*.

PP-2008-48

Fernando R. Velázquez-Quesada *Inference and Update*.

PP-2008-49

Jakub Szymanik, Marcin Zajenkowski *Comprehension of Simple Quantifiers. Empirical Evaluation of a Computational Model*.

PP-2008-50

Sara L. Uckelman, Jaap Maat, Katherina Rybalko *The art of doubting in Obligations Parisienses*.

PP-2008-51

Sara L. Uckelman *Logic and the condemnations of 1277*.

PP-2008-52

Sujata Ghosh, Benedikt Löwe, Sanchit Saraf *Pointer Semantics with Forward Propagation*.

PP-2008-53

Vanessa Ferdinand, Willem Zuidema *An experiment in iterated function learning*.

PP-2008-54

Vanessa Ferdinand, Willem Zuidema *Language adapting to the brain: a study of a Bayesian iterated learning model*.



PP-2008-55

Pietro Galliani *Probabilistic Dependence Logic*.

PP-2008-56

Willem Zuidema, Bart de Boer *Evolutionary Explanations for Natural Language -  
Criteria from Evolutionary Biology*.

# Appendix 3. Projects

## Appendix 3.1 Projects awarded in 2008

### *PhD project awarded to ILLC-ACLC*

In the framework of 'Dynamisering van het onderzoek' the FGW awarded a project (1 PhD student) to a joint venture of Kees Hengeveld, Hedde Zeijlstra (both ACLC), Maria Aloni, Jeroen Groenendijk and Frank Veltman. The title is: 'Crosslinguistic semantics'

### *Rubicon grant to Erik Rietveld*

Erik Rietveld, former PhD student of ILLC, was awarded an NWO Rubicon-grant for a two year stay as a fellow in Philosophy at Harvard University. The title of his research project is 'Unreflective Action'.

### *VENI award for Davide Grossi*

We are very happy that this year again we will have a VENI award winner at ILLC. Davide Grossi, now in Luxembourg, has chosen the ILLC to carry out his research on "Norm Implementation via Mechanisms". He will start January 1, 2009.

### *Four projects in the Eurocores program LogICCC*

Nine projects were selected in the first round of this program, and ILLC is a partner in four of these. Each has a budget of 200,000 EURO and will bring ILLC a PhD student or postdoc.

#### 1. Title: Logic for Interaction (LINT)

Principal investigators ILLC: Johan van Benthem, Jouko Väänänen

Partners: Universiteit van Amsterdam, The Netherlands

Göteborgs Universitet, Sweden (coordinator)

Technische Hochschule Aachen, Germany

University of Tampere, Finland

#### 2. Title: Computational Foundations of Social Choice (CSFC)

Principal investigator ILLC: Ulle Endriss

Partners: Universiteit van Amsterdam, The Netherlands

Heinrich-Heine-Universität Düsseldorf, Germany

Bilgi University, Istanbul, Turkey

The Hebrew University Jerusalem, Israel

Ludwig Maximilian Universität München, Germany (coordinator)

#### 3. Title: The Dialogical Foundations of Semantics (DiFoS)

Principal Investigator ILLC: Benedikt Löwe

Partners: Universiteit van Amsterdam, The Netherlands

Universidade de Coimbra, Portugal

Eberhard-Karls-Universität Tübingen, Germany (coordinator)

4. Title: Vagueness, Approximation and Granularity (VAAG)  
Principal investigators ILLC: Robert van Rooij and Frank Veltman  
Partners: Universiteit van Amsterdam, The Netherlands  
Humboldt Universität, Berlin, Germany (coordinator)  
Lunds Universitet, Sweden  
University of Zagreb, Croatia

### Appendix 3.2 Awards in 2008

#### ***Barbara Plank wins the IBM & KRDB Best Thesis Award 2008***

Barbara Plank (thesis main supervisor: Khalil Sima'an) wins the IBM & KRDB Best Thesis Award 2008 for the best thesis on "Language and Communication Technologies" for the MSc thesis carried out within the European Masters Program in LCT jointly supervised at the UvA and the Free University of Bozen-Bolzano and entitled "Sub-domain driven parsing".

#### ***Gideon Borensztajn awarded CogSci2008 prize***

Gideon Borensztajn is a graduate of the master Cognitive science and PhD student at ILLC. He has won the prestigious international CogSci prize for the best paper on Applied Cognitive Modeling.

Together with co-authors Jelle Zuidema and Rens Bod Borensztajn wrote the paper: "Children's grammars grow more abstract with age - Evidence from an automatic procedure for identifying the productive units of language". The prize will be handed out in July 2008 during the Cognitive Science Conference 2008 in Washington D.C. It is a very competitive prize and from 1000 submissions only 4 papers were selected for an award.

#### ***Nina Gierasimczuk wins Polish Award for Young Researchers***

Nina Gierasimczuk, PhD student at ILLC, has won the "Foundation for Polish Science Award for Young Researchers START 2008". This stipend is awarded "to the most promising young researchers (up to the age of 30) whose achievements have been already recognised."

#### ***Elsevier Foundation Award for "Computability in Europe" conference series***

The Elsevier Foundation announced that they are funding a programme called "Increasing representation of female researchers in the computability community". The CiE conference series, coordinated by Benedikt Löwe, receives an Elsevier grant in order to play an important role in giving female researchers the opportunity to present results and serve as plenary speakers and role models. CiE-CS will use the grant to establish mentoring and childcare programs at the conference.

#### ***The Music Cognition Group nominated for 'The Academic Year Award'.***

The Music Cognition Group has been nominated for the second and final round of the Academische Jaarprijs [Academic Year Award], an initiative of the Dutch newspaper NRC Handelsblad and two scientific organizations (NWO and KNAW) to promote the

popularization of science. The UvA-team will participate with the project proposal 'Zonder luisteraar geen muziek' ['No Music without a listener'].

# Appendix 4. Events

## Appendix 4.1 Regular Events

### *The DiP (Discourse Processing) Colloquium*

The Discourse Colloquium (DIP) is held every two weeks at the University of Amsterdam, Departments of Philosophy and Linguistics. The colloquium aims to bring together researchers and students who are interested in discourse analysis and to encourage discussion, collaboration and cross-fertilization of ideas. The main topic is the interpretation of utterances in their (textual) context. The orientation of the colloquium is quite broad: the talks may focus on semantics, pragmatics, prosody, or even syntax.

Speakers in 2008 included:

- Chung-Chieh Shan (Rutgers/Aarhus): *Theory of mind and bounded rationality without interpretive overhead*
- Emmanuel Chemla (ENS Paris): *From free choice inferences to presuppositions*
- Henk Verkuyl (UiL-OTS, Utrecht): *Binary Tense. Why binary?*
- Friday Oct. 17 Double feature: Guy Politzer (Institut Nicod)
- Keith Stenning (Edinburgh): *Causal cognition--some philosophical preliminaries*
- Anastasia Giannakidou (Chicago): *Polarity phenomena in natural language: Variation, scalarity, and dependent reference*
- Stephan van der Waart van Gulik (Ghent): *Semantic transformers and their implementation in fuzzy logic*
- Maria Bittner (Rutgers, NJ): *Grammatical centering: Tense, mood, and evidentiality*
- Nathan Klinedinst (UCL London): *Presupposition projection -- again*
- Paula Menéndez-Benito (UMass. Amherst): *Modal Indefinites*
- Stelios Virvidakis (University of Athens): *Varieties of Quietism*
- Andrea Gualmini (UIL Utrecht): *Scope Ambiguities in Child Language: Resolution and Dissolution*
- Hans-Martin Gärtner (ZAS Berlin): *Low risk quantifiers*
- Arjen Zondervan (UIL Utrecht): *Experiments on the role of the Question Under Discussion for ambiguity resolution and implicature computation in adults*
- Nausicaa Pouscoulous (MPI Leipzig): *Pragmatic Inferences in Young Children*
- Raj Singh (MIT): *Economy and Intermediate Accommodation*
- Bart Geurts (University of Nijmegen): *Piggyback pronouns*
- Wang Lu (Tsing-Hua University, Beijing): *Wittgenstein's 'Way of Thinking'*
- Øystein Nilsen & Jakub Dotlačil (Utrecht Institute of Linguistics): *Reciprocals, the strongest meaning hypothesis, and the excluded middle*
- Veneeta Dayal (Rutgers): *Supplemental and Numeral Any*

### ***The Logic Tea***

The Logic Tea, a series of one-hour talks designed for students of mathematics, computer science, artificial intelligence, and philosophy, and the students of the Master of Logic program of the ILLC, with discussion, tea and cookies afterwards.

Speakers in 2008 included:

- Gideon Borensztajn (ILLC): *Do children's grammars grow more abstract with age?*
- Rosja Mastop (Utrecht): *Doing away with the force-content distinction*
- Edgar Andrade (ILLC): *On some formalisations of Aristotelian Logic*
- Catarina Dutilh Novaes (ILLC): *Controversies on the notion of Formal/Logical consequence*
- Michael Morreau (University of Maryland): *Comparative Similarity*
- Sebastian Sequoiah-Grayson: *A Procedural Interpretation of Split Negation*
- Walter Carnielli (State University of Campinas, Brazil): *Sewing Logics Together: the possible-translations semantics and new meanings for old logics*
- Martin Bentzen (ILLC): *Judging Free Agents - Towards a Formal Theory of Responsibility*
- Corina Strössner (Universitaet des Saarlandes): *The Meaning of Being Normal*
- Jakub Szymanik (ILLC): *Automata, Quantifiers and Natural Language Comprehension*

### ***The Colloquium on Mathematical Logic***

Starting in the Academic Year 2003/2004, the ILLC and the Mathematics and Philosophy Departments of the Universiteit Utrecht will be jointly organizing a Colloquium on Mathematical Logic (organizers: Jouko Väänänen, Jaap van Oosten and Rosalie Iemhoff). This joint colloquium revives the tradition of the InterCity seminar of the 1970s and 1980s and will be a venue for talks by external guests, researchers from Amsterdam and Utrecht, and last but definitely not least, students from Amsterdam and Utrecht.

Speakers in 2008 included:

- Sonja Smets (Brussels): *An Abstract Dynamic-Logical Setting for Quantum Mechanics*
- Ali Enayat: *Nonstandard Omega-standard Models of Finite Set Theory*
- Samson Abramsky (Oxford): *Full Completeness*
- Dag Westerstahl (University of Göttenborg): *Quantifiers, freezing, possessives, and compositionality*
- Michael Rathjen (University of Leeds): *"Models" for intuitionistic set theories*
- Michiel van Lambalgen (ILLC): *Lawlessness, randomness and the axiom of choice*
- Patrick Dehornoy (Université de Caen): *Recent progress on the Continuum Hypothesis, after H. Woodin*
- Mirna Dzamonja (Univeristy of Norwich): *Combinatorics of trees*

- Sakaé Fuchino (Chubu university, Japan): *Axiomatization of generic extensions by homogeneous partial orderings*
- Kohei Kishida (University of Pittsburgh): *Topological Completeness of First-Order Modal Logic*
- Bart Kastermans (University of Wisconsin): *Stability and Posets*

### ***GLoRiClass Seminar***

The GLoRiClass Seminar is the weekly meeting for the Marie Curie Research Training Site GLoRiClass. It is organized for and by the GLoRiClass fellows with talks by ILLC staff members, students and game-related guests.

Speakers in 2008 included:

- Martin Magnusson (Linköping): *Logical Agents for Language and Action - Creating Smarter Computer Game Characters*
- Mikaël Cozic (Paris): *Probabilistic Unawareness*
- Leon van der Torre (Luxembourg): *A normative framework for norm change*
- Pelle Guldberg Hansen (Roskilde): *Learning and the problem of the emergence of convention: do stationarity assumptions imply a vicious circularity or a key to salvation?*
- Xavier Caicedo (Bogota): *Quantifier laws of imperfect information logic*
- Wiebe van der Hoek (Liverpool): *Cooperative Boolean Games*
- Bernhard von Stengel (LSE, London): *Hard-to-Solve Bimatrix Games*
- Andrés Perea (Maastricht): *An algorithm for proper rationalizability*
- Dov Samet (Tel Aviv): *Epistemic Game Theory*
- Theo Offerman (University of Amsterdam): *Noisy Signaling: Theory and Experiment*
- Werner Raub (Utrecht University): *Trust in social and economic exchange: game-theoretic models and empirical evidence*
- Gerhard Jäger (Bielefeld): *Semantic rationalizability*
- Jérôme Lang (Toulouse): *From belief change to preference change*

### ***Computational Linguistics Seminar***

Talks by locals and outsiders, alternating with a reading group, on Computational Linguistics -- that is, research that is or can be implemented in a computer program, and tries to process or account for natural language data (which includes language modeling, statistical modeling, pattern recognition and machine learning methods, formal linguistic grammars, speech recognition, machine translation, computational semantics, and other topics that one currently finds at ACL, COLING, or in the CL journal).

Speakers in 2008 included:

- Gideon Borensztajn (ILLC): *The Hierarchical Prediction Network, or is the end of symbolic parsing in sight?*
- Vanessa Ferdinand (UvA): *How learning biases and cultural transmission*

- structure information: iterated learning in human subjects and bayesian agents*
- Federico Sangati (ILLC): *Unsupervised Methods for Head Assignments*
  - Floris Roelofsen (ILLC): *Anaphora Resolved*. A unified theory of pronouns, NP anaphora, and VP ellipsis.
  - Menno van Zaanen (Tilburg University): *Generic, Symbolic Sequence Classification*
  - Tejaswini Deoskar (Cornell University): *Unsupervised re-estimation of probabilistic lexicons for treebank PCFGs*
  - Cristina Barés Gómez (Institute of Islamic and Near East Studies, Spanish National Research Council, Zaragoza; and Philosophy, Logic, and Philosophy of Sciences Department, University of Sevilla, Spain): *Meaning in the automatic interpretation process of ancient Northwest Semitic texts*
  - Michael Klein (Radboud University Nijmegen): *Computational Modelling of Meaning Processing in the Brain*
  - Joakim Nivre (Växjö University and Uppsala University, Sweden): *Inductive Dependency Parsing of Natural Language Text*
  - Jacqueline van Kampen (Uil OTS, Utrecht University): *(Modeling) the steps of early syntax acquisition*

### ***Computational Social Choice Seminar***

The Computational Social Choice Seminar is a series of occasional talks that address issues at the interface of computer science (including logic, multiagent systems and artificial intelligence) and mathematical economics (including social choice theory, game theory and decision theory).

Speakers in 2008 included:

- Sara Ramezani (ILLC): Nash Social Welfare in Multiagent Resource Allocation
- Mathijs de Weerd (Delft): A Strategy-Proof Auction Mechanism without Money
- Krzysztof Apt (CWI & ILLC): A Distributed Platform for Mechanism Design
- Nadya Peek (UvA): Automatic Analysis of Voting Procedures
- Hervé Moulin (Rice): Sharing the Cost of a Capacity Network
- Nicolas Maudet (Paris): Communication Complexity of Distributed Resource Allocation Processes
- Marco Dall'Aglio (Pescara): A Model of Cooperation in Fair Division
- Jérôme Lang (Toulouse): Sequential Voting in Multi-issue Domains

### ***Logic, Language, and Reasoning Seminar***

This seminar aims at unifying the Netherlands-based researchers interested in language processing and human reasoning. It takes place more or less bi-monthly in the Netherlands.



Speakers in 2008 included:

- Iris van Rooij (Radboud University Nijmegen): *What makes a problem hard (or easy)? A computational perspective.*
- Nina Gierasimczuk & Jakub Szymanik (University of Amsterdam):  
Experimenting with some non-Fregean quantifier combinations
- Johan van Benthem (Amsterdam & Stanford): Logic and Psychology: Do the Facts Matter?

### ***Algebra/Coalgebra Seminar***

Speakers in 2008 included:

- Alessandra Palmigiano (ILLC): *Topological groupoid quantales and their representation theorems*
- Bas Spitters (Radboud Universiteit, Nijmegen): *Modal logics for probability and possibility via pointfree topology*
- Tomoyuki Suzuki (University of Leicester): *Canonicity of Substructural logics*
- Clemens Kupke (CWI): *Complete sets of co-operations*
- Guram Bezhanishvili (New Mexico State University): *Priestley order-compactifications and a generalization of Dwinger's theorem*
- Alexander Kurz (University of Leicester): *Functors on Varieties as Modal Logics*
- Mehrnoosh Sadrzadeh (University of Oxford): *Modal algebras go Dutch*

## **Appendix 4.2 Workshops and Conferences**

### **ILLC Open House**

Date: Friday 19 December 2008

Location: Felix Meritis, Keizersgracht 324, Amsterdam

Website: <http://www.illc.uva.nl/NewsandEvents/OpenHouse>

### **LINT Workshop - Logic for Interaction**

Date: 4-6 December 2008

Location: ILLC, Amsterdam

Website: <http://www.illc.uva.nl/lint/workshop2008.php>

### **7th International Conference on Logic and Cognition (ICLC-2008)**

Date: 10-13 November 2008

Location: Guangzhou, China

Website: <http://logic.sysu.edu.cn/logic/iclc2008/>

### **The Making of the Humanities**

Date: 23-25 October 2008

Location: De Doelenzaal, University of Amsterdam

<http://www.illc.uva.nl/MakingHumanities/registration.html>

**PALMYR-VII**

Date: 6-7 October, 2008

Location: Paris

Website: <http://www.illc.uva.nl/PALMYR/>

**E. W. Beth Centenary Conference**

Date: 15-16 September 2008

Location: Trippenhuis, Royal Academy, Kloveniersburgwal 29, Amsterdam

Website: <http://www.illc.uva.nl/NewsandEvents/newsitem.php?id=2466>

**Graduate Philosophy Conference on Normativity**

Date: 29-30 August 2008

Location: Universiteitsbibliotheek, Singel 425, 1012 WP Amsterdam

Website: <http://www.illc.uva.nl/normativity/>

**ESSLLI-2008: 20th European Summer School in Logic, Language and Information**

Date: 4-15 August 2008

Location: Hamburg, Germany

Website: <http://www.illc.uva.nl/ESSLLI2008/>

**Logic and the Foundations of Game and Decision Theory (LOFT 2008)**

Date: 3-5 July 2008

Location: ILLC, Amsterdam, The Netherlands

Website: <http://www.illc.uva.nl/LOFT2008/>

**DGL08: Second Workshop in Decisions, Games and Logic**

Date: 30 June-2 July 2008

Location: ILLC, Amsterdam

Website: <http://www.meansandends.com/workshop08/>

**3rd MARA Get-Together: Workshop on Multiagent Resource Allocation**

Date: 5-6 June 2008

Location: ILLC, Amsterdam

Website: <http://www.illc.uva.nl/~ulle/MARA3/>

**ILLC/ACLIC joint workshop**

Date: 11 April 2008

Location: Aula Allard Pierson museum, Amsterdam

Website: <http://www.hum.uva.nl/aclc/object.cfm/4317883A-3102-4F8A-A31CBC1402EBC5E4/C37891A6-1321-B0BE-68306A60B4AB8E42>

**Logic and the Simulation of Interaction and Reasoning (Symposium at AISB 2008)**

Date: 3-4 April 2008

Location: Aberdeen, Scotland

Website: [http://www.illc.uva.nl/GLoRiClass/index.php?page=8\\_1](http://www.illc.uva.nl/GLoRiClass/index.php?page=8_1)

**Workshop on Modal Fixpoint Logics**

Date: 25-27 March 2008

Location: ILLC, Amsterdam

Website: <http://staff.science.uva.nl/~yde/mfl>

**GLLC 15: The Dynamics of Preferences and Intentions**

Date: 26-28 February 2008

Location: ILLC, Amsterdam

Website: <http://staff.science.uva.nl/~oroy/GLLC15/>

**Gloriclass Halftime Event**

Date and time: Wednesday 13 February 2008

Location: Doelenzaal, Universiteitsbibliotheek, Singel 425, Amsterdam.

Website: <http://www.illc.uva.nl/GLoRiClass/index.php?page=11>

