Institute for Language, Logic and Information
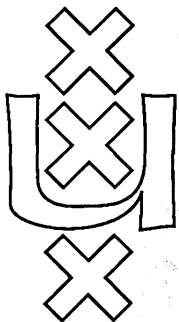
ANNUAL REPORT 1989

University of Amsterdam

The ITLI Prepublication Series

1986

The Institute of Language, Logic and Information

86-01

86-02 Peter van Emde Boas   A Semantical Model for Integration and Modularization of Rules
86-03 Johan van Benthem   Categorial Grammar and Lambda Calculus
86-04 Reinhard Muskens   A Relational Formulation of the Theory of Types
86-05 Kenneth A. Bowen, Dick de Jongh   Some Complete Logics for Branched Time, Part I   Well-founded Time,
86-06 Johan van Benthem   Logical Syntax   Forward looking Operators

1987   87-01 Jeroen Groenendijk, Martin Stokhof   Type shifting Rules and the Semantics of Interrogatives
87-02 Renate Bartsch   Frame Representations and Discourse Representations
87-03 Jan Willem Klop, Roel de Vrijer   Unique Normal Forms for Lambda Calculus with Surjective Pairing
87-04 Johan van Benthem   Polyadic quantifiers
87-05 Víctor Sánchez Valencia   Traditional Logicians and de Morgan's Example
87-06 Eleonore Oversteegen   Temporal Adverbials in the Two Track Theory of Time
87-07 Johan van Benthem   Categorial Grammar and Type Theory
87-08 Renate Bartsch   The Construction of Properties under Perspectives
87-09 Herman Hendriks   Type Change in Semantics: The Scope of Quantification and Coordination

1988 LP-88-01 Michiel van Lambalgen   *Logic, Semantics and Philosophy of Language:*   Algorithmic Information Theory
LP-88-02 Yde Venema   Expressiveness and Completeness of an Interval Tense Logic
LP-88-03   Year Report 1987
LP-88-04 Reinhard Muskens   Going partial in Montague Grammar
LP-88-05 Johan van Benthem   Logical Constants across Varying Types
LP-88-06 Johan van Benthem   Semantic Parallels in Natural Language and Computation
LP-88-07 Renate Bartsch   Tenses, Aspects, and their Scopes in Discourse
LP-88-08 Jeroen Groenendijk, Martin Stokhof   Context and Information in Dynamic Semantics
LP-88-09 Theo M.V. Janssen   A mathematical model for the CAT framework of Eurotra
LP-88-10 Anneke Kleppe   A Blissymbolics Translation Program
ML-88-01 Jaap van Oosten   *Mathematical Logic and Foundations:*   Lifschitz' Realizabiility
ML-88-02 M.D.G. Swaen   The Arithmetical Fragment of Martin Löf's Type Theories with weak Σ-elimination
ML-88-03 Dick de Jongh, Frank Veltman   Provability Logics for Relative Interpretability
ML-88-04 A.S. Troelstra   On the Early History of Intuitionistic Logic
ML-88-05 A.S. Troelstra   Remarks on Intuitionism and the Philosophy of Mathematics
CT-88-01 Ming Li, Paul M.B.Vitanyi   *Computation and Complexity Theory:* Two Decades of Applied Kolmogorov Complexity
CT-88-02 Michiel H.M. Smid   General Lower Bounds for the Partitioning of Range Trees
CT-88-03 Michiel H.M. Smid, Mark H. Overmars   Maintaining Multiple Representations of
     Leen Torenvliet, Peter van Emde Boas   Dynamic Data Structures
CT-88-04 Dick de Jongh, Lex Hendriks   Computations in Fragments of Intuitionistic Propositional Logic
     Gerard R. Renardel de Lavalette
CT-88-05 Peter van Emde Boas   Machine Models and Simulations (revised version)
CT-88-06 Michiel H.M. Smid   A Data Structure for the Union-find Problem having good Single-Operation Complexity
CT-88-07 Johan van Benthem   Time, Logic and Computation
CT-88-08 Michiel H.M. Smid, Mark H. Overmars   Multiple Representations of Dynamic Data Structures
     Leen Torenvliet, Peter van Emde Boas
CT-88-09 Theo M.V. Janssen   Towards a Universal Parsing Algorithm for Functional Grammar
CT-88-10 Edith Spaan, Leen Torenvliet, Peter van Emde Boas Nondeterminism, Fairness and a Fundamental Analogy
CT-88-11 Sieger van Denneheuvel, Peter van Emde Boas   Towards implementing RL
X-88-01 Marc Jumelet *Other prepublications:*   On Solovay's Completeness Theorem

1989 LP-89-01 Johan van Benthem *Logic, Semantics and Philosophy of Language:* The Fine-Structure of Categorial Semantics
LP-89-02 Jeroen Groenendijk, Martin Stokhof   Dynamic Predicate Logic, towards a compositional,
     non-representational semantics of discourse
LP-89-03 Yde Venema   Two-dimensional Modal Logics for Relation Algebras and Temporal Logic of Intervals
LP-89-04 Johan van Benthem   Language in Action
LP-89-05 Johan van Benthem   Modal Logic as a Theory of Information
LP-89-06 Andreja Prijatelj   Intensional Lambek Calculi: Theory and Application
LP-89-07 Heinrich Wansing   The Adequacy Problem for Sequential Propositional Logic
LP-89-08 Víctor Sánchez Valencia   Peirce's Propositional Logic: From Algebra to Graphs
LP-89-09 Zhisheng Huang   Dependency of Belief in Distributed Systems
ML-89-01 Dick de Jongh, Albert Visser   *Mathematical Logic and Foundations:* Explicit Fixed Points for Interpretability Logic
ML-89-02 Roel de Vrijer   Extending the Lambda Calculus with Surjective Pairing is conservative
ML-89-03 Dick de Jongh, Franco Montagna   Rosser Orderings and Free Variables
ML-89-04 Dick de Jongh, Marc Jumelet, Franco Montagna   On the Proof of Solovay's Theorem
ML-89-05 Rineke Verbrugge   Σ-completeness and Bounded Arithmetic
ML-89-06 Michiel van Lambalgen   The Axiomatization of Randomness
ML-89-07 Dirk Roorda   Elementary Inductive Definitions in HA: from Strictly Positive towards Monotone
ML-89-08 Dirk Roorda   Investigations into Classical Linear Logic
ML-89-09 Alessandra Carbone   Provable Fixed points in $I\Delta_0 + \Omega_1$
CT-89-01 Michiel H.M. Smid   *Computation and Complexity Theory:*   Dynamic Deferred Data Structures
CT-89-02 Peter van Emde Boas   Machine Models and Simulations
CT-89-03 Ming Li, Herman Neuféglise, Leen Torenvliet, Peter van Emde Boas   On Space Efficient Simulations
CT-89-04 Harry Buhrman, Leen Torenvliet   A Comparison of Reductions on Nondeterministic Space
CT-89-05 Pieter H. Hartel, Michiel H.M. Smid   A Parallel Functional Implementation of Range Queries
     Leen Torenvliet, Willem G. Vree
CT-89-06 H.W. Lenstra, Jr.   Finding Isomorphisms between Finite Fields
CT-89-07 Ming Li, Paul M.B. Vitanyi   A Theory of Learning Simple Concepts under Simple Distributions and
     Average Case Complexity for the Universal Distribution (Prel. Version)
CT-89-08 Harry Buhrman, Steven Homer   Honest Reductions, Completeness and
     Leen Torenvliet   Nondeterminstic Complexity Classes
CT-89-09 Harry Buhrman, Edith Spaan, Leen Torenvliet   On Adaptive Resource Bounded Computations
CT-89-10 Sieger van Denneheuvel   The Rule Language RL/1
CT-89-11 Zhisheng Huang, Sieger van Denneheuvel Towards Functional Classification of Recursive Query Processing
     Peter van Emde Boas
X-89-01 Marianne Kalsbeek   *Other Prepublications:*   An Orey Sentence for Predicative Arithmetic
X-89-02 G. Wagemakers   New Foundations: a Survey of Quine's Set Theory
X-89-03 A.S. Troelstra   Index of the Heyting Nachlass
X-89-04 Jeroen Groenendijk, Martin Stokhof   Dynamic Montague Grammar, a first sketch
X-89-05 Maarten de Rijke   The Modal Theory of Inequality
X-89-06 Peter van Emde Boas   Een Relationele Semantiek voor Conceptueel Modelleren: Het RL-project

1990   SEE INSIDE BACK COVER
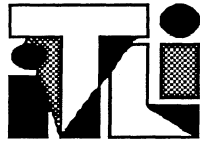
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1012CP Amsterdam

ANNUAL REPORT 1989

Contents

1. The Institute for Language, Logic and Information (ITLI)

ITLI started in 1986 as an association of the following people from the permanent staff of the University of Amsterdam.

Staff

Department of Mathematics and Computer Science (M&C)
- Johan van Benthem (chair of Mathematical Logic)
- Kees Doets
- Peter van Emde Boas (chair of Theoretical Computer Science)
- Theo Janssen
- Dick de Jongh
- Leen Torenvliet
- Anne Troelstra (chair of Foundations of Mathematics)
- Paul Vitányi (chair of Theoretical Computer Science)

Department of Philosophy (Ph)
- Renate Bartsch (chair of Philosophy of Language)
- Jeroen Groenendijk
- Martin Stokhof
- Frank Veltman
- Roel de Vrijer

In the meantime, further colleagues have joined:

Department of Computational Linguistics
- Remco Scha (chair of Computational Linguistics)

Centre for Mathematics and Computer Science
- Krzysztof Apt
- Jan van Eyck

In addition, about 15 research assistants are directly involved.

At present, ITLI has the following board:
Renate Bartsch, Johan van Benthem, Peter van Emde Boas.

Correspondence can be addressed to the acting ITLI directors:

- Johan van Benthem
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  The Netherlands Phone 020–5255807
  e-mail: johan@fwi.uva.nl
- Martin Stokhof Department of Philosophy,
  University of Amsterdam
  Nieuwe Doelenstraat 15, 1012 CP Amsterdam,
  The Netherlands Phone 020–5254540/5254500
  e-mail: stokhof@alf.let.uva.nl

2. Research

2.1 General Areas

ITLI research takes place within the framework of the research program Logic, Semantics and Algorithmics. This multidisciplinary research program is divided into four clusters: Logic and Foundations of Mathematics; Logic and Semantics; Computation and Complexity; and Theory of Interpretation.

Research in the first cluster elaborates on a long-standing Dutch tradition in constructive mathematics, especially intuitionism, but the platonistic and the formalistic approach to the foundations of mathematics are represented too: model theory / set theory and proof theory / lambda calculus (Troelstra, van Benthem, Doets, de Jongh).

Within the second cluster falls the research on topics that connect the study of formal, natural and programming languages. Main themes include intensional logic, categorial grammar, dynamic logic, epistemic semantics, compositionality and partiality (van Benthem, van Emde Boas, de Jongh, Janssen).

The third cluster comprises research in the areas of structural complexity theory, machine models, descriptive complexity, dynamic data structures, complexity aspects of logical systems and algorithmic aspects of databases (van Emde Boas, Vitányi, Torenvliet).

The final cluster centers around two themes: meaning and discourse, and philosophical foundations of a theory of interpretation. The purpose is to develop one comprehensive formal theory of interpretation, integrating a broadly conceived Montague grammar, with competing developments like discourse representation theory and situation semantics. Key topics are the dynamics of interpretation, partiality of information and flexibility in syntax and semantics (Bartsch, Groenendijk, Stokhof, Veltman, de Vrijer, Swart).

Over the past decade, these research lines have often interacted, resulting in a collaboration of which ITLI's foundation and the common research program is a natural outcome. For instance, there is joint work in progress on such topics as epistemic semantics and pragmatics, Montague grammar and type theory, dynamic reasoning and default logic, and semantics of programming languages. In this convergence, the research of the Amsterdam group is stimulated by various national and international contacts.

2.2 Specific Projects

A more detailed description of the above research lines, as currently pursued, is as follows.

Logic and foundations of mathematics

All standard fields of mathematical logic are represented. In foundational studies the constructive approach is dominant, witness several ongoing individual projects in the field of intuitionism and constructive mathematics generally. These are concerned with such topics as realizability and Martin-Löf type theories. Furthermore, there is a special interest in

- (finite) model theory;
- model theory and proof theory for lambda calculus, type theory and linear logic;
- bounded arithmetic, provability and interpretability logic;
- applications of proof theory in the foundations of categorial grammar.

Logic and semantics

In this area, logical techniques are applied to modelling natural, formal and programming languages. Specific topics of current interest include:

- generalized quantifiers
- connections between categorial grammar and lambda calculus
- nonmonotonic reasoning , dynamic logic and relational algebra

Moreover, almost every branch of intensional logic is being studied, both from a philosophical and a mathematical point of view. For instance, projects are under way in

- enriched formalisms for modal logic, including epistemic logic;
- interval structures in tense logic;
- default reasoning in conditional logic.

One common tendency in all this research is to develop new modellings: both by employing partial models and by using dynamic interpretation rules.

Computation and complexity

Theoretical computer science as currently practiced in Amsterdam has the following research lines:

- semantics of programming languages, including Montague semantics for 'intensional' phenomena, dynamic logic and minimal–model semantics of logic programming;
- mathematical complexitity theory, both theoretical and applied;

- theory of databases, including the development of query languages and knowledge representation.
- theoretical foundations of machine translation between natural languages.

Theory of interpretation

This area is a mixture of descriptive and theoretical work.
- descriptive topics include: quantifier phrases and determiners generally, modal and epistemic expressions, conditional sentences, comparatives and temporal expressions;
- in addition to indicative speech acts, questions and answers are being studied (both semantically and pragmatically);
- the scope of description is presently being widened from the sentence level to that of texts.
- another research line is the development of a general theory of 'semantic universals', in the spirit of linguistic universal grammar.

Special attention is given to Montague grammar and congenial syntactic theories, such as categorial grammar and generalized phrase structure grammar. Specific topics are:
- syntactic power, especially in flexible versions with changing categories and shifting types;
- the mechanism of interpretation, especially questions of compositionality and semantic constraints on Montague grammar; application of Montague grammar in machine translation
- extensions and refinements of the paradigm, e.g., the prospects of discourse representation, and the dynamic role of context;
- the integretation of lexical semantics into sentence and text semantics and pragmatics.

2.3 Publications 1989

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language, in: U. Ammon (ed.), *Status and function of language and language
varieties*, Walter de Gruyter, Berlin - New York.

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Holland, Amsterdam, 1989, p. 331-375.

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In: H. Schnelle & N-O Bernsen, (eds); *Logic and linguistics. Research
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representation and inference*, Academic Press, London.

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Richards, J. Bethke & J. Oberlander (eds.), *Temporal representation and
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Does, J.M. van der; Indexed operators and completeness, in: J. M. van der

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Doets, H.C.; Monadic Π^1_1-theories of Π^1_1-properties.
Notre Dame Journal of Formal Logic, 30, 1989, p. 224-240.

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In: J.W. Klop, J.J.Ch. Meyer, (et al); *J.W. de Bakker, 25 jaar semantiek*, CWI, Amsterdam, 1989, p. 219-227.

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Emde Boas, P. van; Space measures for storage modification machines.
Inf. Processing Letters, 30, 1989, p. 103-110.

Emde Boas, P. van; Cryptosystemen gebaseerd op de complexiteitstheorie; kunnen zij bestaan? In: *Symposiumcie cryptografie*, (ed); Symposiumverslag Priem-getallen en Privacy, Studievereniging A-Eskwadraat, Utrecht, 1989, p. 16-31.

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multiple representations of dynamic data structures. *Information and
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Emde Boas; Multiple representations of dynamic data structures.
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Spaan, E., L. Torenvliet, P. van Emde Boas; Nondeterminism, fairness
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woordenboek van Nederland* III, Instituut voor Nederlanse geschiedenis,
's-Gravenhage, 1989, p. 254-256.

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  in: H. Parret (red.), *In alle redelijkheid. Standpunten over het denken, spreken en handelen van de redelijke mens*, Boom, Meppel.

Vrijer, R. de; Extending the lambda calculus with surjective pairing is conservative, in: *Proceedings of the fourth annual symposium on logic in computer science*, IEEE Computer Society Press, Washington, p. 204-215.

2.4 Current Ph.D projects

[computer science abbreviated C, mathematics M, philosophy P;
the Netherlands Organization for the Advancement of Research N.W.O.]

1. Pieter Adriaans (Software Intermediate/C):
    Semantic driven parsing and modelling
2. Wieb Bosma, Marc-Paul van der Hulst (NWO/M):
    Primality tests
3. Harry Buhrman (C):
    Developing tools in structural complexity theory
4. Paul Dekker (NWO/P):
    Flexibility in syntax and semantics
5. Sieger van Denneheuvel (C):
    Constraint solving for databases
6. Jaap van der Does (DYANA/P):
    Quantifiers, infinitives and intervals
7. Herman Hendriks (DYANA/P):
    Flexible interpretation
8. Marianne Kalsbeek (NWO/P Utrecht):
    Interpretability and bounded arithmetic
9. Karen Kwast (C):
    Non–classical logic for database semantics
10. Sjaak van Leeuwen (NWO/P):
    Ontological necessity and formal semantics
11. Jaap van Oosten (M):
    Lifschitz-realizability and intuitionistic analysis
12. Maarten de Rijke (NWO/M&P):
    Enriched modal formalisms
13. Dirk Roorda (DYANA/M):
    Proof theory of linear logic
14. Ernest Rotterdam, Fred de Geus (RUG-Medes/C):
    Anesthesia support system
15. Victor Sánchez Valencia (NWO/M&P):
    Traditional logic and modern semantics: distribution and monotonicity
16. Harold Schellinx (M)
    Linear logic and type theory
17. Edith Spaan (C):
    Complexity theory
18. Yde Venema (M):
    Tense logic and interval semantics

19. Rineke Verbrugge (NWO/M)
    Interpretability and bounded arithmetic
20. Huang Zhiseng (visitor peoples republic of China/C):
    Non-classical logic for database semantics

Finally, there are some joint projects with other institutes, including:

21. Yao-Hua Tan (NWO, Free University Amsterdam):
    Non–monotonic reasoning; its sources and logical structure
22. Joop Houtman (NWO, University of Groningen):
    Functional composition and type–raising
23. Elias Thijsse (University of Tilburg):
    Knowledge representation and epistemic logic
24. Kees van Deemter (Institute for Perception Research, Eindhoven):
    Formal semantics and natural language processing
25. Michael Morreau (Seminar für Natürlich-Sprachliche Systeme, University of
    Tübingen): Non-monotonic reasoning
26. Patrick Blackburn (Centre for Cognitive Science, Edinburgh):
    Nominal tense logic
27. Heinrich Wansing (Philosophical Institute, Free University Berlin):
    Categorial grammar and relevant logic

2.5 Dissertations 1989

- Reinhard Muskens, *Meaning and Partiality*
- Eleonore Oversteegen, *Tracking Time*
- Michiel Smid, *Dynamic Data Structures on Multiple Storage Media*
- Marco Swaen, *Weak and Strong Sum-elimination in Intuitionistic Type Theory*

3. Teaching

3.1 Courses

The following list of courses gives an indication of the training which students at ITLI are supposed to acquire.

Philosophy
* philosophy of language, an introduction
* logic, language and meaning: historical and systematic
* recent developments in the semantics of natural language
* logic, an introduction
* metalogic
* philosophical logic, a survey
* intensional logic

Mathematics
* sets and models
* recursion theory
* lambda calculus and the theory of types
* intuitionism

Computer science
* formal languages and automata
* complexity theory
* semantics of programming languages
* logic and artificial intelligence

In addition, each year various advanced courses and colloquia are organized on selected topics. In 1989 these included
* theory of automatic translation
* formal methods in AI
* partial logics
* intentionality
* formal arithmetic
* categorial grammar and lambda calculus
* linear logic

This ITLI curriculum lies in a wider environment of related courses in the Faculty of Humanities and the Department of Mathematics and Computer Science.

3.2 Master theses 1989

- A. Borghuis, Semantische netwerken en conditionele logica.
- M. Greveling, Het afscheid van het afscheid van de metafysica.
- W. Groeneveld, A dynamical analysis of paradoxical sentences.
- E. Huisjes, Impliciet geloof.
- M. Kalsbeek, An Orey-sentence for predicative arithmetic
- M. Leezenberg, Compositional semantics of metaphor.
- M. de Rijke, Some chapters of interpretability logic.
- H. Schellinx, Isomorphisms, non-isomorphisms and extensionalisations of graph models.
- H. Steinberg, De taal- relativiteitshypothese van B. L. Whorf.
- G. Wagemakers, New Foundations, a survey of Quine's set theory.
- L. Zeef, Bliss Symbolen.

3.3 Post graduate training

ITLI participates in the national postgraduate Network for Logic, Language and Information (TLI), which received a grant for five years from the Dutch Ministry of Education. In this network the University of Amsterdam cooperates with the universities of Groningen, Utrecht, Nijmegen and Tilburg in the interdisciplinary field of mathematical logic, philosophical logic, linguistics, philosophy of language and computer science. The network coordinates postgraduate training in this field on a national scale, and finances nine four-year postgraduate scholarships ('AIO-plaatsen'). ITLI's partners in TLI are the following groups:

University of Groningen (RUG)
- Faculty of Humanities (Zwarts, Zonneveld, Vet, Molendijk, de Mey, de Vuyst)

University of Utrecht (RUU)
- Faculty of Humanities (Moortgat, Verkuyl)
- Department of Philosophy (Bergstra, van Dalen, Koymans, Renardel de Lavalette, Visser)
- Department of Mathematics (van Leeuwen, van Dalen, Moerdijk, Kok)

University of Nijmegen (KUN)
- Department of Philosophy (Seuren, van der Sandt)
- Department of Mathematics and Computer Science (Barendregt, Terlouw, Veldman)

University of Tilburg (KUB)
- Faculty of Humanities (Bunt, Thijsse, Kolb, Muskens)

TLI furthermore publishes a newsletter containing announcements, all information about the activities of the network and other relevant information for participants in the network as well as colleagues in the field at large.

3.4 European Summer School

ITLI has joined in an interuniversitary program of cooperation, the European Doctoral Network for the Study of Language, Logic and Information. This program was granted by the Commission of the European Communities within the framework of the Erasmus Program. Universities from the following cities are participants: Groningen, Leuven, Aarhus, Tübingen, Madrid, Toulouse, Dublin, Amsterdam, London and Edinburgh. The cooperation involves a mutual exchange program that enables students to continue and complete their studies at a host university.

Participants in the program were also involved in the organization of the first European Summer School in Natural Language Processing, Logic and Knowledge Representation, which was held in Groningen, June 5 to 17. The summer school was an initiative of the University of Groningen (Erasmus grant holder), and the universities of Edinburgh and Tübingen. In a later stage, members of the DYANA project (see below, 4.2), the HCRC Interdisciplinary Research Centre for Human Communication (Edinburgh) and the TLI-network became involved.

The main goal of the summer school was to bring together from across Europe staff and students from the relevant fields of research, and to intensify, and extend the range of their scientific exchange.

For this purpose, three kinds of events were provided:

- Introductory courses related to the three themes natural language processing, logic, and knowledge representation
- Advanced courses on dynamic semantics, morphology, event semantics, file change semantics, the semantics of unification, inconsistency, aspect, context dependency, and update semantics.

14

- Workshops on discourse semantics, tense and aspect, logic programming, human reasoning, the frame problem, and categorial grammar and type theory.

The summer school was visited by more than three hundred people from all over Europe and from the United States. Its second instalment will be held at the University of Leuven, July 30 to August 10, 1990. It is intended to turn this event into an annual European tradition.

4. Other Activities

4.1 Cooperation

ITLI is committed to broader scientific contacts outside of its 'inner circle'.

For a start, in Amsterdam itself, through various joint appointments, ITLI serves as a link between its sponsoring departments, while there are also official ties with the Faculty of Humanities (linguistics, computer science and the humanities) and the Centre for Mathematics and Computer Science (CWI). Recent appointments at the latter two sites (Zeevat, Reape in computational linguistics, van Eyck at the CWI) are expected to enhance this collaboration.

At a national level, the earlier-mentioned TLI Network is a common enterprise for training Ph.D. students. Currently, discussions are under way concerning the advisability of turning this collaboration into a national Graduate School or Research Institute. More concretely, the bi-weekly "Montague Colloquium" (succeeded by the present "ITLI Colloquium") provides a forum for the Dutch semanticists, as well as visitors from abroad. Likewise, the "Intercity Colloquium" which is held every two weeks in either Amsterdam or Utrecht reflects national collaboration in the field of mathematical logic and the philosophy of mathematics.

In Europe, ITLI's international orientation was further institutionalized in 1989 by its participation in the Esprit Basic Research Action Dynamic Interpretation of Natural Language (DYANA, see 4.2). In this project, ITLI cooperates with the Centre for Cognitive Science of the University of Edinburgh, the Seminar für natürlich-sprächliche Systeme of the University of Tübingen and the Institut für Maschinelle Sprachverarbeitung of the University of Stuttgart.
Moreover, its bi-annual "Amsterdam Colloquia", started in 1976, have become well-known gatherings of the international community (see 4.3).

Individually, ITLI–members maintain regular contacts with such further centers of semantic research as the Center for the Study of Language and Information (Stanford University), the Department of Linguistics at Amherst (University of Massachusetts), the Cognitive Science Center at Austin (University of Texas), the Department of Modern Language and Linguistics at Ithaca (Cornell University), the Department of Mathematics at Siena (University of Siena), the Steklov Institute (Moscow), the Department of Mathematics at Oslo (COSMOS, University of Oslo) and the already mentioned DYANA partners.

4.2 Esprit Basic Research Action: DYANA

From February 1989, ITLI is involved in a Esprit Basic Research Action, called Dynamic Interpretation of Natural Language (DYANA). The project covers a period of two and a half years, with the possibility of continuation. The other participants are the Centre for Cognitive Science of the University of Edinburgh, the Seminar für natürlich-sprachliche Systeme of the University of Tübingen and the Institut für maschinelle Sprachverarbeitung of the University of Stuttgart.
This action in Esprit Basic Research is concerned with fundamental questions about the integration of logic, natural language and speech. The programme will focus on the themes of partial information and dynamic interpretation in natural language processing, with particular attention to the goal of developing a computational and cognitively motivated model of how spoken language is understood. The following are some of the key research questions:

- What declarative theory of grammar (extending from phonetics to discourse) would best support incremental interpretation and top-down information flow?
- How can existing unification-based grammar formalisms be developed so as to increase their ability to express high-level generalizations, while retaining a clear semantics and a computational interpretation?
- How is the informational content of an utterance dynamically integrated into the current discourse context?
- What formal models can adequately capture the defeasibility and non-monotoning character of human reasoning?
- To what extent is it possible to synthesize the formal methods used for modelling partial information in speech, grammar, semantics and reasoning?

Participation in this project has brought ITLI four new jobs at post-doc level for a period of two and a half years, with the possibility of continuation.

17

4.3 Seventh Amsterdam Colloquium

The 1989 edition of the Amsterdam Colloquium was the seventh (and last) in a series which started in 1976. The series was originally an initiative of the Department of Philosophy, and the last two editions of the colloquium were organized by ITLI.

The colloquium took place December 19-22, 1989. It was visited by more than one hundred visitors from Eastern and Western Europe, Japan, Israel, Canada and the United States. Within Europe, this is certainly the oldest continuous meeting place for colleagues in the area, whose Proceedings have a wide circulation. In the future, the Colloquium may actually be merged in a broader European scheme of conferences.

For the organization of the Seventh Amsterdam Colloquium additional financial support was received from the Koninklijke Nederlandse Akademie van Wetenschappen (the Royal Dutch Academy of Sciences). The organizing committee consisted of Martin Stokhof, Leen Torenvliet and Marjorie Pigge (secretary). Scientific activities were the following:

Invited lectures

- Gennaro Chierchia (Linguistics, Cornell University, Ithaca):
  Anaphora and Dynamic Logic
- Peter Gärdenfors (Philosophical Institute, University of Lund):
  The Emergence of Meaning
- Stanley H. Peters (CSLI, Stanford):
  Why I am a Situation Semanticist
- Richmond H. Thomason (ISP, University of Pittsburgh):
  Propagating Epistemic Coordination through Mutual Defaults

Contributed talks

- Nicholas Asher (CCS, Texas, Austin):
  Semantics for Derived Nominal and Gerundive Constructions
- Martin H. van den Berg (Computational Linguistics, Amsterdam):
  A Dynamic Logic for Plurals
- Stephan Berman (Department of Linguistics, Massachusetts, Amherst):
  Towards the Semantics of Open Sentences: Wh-phrases and Indefinites
- Wojciech Buszkowski (Institute of Mathematics, Poznan):
  Remarks on Autoepistemic Logic
- Kees van Deemter (IPR, Eindhoven):
  Forward References in Natural Language

- Paul Dekker (ITLI, Amsterdam):
  Dynamic Interpretation, Flexibility and Monotonicity
- Jaap van der Does (ITLI, University of Amsterdam):
  A Generalized Quantifier Logic for Naked Infinitives
- Martin Emms (CCS, Edinburgh):
  Polymorphic Quantifiers
- Roel de Vrijer, Jeroen Groenendijk en Martin Stokhof (ITLI, Amsterdam):
  Dynamic Deduction
- Herman Hendriks (ITLI, Amsterdam):
  Flexible Montague Grammar
- Jack Hoeksema (Department of Linguistics, Pennsylvania, Philadelphia):
  Exploring Exception Phrases
- Hing-Kai Hung (Department of Computer Science, New York, Buffalo):
  Applications of Intensional Logic to Program Semantics
- Theo M.V. Janssen (ITLI, Amsterdam):
  Models for Discourse Markers
- Nirit Kadmon (Department of Linguistics, Beer Sheva) and Fred Landman (Department of Linguistics, Cornell University, Ithaca):
  Polarity Sensitive Any
- László Kálmán (RIL, Hungarian Academy of Sciences, Budapest):
  Deferred Information Representation Theory
- Manfred Krifka (SNS, Tübingen):
  Polarity Phenomena and Alternative Semantics
- Jan Tore Lønning (Department of Linguistics and Philosophy, Oslo):
  Plurality and Secondorderization
- Alice ter Meulen (Department of Philosophy and Linguistics, Bloomington):
  English Aspectual Verbs as Generalized Quantifiers
- J.-J.Ch. Meyer (Mathematics and Computer Science, Amsterdam):
  An analysis of the Yale Shooting Problem by Means of
  Dynamic Epistemic Logic
- Tamás Mihálydeák (Department of Philosophy, Debrecen):
  Extended Partiality in Intensional Logic
- Friederike Moltmann (Department of Linguistics, MIT, Boston):
  The Determination of Part Structures in Natural Language
- Michael Moortgat (OTS, Utrecht):
  Cut Elimination and the Elimination of Spurious Ambiguity
- Michael Morreau (SNS, Tübingen):
  Epistemic Semantics for Conditionals
- Glyn Morrill (CCS, University of Edinburgh):
  Grammar and Logical Types
- Hub Prüst and Remko Scha (Computational Linguistics, Amsterdam):
  A Discourse Perspective on VP Anaphora

- Roger Schwarzschild (Department of Linguistics, Massachusetts, Amherst):
  Against Groups
- Maria Stambolieva (LML, Bulgarian Academy of Sciences, Sofia):
  Notes on Aspect in Bulgarian and English
- Henriëtte de Swart (Department of Romance Languages, Groningen):
  Non-quantificational Readings of Adverbs
- Anna Szabolcsi (Hungarian Academy of Sciences, Budapest) and Frans Zwarts (Department of Linguistics, Groningen):
  Functional Composition in Combinatory Grammar and
  the Distribution of Wh-quantifiers
- Elias G.C. Thijsse (ITK, Tilburg):
  Partial Logic and Modal Logic: a Systematic Survey
- Henk Verkuyl (OTS, Utrecht):
  Did the Guns of Navarone Hit Miles Twice?
- Frans Voorbraak (Department of Philosophy, Utrecht):
  Conditionals, Probability, and Belief Revision
- Hanna Walinska de Hackbeil (CWI, Amsterdam):
  The Syntax of Slavic Aspect
- Huang Zisheng (ITLI, Amsterdam):
  Dependency of Belief in Distributed Systems
- Alessandro Zucchi (Department of Linguistics, Rochester):
  The Propositional Interpretation of Noun Phrases
- Joost Zwarts (OTS, Utrecht):
  Kinds and Generic Terms

A volume of Proceedings (edited by M. Stokhof and L. Torenvliet) will be published in Amsterdam, spring 1990.

4.4 ITLI Colloquium

The ITLI Colloquium meets every forthnight. In 1989 the following talks were given (the order is chronological):

- Pieter Adriaans (SIH Kockengen):
    Kategoriale kennissystemen
- Co Vet (RU Groningen):
    Werkwoordstijden en discourse representatie
- Erik-Jan van der Linden (ITK Tilburg):
    Idiomen in flexibele categoriale grammatica
- Dirk Heylen (INL Leiden) en Ton van der Wouden (OTS Utrecht):
    Categoriale categorieën en programmeerparadigma's
- Reinhard Muskens (ITK Tilburg):
    Namen
- Krzystof R. Apt (CWI Amsterdam):
    Logic Programming and non-monotonic reasoning:
        Application to natural language understanding
- Hanna Walinska (CWI Amsterdam):
    The syntax and semantics of slavonic aspect
- René Ahn (ITK Tilburg):
    Discourse representation meets constructive mathematics
- M. Willems en C. Hoede (UT Enschede):
    Kennisgrafen en natuurlijke taal
- Roel de Vrijer (ITLI Amsterdam):
    Deductie in dynamische predicaat logica

4.5 ITLI Prepublication Series

1988

Logic, Semantics and Philosophy of Language:

LP-88-01 Michiel van Lambalgen   Algorithmic Information Theory
LP-88-02 Yde Venema   Expressiveness and Completeness of an
                                  Interval Tense Logic
LP-88-03 Annual Report 1987
LP-88-04 Reinhard Muskens   Going partial in Montague Grammar
LP-88-05 Johan van Benthem   Logical Constants across Varying Types
LP-88-06 Johan van Benthem   Semantic Parallels in Natural Language and
                                  Computation
LP-88-07 Renate Bartsch   Tenses, Aspects, and their Scopes in Discourse
LP-88-08 Jeroen Groenendijk, Martin Stokhof
                                  Context and Information in Dynamic Semantics
LP-88-09 Theo M.V. Janssen
                        A mathematical model for the CAT framework of Eurotra
LP-88-10 Anneke Kleppe   A Blissymbolics Translation Program

Mathematical Logic and Foundations:

ML-88-01 Jaap van Oosten   Lifschitz' Realizability
ML-88-02 M.D.G. Swaen   The Arithmetical Fragment of Martin-Löf's
                                 Type Theories with weak Σ-elimination
ML-88-03 Dick de Jongh, Frank Veltman
                                 Provability Logics for Relative Interpretability
ML-88-04 A.S. Troelstra   On the Early History of Intuitionistic Logic
ML-88-05 A.S. Troelstra   Remarks on Intuitionism and the Philosophy
                                 of Mathematics

Computation and Complexity Theory:

CT-88-01 Ming Li, Paul M.B.Vitanyi
                          Two Decades of Applied Kolmogorov Complexity
CT-88-02 Michiel H.M. Smid
                  General Lower Bounds for the Partitioning of Range Trees

CT-88-03 Michiel H.M. Smid, Mark H. Overmars, Leen Torenvliet,
          Peter van Emde Boas   Maintaining Multiple Representations of
                                    Dynamic Data Structures
CT-88-04 Dick de Jongh, Lex Hendriks, Gerard R. Renardel de Lavalette
                          Computations in Fragments of Intuitionistic Propositional Logic
CT-88-05 Peter van Emde Boas
                                    Machine Models and Simulations (revised version)
CT-88-06 Michiel H.M. Smid   A Data Structure for the Union-find Problem
                                    having good Single-Operation Complexity
CT-88-07 Johan van Benthem   Time, Logic and Computation
CT-88-08 Michiel H.M. Smid, Mark H. Overmars,Leen Torenvliet, Peter van
          Emde Boas   Multiple Representations of Dynamic Data Structures
CT-88-09 Theo M.V. Janssen
                          Towards a Universal Parsing Algorithm for Functional Grammar
CT-88-10 Edith Spaan, Leen Torenvliet, Peter van Emde Boas
                                    Nondeterminism, Fairness and a Fundamental Analogy
CT-88-11 Sieger van Denneheuvel, Peter van Emde Boas
                                    Towards implementing RL

Other Publications:

X-88-01   Marc Jumelet   On Solovay's Completeness Theorem

1989

Logic, Semantics and Philosophy of Language:

LP-89-01 Johan van Benthem   Logic, Semantics and Philosophy of
                                    Language: The Fine-Structure of Categorial Semantics
LP-89-02 Jeroen Groenendijk, Martin Stokhof   Dynamic Predicate Logic,
                          towards a compositional, non-representational semantics of discourse
LP-89-03 Yde Venema   Two-dimensional Modal Logics for
                                    Relation Algebras and Temporal Logic of Intervals
LP-89-04 Johan van Benthem   Language in Action
LP-89-05 Johan van Benthem   Modal Logic as a Theory of Information
LP-89-06 Andreja Prijatelj   Intensional Lambek Calculi: Theory and Application
LP-89-07 Heinrich Wansing
                          The Adequacy Problem for Sequential Propositional Logic
LP-89-08 Víctor Sánchez Valencia
                          Peirce's Propositional Logic: From Algebra to Graphs
LP-89-09 Zhisheng Huang   Dependency of Belief in Distributed Systems

Mathematical Logic and Foundations:

ML-89-01 Dick de Jongh, Albert Visser
                              Explicit Fixed Points for Interpretability Logic

ML-89-02 Roel de Vrijer
         Extending the Lambda Calculus with Surjective Pairing is conservative

ML-89-03 Dick de Jongh, Franco Montagna   Rosser Orderings and Free Variables

ML-89-04 Dick de Jongh, Marc Jumelet, Franco Montagna
                              On the Proof of Solovay's Theorem

ML-89-05 Rineke Verbrugge Σ-completeness and Bounded Arithmetic

ML-89-06 Michiel van Lambalgen   The Axiomatization of Randomness

ML-89-07 Dirk Roorda   Elementary Inductive Definitions in HA:
                              from Strictly Positive towards Monotone

ML-89-08 Dirk Roorda   Investigations into Classical Linear Logic

ML-89-09 Alessandra Carbone   Provable Fixed Points in $I\Delta_0 + \Omega_1$

Computation and Complexity Theory:

CT-89-01 Michiel H.M. Smid   Dynamic Deferred Data Structures

CT-89-02 Peter van Emde Boas   Machine Models and Simulations

CT-89-03 Ming Li, Herman Neuféglise, Leen Torenvliet, Peter van Emde Boas
                              On Space Efficient Simulations

CT-89-04 Harry Buhrman, Leen Torenvliet
                A Comparison of Reductions on Nondeterministic Space

CT-89-05 Pieter H. Hartel, Michiel H.M. Smid, Leen Torenvliet
               A Parallel Functional Implementation of Range Queries

CT-89-06 H.W. Lenstra, Jr.   Finding Isomorphisms between Finite Fields

CT-89-07 Ming Li, Paul M.B. Vitanyi A Theory of Learning Simple Concepts
         under Simple Distributions and Average Case Complexity for
         the Universal Distribution (Prel. Version)

CT-89-08 Harry Buhrman, Steven Homer, Leen Torenvliet   Honest Reductions,
               Completeness and Nondeterminstic Complexity Classes

CT-89-09 Harry Buhrman, Edith Spaan, Leen Torenvliet
                        On Adaptive Resource Bounded Computations

CT-89-10 Sieger van Denneheuvel   The Rule Language RL/1

CT-89-11 Zhisheng Huang, Sieger van Denneheuvel, Peter van Emde Boas
           Towards Functional Classification of Recursive Query Processing

Other Publications:

4.6 GRASS Publication Series

ITLI is a partner in the GRASS publication series, published by Foris Publications (Dordrecht and Cinnaminson) together with colleagues from Bloomington, Groningen and Utrecht.

Managing Editors:
>   Alice ter Meulen (University of Indiana, Bloomington)
>   Martin Stokhof (University of Amsterdam).

Editorial Board:
>   Renate Bartsch (Amsterdam)
>   Johan van Benthem (Amsterdam)
>   Henk Verkuyl (Utrecht)
>   Co Vet (Groningen).

Titles which appeared in the past two years:

GRASS 9   Michael Moortgat:
>   *Categorial investigations.*
>   *Logical and linguistic aspects of the Lambek calculus.*

GRASS 10 Irena Bellert:
>   *Feature System for quantificational structures in natural*
>   *language.*

GRASS 11 Renate Bartsch, Peter van Emde Boas & Johan van Benthem, (eds.),
>   *Semantics and contextual expression.*

The ITLI Prepublication Series

1990