

Curriculum Vitae

Roussanka Loukanova

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Part I

CV Résumé

Name Roussanka Loukanova
Born 1954 Bulgaria
Gender female
WEB site <http://staff.math.su.se/rloukanova>
Languages English (fluent)
Bulgarian (native)
Russian (fluent while dormant)
Swedish (reading; simple writing; very simple, limited speech)
French (idle)

1 Education and Degrees

Bachelor program in Mathematics: 1973 – 1976

Faculty of Mathematics and Mechanics (current Faculty of Mathematics and Informatics)
Sofia University, Sofia, Bulgaria

M.Sc. program and degree in Mathematics: 1976 – 1978

M.Sc. degree in Mathematics: awarded July 1978

Specialization: Mathematical Logic

Department of Mathematical Logic and Applications

Faculty of Mathematics and Mechanics (current Faculty of Mathematics and Informatics)

Sofia University, Sofia, Bulgaria

M.Sc. thesis subject: Generalized Recursion Theory

M.Sc. dissertation: Pseudocombinatory Spaces and Recursiveness in Them

Adviser: Dr. Habil, Professor Dimiter Skordev

M.Sc. program and degree in Computer Science: 1998 – 1999

M.Sc. degree in Computer Science: awarded 28 February 2002

Department of Computer Science

Indiana University, Bloomington, IN, U.S.

Ph.D. program and degree in Mathematics: 1986 – 1991

Department of Discrete Mathematics, Faculty of Mechanics and Mathematics,

Moscow State University (MGU), Moscow, USSR — current Russia;

Saratov State University, Saratov, USSR — current Russia;

Department of Mathematics, University of Oslo, Norway, 1989 – 1990,

research work on my Ph.D. thesis, funded by

the Norwegian Research Council for Science and Humanities

Specialization code 01.01.09 — Mathematical Cybernetics

Subjects: Discrete Mathematics, Logic, Computability, Foundations of Computer Science,

Formal Languages, Automata Theory, Computational Linguistics, Language Processing

Ph.D. dissertation: Situation Semantical Analysis of Natural Language

Adviser: Dr. of Sc., Academician, Professor Valery Borisovich Kudryavtsev

Faculty of Mechanics and Mathematics, Moscow State University (MGU), Moscow, Russia

Co-supervision: Professor Jens Erik Fenstad
Department of Mathematics, University of Oslo, Norway
Awarded degree: Ph.D. in Physical and Mathematical Sciences;
date: 13 May 1992 by decision of Committee K063.74.04;
Issue date of Ph.D. diploma: 3 July 1992
KD No 010991, Moscow
Higher Testimonial Committee at the Council of Ministers of USSR
Saratov State University, Saratov, USSR — current Russia

2 Academic Qualification

- Senior Assistant Professor in Mathematics
(by academic regulations in Bulgaria, including of IMI, BAS, it is as in June 29 1992, when awarded, by leaving abroad in June 1997), possibly approximating Associate Professor in Mathematics
Department of Mathematical Logic and Applications
Faculty of Mathematics and Informatics, Sofia University
Sofia, Bulgaria (June 29 1992)
- Universitetslektor — Senior Lecturer / Associate Professor in Computational Linguistics
Uppsala University, Uppsala, Sweden (February 1 2002)
- Associate Professor in Computer Science — an assessment by an international committee at Aalborg University, Denmark (13 April 2015)

3 Pedagogic Training

- Continuous work in the educational system of the Faculty of Mathematics and Informatics, Sofia University, Sofia, Bulgaria
- Extensive and continuous work in education at international universities
- A course *Teaching Computer Science* taken at the Department of Computer Science, Indiana University, Bloomington, IN, U.S.; September 1999 – December 2000
- *International Teacher Training Course* at Uppsala University, Uppsala, Sweden (required for University Lecturers), March 27 – June 8 2006
- Publications on pedagogy

4 Employment and Association

4.1 Present

19 August 2019 – : Senior Assistant Professor in Mathematics
(by academic regulations in Bulgaria, including of IMI, BAS, it is as in June 29 1992, when awarded, by leaving abroad in June 1997), possibly approximating Associate Professor in Mathematics

Department of Algebra and Logic

Institute of Mathematics and Informatics (IMI)

Bulgarian Academy of Sciences (BAS)

Sofia, Bulgaria (<https://math.bas.bg/>) / (<https://math.bas.bg/?lang=en>)

October 1 2014 – : Guest Lecturer, Researcher,
from July 1 2018: Associated Researcher, without employment, without salary
Research group in Mathematical Logic
Department of Mathematics
Stockholm University, Stockholm, Sweden

4.2 Former Positions

October 23 1978 – December 15 1982: Specialist (Mathematics)

Computer Center of Ministry of Communications

Motherhood Leave: June 1979 – June 1982

December 20 1982 – August 1 1984: Specialist (Mathematics)

Computer Center of Institute of Agricultural Sciences, Sofia, Bulgaria

Work Assignment: handling mathematics and programming in information systems

August 1 1984 – August 1 1986: Mathematician

Laboratory of Mathematical Linguistics

Institute of Mathematics and Informatics, Bulgarian Academy of Sciences, Sofia, Bulgaria

United Center of Mathematics and Mechanics, joined institution between:

Institute of Mathematics and Informatics, Bulgarian Academy of Sciences

and Faculty of Mathematics and Informatics, Sofia University Sofia, Bulgaria

August 1 1986 – June 29 1992: Assistant Professor

Department of Mathematical Logic

Faculty of Mathematics and Informatics, Sofia University

Sofia, Bulgaria

June 29 1992 – July 2 2001: Senior Assistant Professor in Mathematics

(by academic regulations in Bulgaria, including of IMI, BAS, it is as in June 29 1992, when awarded, by leaving abroad in June 1997), possibly approximating Associate Professor in Mathematics

Department of Mathematical Logic and Applications

Faculty of Mathematics and Informatics, Sofia University, Sofia, Bulgaria

Work Assignment:

(1) teaching:

- Discrete Mathematics
- Logic — separate courses for students majoring in Mathematics and Computer Science
- Computability

- Foundations of Computer Science
- Formal Languages and Automata Theory
- Computational Linguistics
- Language Processing
- Computational Semantics

(2) research

August 2000 – December 2001: Visiting Assistant Professor approximately equiv. to Associate Professor

Department of Mathematics and Computer Science
Illinois Wesleyan University, Bloomington, IL, U.S.

Work Assignment: teaching courses in mathematics and computer science:

- Introduction to the WEB
- Computer Science
- Calculus I, Calculus II
- Finite Mathematics

February 1 2002 – May 31 2010: Universitetslektor i Datorlingvistik / Senior University Lecturer, i.e., Associate Professor in Computational Linguistics, Uppsala University
(closed for lack of students in the program of Computational Linguistics)

Assignment:

(1) 80% teaching courses in the areas of Computational Linguistics and related subjects, e.g:

- Foundations of Computer Science I
- Foundations of Computer Science II
- Computational Grammar I
- Computational Grammar II
- Computational Semantics
- Algorithms for Computational Semantics I
- Algorithms for Computational Semantics II
- Applied Automata Theory for Computational Linguists
- Algorithms and Data Structures in Object Oriented Programming
- Information Retrieval
- Research Seminar in Computational Linguistics
- Mathematical Linguistics
- Formal Syntax
- Introduction to Natural Language Processing for IT / Computer Scientists

(2) 20% research

June 1 2010 – September 30 2014: Independent Research, Uppsala, Sweden

October 1 2014 – June 30 2016; July 1 2016 – June 30 2017: Guest Lecturer and Forskare / Researcher

Department of Mathematics, Stockholm University, SE - 10691 Stockholm, Sweden

Activities / Assignments:

- (1) own research, participation in seminars, writing articles
- (2) certain teaching; e.g., series of lectures and seminars, Logics for Linguistics:
<http://staff.math.su.se/rloukanova/logling>
- (3) participation in research projects

July 1 2017 – June 30 2018: Forskare / Researcher

Department of Philosophy, Stockholm University, SE - 10691 Stockholm, Sweden

Activities / Assignments: own research, participation in seminars, writing articles, teaching supervision

4.3 Visiting Positions and Fellowships

November 1989 – April 1990: Visiting Researcher

Department of Mathematics, University of Oslo, Oslo, Norway

Work Assignment: Research in Computational Semantics

funded by a grant from the Norwegian Research Council for Science and Humanities in support of work on my Ph.D.

February – March 1994: Visiting Researcher

Center for Cognitive Science, Edinburgh, UK

Work Assignment: Research in Computational Semantics

funded by a grant under a Tempus project

February – May 1995: Visiting professorship

Department of Computer Science / Datalogisk Institut (DIKU), University of Copenhagen, Copenhagen, Denmark

Work Assignment: research and teaching in Computational Semantics

July 1997 – June 1998: Visiting professorship

Department of Mathematics, Indiana University, Bloomington, IN, U.S.

Work Assignment: teaching courses in Finite Mathematics and Mathematical Foundations of Cognitive Science

July 1998 – July 2000: Visiting while on sabbatical

Department of Computer Science, Indiana University, Bloomington, IN, U.S.

Work Assignment: teaching courses in Computer Science, e.g., Introduction to Computer Science (with programming), Discrete Mathematics, Theory of Computing, taking graduate courses in Computer Science

Spring Term 2000: Visiting Assistant Professor

Institute of Linguistics, University of Minnesota, Minneapolis, MN, U.S.

Work Assignment: teaching courses in

- Computational Linguistics
 - A-1 Computational Syntax
 - A-2 Computational Semantics (Logic; Methods of Logic for Computational Semantics)
- Topics in Computational Syntax and Semantics, with emphasis on Computational Semantics

August 2000 – December 2001: Visiting Assistant Professor

Department of Mathematics and Computer Science

Illinois Wesleyan University, Bloomington, IL, U.S.

Work Assignment: teaching courses in mathematics and computer science:

- Introduction to the WEB
- Computer Science

- Calculus I, Calculus II
- Finite Mathematics

May 2008: Visiting fellow

Department of English Linguistics, University of Göttingen, Germany

Work Assignment:

- research: Constraint-Based Grammar and Computational Semantics
- participation in the departmental research seminars
- weekly research meetings on Moschovakis Theory of Recursion
- teaching distantly, via Internet, a course at Uppsala University

September – December 2008: Visiting fellow

Tilburg Center for Logic and Philosophy of Science (TiLPS)

Tilburg University, Tilburg, The Netherlands

Work Assignment: research, while teaching at Uppsala University, via Internet

- Computational Semantics I (distance course)
- Applied Automata Theory for Computational Linguists (distance course)

December 2015 – January 2016: Guest Researcher

Department of Mathematics, Indiana University, Bloomington, IN, U.S.

December 2017: fellow of the Logic Group, Department of Mathematics, Stockholm University, Sweden, by CORCON grant, for research visiting at: Department of Mathematics and Statistics, University of Canterbury, Christchurch, New Zealand

March 2018: fellow of the Logic Group, Department of Mathematics, Stockholm University, Sweden, by a grant of the project: Computing with Infinite Data (CID) for research visiting at: School of Information Science, Japan Advanced Institute of Science and Technology (JAIST), Nomi, Japan

Part II

Scientific Expertise

5 Expertise

My expertise is on computational theories from the areas of Mathematical Logic, Theory of Computation, and their foundations of Computer Science and other computational sciences.

More specifically, my work has been in the following subjects:

- Type-Theoretic approaches to information theory and information processing
 - Dependent-Type Theory of Situated Information
 - Type-Theory of Algorithms
- Recursion Theory
- Computational Syntax — classic and new theories of formal and natural languages
- Automata Theory
- Computational Linguistics
- Computational Semantics of formal and natural languages
- Computational Syntax-Semantics Interfaces in formal and natural languages
- Partiality, underspecification, and dependency on situations, context, and agents, in information and languages
- Generalized Computational Grammar of Natural Language — covering lexicon and syntax-semantics interface
- Type-Theoretic Grammars
- Constraint-Based Lexicalized Grammar (CBLG) of Natural Language
- Bio-inspired Computational Theories of Information and Language — theory of computation, including classic and new theories of languages and automata
- A Type-Theoretic Approach to Computational Neuroscience of Information and Language — based on theory of computation, including classic and new theories of languages and automata
- Computational models of information and languages based on their biological phenomena
- Artificial Intelligence

Primarily, my research has been on theoretical developments of syntax-semantics interfaces in formal and natural languages, from the perspective of their nature. The theoretical development, on which I work, is based on existing practical syntax-semantics relations in programming languages and targets technology advancements.

The focus of my research is on computational models of *partiality, underspecification, and dependency on situations, context, and agents, in information and languages*.

I have been working along the following major lines:

- (1) New approach to the mathematical notion of algorithm: formalization of algorithms with recursion and iteration
- (2) New approach to Type-Theory of Situated Information: a computational approach to integration of declarative and procedural, dynamic computations, provided with memory for saving and updating partial, underspecified, situated, and agent dependent information
- (3) I have initiated work on integration of logic with quantitative mathematics, as theoretical foundation of Theory of Computation. The target of this integration advancement is applications to Data Science, Computational Linguistics, AI, Computational Neuroscience, advanced technology, etc.

Such work benefits development of new approaches to machine and deep learning.

Software and Programming: Alongside background and expertise in theoretical foundations, I have experiences with software packages, automatic proof systems, model checkers, verification techniques for programming, large scale computational grammars of human language (e.g., Stanford HPSG / LKB / The CSLI LinGO Project, TRALE, Chalmers GF).

I have tried and used varieties of programming and specification languages.

These experiences have been providing me with feedback for my work on theoretical developments.

6 Research Topics

Development of computational information theory is an open interdisciplinary area that has many applications, and usually requires integration of work on various topics. Such efforts have shaped my work on the following subjects:

Information Theory

- Type-Theory of Situated Information: work on new developments
- Type-Theory of Parametric, Situated Algorithms
- Semantics of natural and artificial languages
- Computational models based on biological phenomena of information and natural languages

Classical and Non-classical Logic: Type Theories

- Intensional Logic: IL and PTQ (e.g., approaches following Montague, 1970-73), TY_2 (approaches following Gallin, 1975)
- Dependent Type Theories (Martin-Löf, 1984 – now, Aczel, 2009 – now)
- Situation Theory (Barwise, 1980s)
- Higher-order Type-Theory of Recursion: I work on new developments of theory and applications

Algorithms and Computation

- Formal Languages, Grammars, and Automata
- Recursion Theory: generalized, higher-order typed recursion

Applications of Mathematical Logic and Theory of Computation

- Type Theory for modeling partiality, underspecification, situation dependency, and algorithms
- Typed Situation Theory and Situation Semantics
- Computational syntax, semantics, and syntax-semantics interfaces
 - Computation and formal languages: grammars, automata, parsing
 - Unification Grammars, Constraint-based Lexicalized Grammars: e.g., Definite Clause Grammars (DCG), Generalised Phrase Structure Grammar (GPSG), Head-Driven Phrase Structure Grammar (HPSG), Lexical Functional Grammar (LFG), Categorical Grammars (CG)
- Type-Theoretical Grammar with dependent types — formalization of constraint-based, lexicalized grammars (HPSG, LFG, GF, etc.) with types with constraints
 - formalization of common ideas of constraint-based, lexicalized grammars (HPSG, LFG, GF, etc.)
 - applications to natural languages
- Computational Syntax-Semantics Interfaces formalization of interdependency between syntax and semantics

- Development of generalized computational grammar based on dependent types and syntax-semantics interfaces

Bio-inspired Type-Theory of Information

- Computational models of information and languages
- Bio-inspired computational grammar with syntax-semantics interface: computational models of information and languages in nature
- Computational neuroscience of information and language
- Development of systems of computing and semantic processing based on natural phenomena of information and language
- New approaches to technologies for processing partial and underspecified information
- Dynamic syntax-semantics interfaces

Part III

Software

7 Experience with Software Packages

- Theorem Provers, e.g., the automated proof checking system MIZAR; the PVS Specification and Verification System (SRI Int.) — a specification language integrated with support tools and a theorem prover
- Model Checkers: e.g., SMV System
- Large scale grammars of human languages, e.g.:
 - LKB / The CSLI LinGO Project at:
Stanford University, Center for the Study of Language and Information (CSLI)
(<https://www-csli.stanford.edu/groups/lingo-project>)
I have extensive experience with it
 - *TRALE* (<https://hpsg.fu-berlin.de/Software/>) (brief familiarity) a grammar development system for Head-Driven Phrase Structure (HPSG)
 - Chalmers *GF, Gramatical Framework* (<https://www.grammaticalframework.org/>) as a part of my research and course projects on foundations of generalized CBLG and type-theoretic grammar of human languages
- Software and courseware packages:
 - *Language, Proof and Logic: Tarski's World, Fitch, Boole*, (LPL)
by Dave Barker-Plummer, Jon Barwise, and John Etchemendy
(<https://www.gradgrinder.net>)
at CSLI Publications, Stanford:
(<https://web.stanford.edu/group/cslipublications/cslipublications/site/9781575866321.shtml>)
 - Logical Reasoning with Diagrams and Sentences (LRDS),
by Dave Barker-Plummer, Jon Barwise, and John Etchemendy
and the advanced natural deduction software Hyperproof
(<https://www.gradgrinder.net/Products/lrds-index.html>)
 - Formal Grammars and Automata Software packages, e.g.:
 - * *Turing's World*. Dave Barker-Plummer, Jon Barwise, and John Etchemendy
I have extensive experience with it
 - * *JFLAP: An Interactive Formal Languages and Automata Package*
(<https://www2.cs.duke.edu/csed/jflap/>)
I have extensive experience with it
 - * Finite State Technology of XEROX

Part IV

Pedagogic Profile

Upon request, I can provide documents referred to in the following sections.

8 Experience in Teaching

My major expertise in teaching is in:

- *Mathematical Logic*
- *Discrete Mathematics*
- *Theory of Computability and Theory of Computation*
- *Theory of Formal Languages and Automata Theory*
- *Recursion Theory*
- *Mathematical Foundations of:*
Computational Linguistics, Natural Language Processing, Computer Science
- *Applications of Logic to:*
Computational Linguistics, Natural Language Processing, Computer Science
- *Natural Language Processing*
- *Mathematical Methods in Computational Linguistics*
- *Computational Syntax*
- *Computational Semantics*
- *Computational Syntax, Semantics, and Syntax-Semantics Interfaces*
- *Computational Syntax-Semantics Interfaces*
- *Natural Language Processing in Artificial Intelligence*
- *Mathematical Foundations of Cognitive Science*

8.1 Courses Taught and Developed

- *Theory of Computability*
- *Theory of Formal Languages and Automata Theory*
- *Applied Automata Theory*
- *Mathematical Foundations of Computer Science*
- *Mathematical Logic*
- *Logical Methods in Linguistics*
- *Formal and Computational Syntax and Semantics*
- *Discrete Mathematics*
- *Finite Mathematics*
- *Situation Theory and Situation Semantics*
- *Mathematics and Logic for Cognitive Science*
- *Computational Linguistics*
- *Topics in Syntax and Semantics*
- *Introduction to Computer Science*
- *Introduction to the WEB*
- *Calculus I, II*
- *Information Retrieval*
- *Algorithms and Data Structures*
- *Programming Languages*
- *Logic*
- *Mathematical Linguistics*
- *Natural Language Processing for Computer Science Students*

- *Formal Syntax*
- *Computational Grammar*
- *Computational Syntax and Parsing Algorithms*
- *Computational Semantics*
- *Logics for Linguistics*, a series of lectures and seminars (co-organiser and lecturer):
<https://staff.math.su.se/rloukanova/logling>

8.2 Guest-teaching Abroad

I have extensive experience in teaching and courses development in Mathematics, Computer Science, and Computational Linguistics, for international programs:

February – May 1995: Visiting professorship

Datalogisk Institut (DIKU), Kopenhagen University, Kopenhagen, Denmark

Work Assignment: research and teaching in Computational Semantics

July 1997 – June 1998: Visiting professorship

Department of Mathematics, Indiana University, Bloomington, IN, U.S.

Work Assignment: teaching courses in Finite Mathematics and Mathematical Foundations of Cognitive Science

July 1998 – July 2000: Visiting while on sabbatical

Department of Computer Science, Indiana University, Bloomington, IN, U.S.

Work Assignment: teaching courses in Computer Science, e.g., Introduction to Computer Science (with programming), Discrete Mathematics, Theory of Computing, taking graduate courses in Computer Science

Spring Term 2000: Visiting Assistant Professor

Institute of Linguistics, University of Minnesota, Minneapolis, MN, U.S.

Work Assignment: teaching courses in

- Computational Linguistics
 - A-1 Computational Syntax
 - A-2 Computational Semantics (Logic; Methods of Logic for Computational Semantics)
- Topics in Computational Syntax and Semantics, with emphasis on Computational Semantics

August 2000 – December 2001: Visiting Assistant Professor (approximately equiv. to Associate Professor)

Department of Mathematics and Computer Science

Illinois Wesleyan University, Bloomington, IL, U.S.

Work Assignment: teaching courses in mathematics and computer science:

- Introduction to the WEB
- Computer Science
- Calculus I, Calculus II
- Finite Mathematics

May 2008: Visiting fellow

Department of English Linguistics, University of Göttingen, Germany

Along with my research, I was teaching distantly, via Internet, a course at Uppsala University

September – December 2008: Visiting fellow

Tilburg Center for Logic and Philosophy of Science (TiLPS)
Tilburg University, Tilburg, The Netherlands

Work Assignment: research, while teaching at Uppsala University, via Internet

- Computational Semantics I (distance course)
- Applied Automata Theory for Computational Linguists (distance course)

All courses that I taught on formal and computational grammar, syntax, and semantics have been developed and delivered by myself: lectures, computer labs, course assignments, and projects.

Teaching at Sofia University, Bulgaria, 1984 – 1997: During my work at the Faculty of Mathematics and Informatics, Sofia University, Sofia, Bulgaria, between August 1 1984 and June 30 1997, I regularly taught the following courses:

- Discrete Mathematics
- Logic — separate courses for students majoring in Mathematics and Computer Science
- Computability
- Foundations of Computer Science
- Formal Languages and Automata Theory
- Computational Linguistics
- Language Processing
- Computational Semantics

During that period, except for the times of leaves, I taught at least two courses every term. For the courses in Discrete Mathematics, Logic, Computability, and Foundations of Computer Science, I took part in the major course lectures, by following instructions from the professors that were responsible for the subjects. Primary, was responsible, on regular basis, for the practical teaching of 3-6 groups per course. Each group had about 15 students. The course lessons, for each group, were 4 hours per week (two lesson sessions per week) running during regular teaching terms of 14-15 weeks. The examinations consisted of weekly written-homework assignments (hand-ins), and two written, closed-book, exams per course. I prepared the lessons, the homework assignments, the exams, and the re-exams by myself. I did all the grading by myself. Passing these written exams was prerequisite for access to the major written and oral final examination of the course. I took part as one of the examiners, for each course, in the final oral examinations and the grading.

During that period, I developed specialized courses for students in the Master of Science program, e.g., courses in Computational Linguistics, Language Processing, and Computational Semantics. The curricula, the course materials, the lectures, and the examinations in these courses were prepared and done by myself.

Regularly, I took part in the entrance examinations for Sofia University, and in the final, graduate exams for the Bachelor and Master's programs in Mathematics and Computer Science.

Teaching at the Department of Mathematics, Indiana University, Bloomington, IN, U.S., 1997–1998: I taught the courses

- Finite Mathematics
- Mathematics and Logic for Cognitive Science

During the terms of 1997-98 school year, I taught a course *Finite Mathematics*, which is one of the courses provided by the department for students majoring in different subjects. The classes consisted of 60-100 students. I prepared the lectures, homework assignments, and the examinations by following the standard curriculum and course materials established at the department.

Together with Jon Barwise, we developed the first offerings of the course *Mathematics and Logic for Cognitive Science*, in 1998. We used the following courseware books with software packages

- *Turing's World*. Dave Barker-Plummer, Jon Barwise, and John Etchemendy
- *Language, Proof and Logic: Tarski's World, Fitch, Boole*. Dave Barker-Plummer, Jon Barwise, and John Etchemendy
(<https://www.gradgrinder.net>)

The course consisted of lectures and computer labs. We assigned reading course materials, i.e., chapters from the course materials, in advance of the lectures on the topics. Instead of traditional lecturing, we used the lecture times for discussions on topics led by questions from students.

Teaching at the Department of Computer Science, Indiana University, Bloomington, IN, U.S., 1998–1999: During the terms of 1998-99 school year, I was an instructor in the standard courses established at the department: Introduction to Computer Science, Discrete Mathematics, and Theory of Computing. The teaching consisted of 4 hours lectures and 4 hours practical tutoring, typically in 14 weeks terms. I was responsible for the practical tutorials and followed the recommendations of the senior lecturers in charge of the courses. I gave the homework assignments, and did the grading, including of final examinations.

Teaching at the Linguistics Program, University of Minnesota, Minneapolis, U.S.: I taught the following courses:

- Computational Linguistics
The course was concentrated on contemporary approaches for grammar development, and consisted of two parts, computational syntax and semantics of natural languages, respectively:
A-1 Computational Syntax
A-2 Computational Semantics
 - (a) Logic
 - (b) Methods of Formal Logic for Computational Semantics

The lectures on syntax presented the constrained-based, lexicalist approaches to grammar theory and the formal tools of feature-valued structures and unification. The part on semantics was an introduction to logic and formal logic methods. I used computer lab with the courseware Language, Proof, and Logic (LPL). In the course, I used three textbooks:

1. Sag I. A. and T. Wasow. 1999. *Syntactic Theory. A formal Introduction*. CSLI Lecture Notes. N. 92. Stanford: CSLI Publications.
2. De Swart, H. 1998. *Introduction to Natural Language semantics*. Stanford: CSLI Publications.
3. *Language, Proof and Logic: Tarski's World, Fitch, Boole*. Dave Barker-Plummer, Jon Barwise, and John Etchemendy
(<https://www.gradgrinder.net>)

- Topics in Computational Syntax and Semantics, with emphasis on Computational Semantics

The curricula, the course materials, the lectures, the computer labs, and the examinations in these courses were prepared and done by myself.

The seminar *Topics in Computational Syntax and Semantics* was for advanced graduate, post-graduate students, and researchers, with about 10 participants. I prepared and presented the lectures.

Teaching at the Department of Mathematics and Computer Science, Illinois Wesleyan University, Bloomington, IL, U.S.:

- Introduction to Computer Science
- Calculus I
- Calculus II

- Finite Mathematics

For the courses *Introduction to Computer Science*, *Calculus I*, and *Calculus II*, I prepared the lectures, homework assignments, and the examinations (two mid-term exams, a final exam, and re-exams) by following the standard curricula and course materials established at the department. I had the possibility to follow my own teaching methods, but I also followed advises from colleagues who were experienced in the courses. In the courses *Calculus I* and *Calculus II*, I lectured by following students' questions on reading assignments prior to lecture. In the times for practice on problems, I formed small working groups of 2-3 students, and interactively, I joined their work on problems.

I developed the course *Finite Mathematics* by myself following advises from the head of the department. I prepared course materials, lectures, written-homework assignments, two mid-terms, a final exam, and re-exams, by myself.

Teaching at Uppsala University, Sweden: Between February 2002 – May 2010, I was employed as University lecturer in Computational Linguistics, at the Department of Linguistics and Philology. Uppsala University, Uppsala, Sweden.

I taught courses in the areas of Computational Linguistics and related subjects. I was responsible for the administration, kursansvarig, of the courses. I developed and delivered lectures and computer labs by myself, and maintained the course websites.

- Foundations of Computer Science I
- Foundations of Computer Science II
- Computational Grammar I
- Computational Grammar II
- Computational Semantics
- Algorithms for Computational Semantics I
- Algorithms for Computational Semantics II
- Applied Automata Theory for Computational Linguists
- Algorithms and Data Structures in Object Oriented Programming
- Information Retrieval
- Mathematical Linguistics
- Formal Syntax
- Introduction to Natural Language Processing for IT / Computer Scientists

The curricula, the course materials, the lectures, the computer labs, and the examinations (with few exceptions of help grading of homework assignments, by assistants) in these courses were prepared and done by myself. I gave written-homework assignments (hand-ins), one per topic, usually one per week. The examinations usually consisted of a written mid-terms and a final examination. In the more advanced course, Algorithms for Computational Semantics II, examination involved a course projects. Students could work on their homework assignments in groups of two students, but I required that every student had individual submission, including a report on the details of collaboration. For the parts on Logic of the course *Foundations of Computer Science*, and partly in the course *Computational Semantics*, I used the Computerised Package *Language, Proof, and Logic*, including all of its software, for homework assignments and examinations. For the course *Applied Automata Theory for Computational Linguists*, I used *JFLAP: An Interactive Formal Languages and Automata Package* (<https://www2.cs.duke.edu/csed/jflap/>)

In addition to the help for the software packages, I used to provide help instructions for their study and completing assignments. I provided help during computer labs, office hours, and under requests from students, sometimes via Internet. After grading, depending on the occasions as appropriate, I requested students to re-submit corrected or improved assignments, by following suggestions and hints given by me on their works. By my experience, this helps their learning with understanding.

For the courses *Formal Syntax*, *Computational Grammar I*, and *Computational Grammar II*, I

developed course lectures, course labs, homework assignments, and examinations by myself. For the computer assignments, I used the grammar tool LKB (<https://www-csli.stanford.edu/groups/lingo-project>).

8.3 Distance Teaching

I have experience in teaching distance courses by classic methods (in written correspondence) and over the Internet, including by using computerized courseware.

1. *Foundations of Computer Science* (Combining class-room settings and on-line teaching)
Between 1999-2001 I taught this subject as a distance course given by Indiana University, Bloomington, US, for students living in different locations, including abroad. While the method of teaching was based on distant learning, written homework assignments, written midterms, and final examinations, I used a method developed by myself, by following general recommendations for the curriculum. In particular, I gave specialized selections of assignments and provided students with feedback, by prompted them to work on better solutions. Supervision included weekly instruction and consultations over telephone. Such supervision required vigilance and alertness from the teacher, according to my experience.
2. *Formal and Computational Grammar*, combining class-room settings and on-line teaching: Department of Linguistics and Philology, Uppsala University, Uppsala, Sweden
The curricula, the lectures, and the examinations in these courses were prepared and done by myself.
3. *Applied Automata Theory for Computational Linguists*, combining class-room settings and on-line teaching: Department of Linguistics and Philology, Uppsala University, Uppsala, Sweden
After several years of teaching by combining class-room and on-line methods, the course was developed as fully distance teaching, via the Internet, in 2008. An important ingredient of the on-line teaching is using software packages, such as LPL, grammar and automata software.
4. *Computational Semantics*, combining class-room and on-line teaching: Department of Linguistics and Philology, Uppsala University, Uppsala, Sweden
The curricula, the lectures, and the examinations in these courses were prepared and done by myself. This is a major topic of my teaching and research work. It is open for curriculum, course material and software development.
5. *Information Retrieval*: Department of Linguistics and Philology, Uppsala University, Uppsala, Sweden
In 2003, Spring term, I organised participation of Uppsala University in a virtual course on Information Retrieval, developed by an educational project with EU funding, at München, Tilburg, and Tübingen, hosted by Tübingen, Germany. I organised a group of students at Uppsala University for the course, applied for and obtained financing of the course by an EU project in Germany. I proctored and helped the students from Uppsala on their course assignments, study and handling the on-line material, and their work on final course papers and the final examination presentations. The students presented their final course projects at a conference in Tübingen, Germany (May 2003), for which I applied for and received funding from the German EU course project for the Uppsala University students, including support of a student for the travel of her baby and baby-care.

8.4 Experience with Software Packages in Courses

- Theorem Provers, e.g., the automated proof checking system MIZAR; the PVS Specification and Verification System (SRI Int.) — a specification language integrated with support tools and a theorem prover
- Model Checkers: e.g., SMV System
- Large scale grammars of human languages, e.g.

- LKB / The CSLI LinGO Project at:
Stanford University, Center for the Study of Language and Information (CSLI)
(<https://www-csli.stanford.edu/groups/lingo-project>)
I have extensive experience with it
- *TRALE* (<http://hpsg.fu-berlin.de/Software/>) (brief familiarity) a grammar development system for Head-Driven Phrase Structure (HPSG)
- Chalmers *GF*, *Gramatical Framework* (<http://www.grammaticalframework.org/>) as a part of my research and course projects on foundations of generalized CBLG and type-theoretic grammar of human languages
- Software and courseware packages, e.g.:
 - *Turing's World 3: An Introduction to Computability Theory*. Dave Barker-Plummer, Jon Barwise, and John Etchemendy
I have extensive experience with it
 - *Language, Proof and Logic: Tarski's World, Fitch, Boole*. Dave Barker-Plummer, Jon Barwise, and John Etchemendy
(<https://www.gradegrinder.net>)
I have extensive experience with it
 - Formal Grammars and Automata Software packages, e.g.:
 - * *Turing's World*: I have extensive experience with it
 - * *JFLAP: An Interactive Formal Languages and Automata Package*
(<https://www2.cs.duke.edu/csed/jflap/>)
I have extensive experience with it
 - * Finite State Technology of XEROX

9 Experience as a Supervisor

9.1 Supervision of Bachelor and Master's Theses

- Over years of teaching, I have supervised many course projects at basic, intermediate, and advanced levels (it's impossible for me to count them now).
- At the Faculty of Mathematics and Informatics, Sofia University, I taught upper level, specialized courses for theses. I supervised Master's (M.Sc.) theses in informatics and computational linguistics. E.g., a student completed his M.Sc. thesis on implementation of the situation semantics analysis developed in my Ph.D. dissertation.
- Supervisor of Bachelor of Science (BSc) thesis in Mathematics, Department of Mathematics, Stockholm University, Sweden
Title: *Montague's Intensional Logic for Computational Semantics of Human Language*. Student: Axel Ljungström, 2018:K16¹
<https://www.math.su.se/publikationer/uppsatsarkiv/tidigare-examensarbeten-i-matematik/kandidatarbeten-matematik-2018-1.371073>

9.2 Supervision of Ph.D. Students

At Sofia University, where I was on a full-time faculty post, a Ph.D. student developed a Prolog system, as a part of the Ph.D. dissertation, on education in mathematics for children, which used

¹Copy-paste long URL addresses may add some empty space at the point of line breaks, which has to be removed in the URL address slot of a browser.

situational structures, similar to the ones in my Ph.D. dissertation. I was an additional adviser for the development of the system.

In the Autumn 2014, I supervised PhD students of the Department of Mathematics, Stockholm University, on their project work on the Chalmers GF, Gramatical Framework (<http://www.grammaticalframework.org>).

9.3 Work as a Supervisor — Approach

I familiarize myself with the educational background of the students. In meetings with students, we discuss their interests for topics, their preferences for work on theses, and directions they may pursue in education, profession, and future careers. We choose the subjects, topics, the titles, the tasks, and make plans for work. We set initial bibliographical references, by keeping the lists open for extending, and schedules for work and meetings.

9.4 Participation in Evaluation Committees of M.Sc. and Ph.D. Theses

- During my work at Sofia University, Bulgaria, I served many times as a reviewer of M.Sc. theses and Ph.D. dissertations of students specializing in mathematical logic, computational linguistics, and computer science.
- Twice as an opponent and member of examination committees of Ph.D. theses (betygsnämnd i Ph.D. disputation) at the Department of Information Technology, Uppsala University, Sweden. For example, in the Ph.D. disputation of Lisa Kaati. (She was hired as a researcher in Totalförsvarets forskningsinstitut (FOI), for her dissertation on automata theory.)
- an opponent and member of the examination committee of the Ph.D. theses, at School of Computer Science and Communication (CSC), at KTH Royal Institute of Technology in Stockholm
 - (1) Marc Vinyals, the title of the thesis: “Space in Proof Complexity” (9 June 2017)
 - (2) Susanna F. de Rezende, the title of the thesis: “Lower Bounds and Trade-offs in Proof Complexity” (14 June 2019)
 (<http://kth.diva-portal.org/smash/record.jsf?pid=diva2%3A1318061&dswid=7905>)

10 Training in Teaching and Learning in Higher Education

- By continuous work in the educational system of the Faculty of Mathematics and Informatics, Sofia University, Sofia, Bulgaria
- By extensive and continuous teaching work at international universities
- A course *Teaching Computer Science* taken at the Department of Computer Science, Indiana University, Bloomington, IN, US; September 1999 - December 2000
- *International Teacher Training Course* at Uppsala University, Uppsala, Sweden (required for University Lecturers), March 27 – June 8 2006. The certificate is enclosed
- Publications on pedagogy
 - *Teaching with the Computerised Package Language, Proof, and Logic (LPL)*. In: Boute, R and J.N. Oliveira (Eds.). *Formal Methods in the Teaching Lab*. Formal Methods 2006 Symposium McMaster University, Ontario, Canada. Workshop Preprints. pp. 101–110. (<http://www.di.uminho.pt/FME-SoE/FMEd06/Preprints.pdf>)
 - *Teaching Formal Methods for Computational Linguistics at Uppsala University*. In: Boca, J.P. Bowen, D.A. Duce (Eds.). *Teaching Formal Methods: Practice and Experience*. Oxford Brookes University and BCS-FACS. Proceedings, pp. 57–62. 15 Dec 2006.

11 Course Development and Course Administration

11.1 Plans Related to Pedagogic Work

For some publications on pedagogic and teaching materials, see the List of my Publications.

Interdisciplinary Educational Program I have been working on plans for development of an interdisciplinary educational program in *Computational Sciences, with specialisation in Computational Linguistics*, for Bachelor, Master, and Ph.D. (doctoral) degrees. Upon request, I can provide the draft of the program.

Teaching

- Teaching at all levels of undergraduate, graduate, and postgraduate programs
- Development of courses on specialized topics and in interdisciplinary areas
- Seminars for researchers working in interdisciplinary areas

11.2 Course Administration and Management

I prepare course curricula, descriptions, assignments, and examinations. I deliver courses and maintain their websites with relevant information. I keep up Internet communications with students for the courses, by agreeing on course regulations and ethics, with colleagues and students.

I was responsible for the administration of the courses taught by me, e.g., at Uppsala University. I developed and delivered lectures and computer labs by myself, and maintained the course websites.

Collaboration within the Education Programme For smooth work on teaching within the education program, it is necessary to coordinate all relevant aspects, e.g.:

- existing courses
- introduction of new courses or subjects in courses and supervision
- teaching in general and in particular subjects
- course dependencies, where material in some courses is dependent on prior knowledge, e.g., in existing or by introduction of new topics
- new tendencies in research, which are important to be reflected in education program
- collaboration on teaching between courses within the department, departments within the institution, local universities, and upward at national and international stage and levels
- collaboration between academic, industrial, and other commerce institutions
- continuous reflection, with updates, of strategically important areas on education program
- development of new education programs

12 Other Activities Related to Teaching

Pedagogical Activities outside the University I participated in the educational program in Mathematical Linguistics for high school students, for the Bulgarian National Olympic Competitions. The program was organized and sponsored by the Ministry of Sciences and High Education, Bulgaria. I taught in the summer schools of the program, and the Ministry published my teaching materials.

13 Reflections on my own Teaching Work

13.1 Teaching Methods in the Context of Technology

My ideas about teaching are expressed to certain extent in my papers on pedagogy. Combination of different techniques and technologies, esp. by using computerized packages, in teaching, course assignments, and grading, is essential for learning and understanding course material, in general. Course materials, lectures, and supervision, when supported with computerized systems, at all levels, enhance comprehension of theoretical backgrounds such as mathematical foundations of computer sciences, computational models of information and information exchange, theories of algorithms, implementation dependencies, constraints, variations, etc.

The level of presentation and course materials should be consistent with the level of the course. For example, formal systems and theories, when they are background to the major course material, may be given at the level of supporting ideas and intuitions, in a pertinent style. On the other side, when relevant, theory should be presented in a more comprehensive style, e.g., with formal proofs, in a mathematical style. Assignments and demonstrations with software provide engagement, learning feedback and enhancement.

Computerized teaching is an excellent way to prepare students for the contemporary professional environments with growing technologies. It provides students with problem solving skills, creativity, and abilities for efficiency in work. Importantly, they get trained for attainments in computer-user interactions with new technologies (incl. in new, challenging, unpredictable environments), as non-professional and professional users, e.g., future scientists, developers in technological areas, and other professionals. In particular, computerized course materials provide students with:

- practical experience with subject topics
- skills for real life tasks
- specialized professional skills in technologies
- background and knowledge for academic careers and scientific research

Computerized courseware packages provide possibilities for far more course assignments than in traditional teaching. Students have the possibility to improve their solutions of tasks and they readily take that up, which promotes learning and understanding of the material. On-line work by advanced software and automatic checking of solutions, gives the students enhanced and flexible possibilities for individual work, provides them with learning feedback for self-evaluation of progress, in proper and fair style. Computerized courseware facilitates the education, primarily from the perspective of students, as learners. From the side of the lecturer, computerized teaching provides valuable feedback on the course work by students, their learning progress and knowledge achievement, in a far more comprehensive way than traditional teaching.

13.2 Reflection on Pedagogy and Teaching

I have extensive experience with students who worked on course assignments and projects, in groups or individually. I have used various methods, many forms of advise and help based on individual cases, in classes, in office hours, and on-line.

That experience has taught me to respect students with divergent background, and different standing, and to provide directions, advise, help, and encouragement as needed.

Teaching work in all forms (in-class lecturing, computer labs, on-line course work, discussions with students, in groups and individually, in class and open-office) has given me invaluable feedback.

For some publications on pedagogic and teaching materials, see the List of my Publications.

Part V

Grants, Projects

Research funds: Predominantly, since 2009, up to September 30, 2014, I maintained my research work as an Independent Researcher. From 1 October 01, 2014 to May 2018, my research was supported by the Department of Mathematics and by the Department of Philosophy, Stockholm University, Sweden.

11 October 2021 – 10 October 2025 Project: COST Action

European Research Network on Formal Proofs (EuroProofNet) CA20111

<https://www.cost.eu/actions/CA20111/>

<https://europroofnet.github.io>

The main proposer is Frédéric Blanqui. I'm a secondary proposer, together with colleagues from other countries. I'm happily proud that I am:

- elected as a member of the Management Committee (MC) of EuroProofNet
- elected as the vice-leader of WG6: Type theory, work group of EuroProofNet
- assigned in the following Working Groups (WGs) of EuroProofNet:
 - WG1: Tools for proof systems interoperability
 - WG2: Automated theorem provers
 - WG3: Program verification
 - WG6: Type theory

In the Past:

- 1986 – 1991: Grant by an exchange program between Bulgarian Ministry of Education and Moscow State University (MGU), Moscow, USSR, for Ph.D. program in Mathematics: 1986 – 1991 at: Department of Discrete Mathematics, Faculty of Mechanics and Mathematics, Moscow State University (MGU), Moscow, USSR — current Russia
- Over the years at Sofia University, participation in research projects in the areas of logic, computability, and computational linguistics, by research contracts between the Bulgarian Ministry of Sciences and Higher Education, The Institute of Mathematics and Informatics of Bulgarian Academy of Sciences, and the Department of Mathematical Logic, Faculty of Mathematics and Informatics, Sofia University
- Research on Computational Semantics as part of my PhD research program, supported by a grant from the Norwegian Research Council for Science and Humanities, Oct 1989 – Apr 1990
- A Tempus grant for a project on Computational Semantics, 1994
- A travel grant from Vetenskapsrådet, Swedish Research Council, NT, Sweden, for participation in *Theoretical Aspects of Computing — ICTAC 2007*
- partial grant towards travel and accommodation expenses from:
 - University of Göttingen, Germany
 - Visiting research fellow at the Department of English Linguistics, May 2008
 - The result was a research paper on syntax-semantics interface in CBLG by using the language of acyclic recursion.
- partial grant towards travel and accommodation expenses from:
 - Tilburg Center for Logic and Philosophy of Science (TiLPS), Tilburg University
 - Visiting research fellow at TiLPS, Sep – Dec 2008
 - The result was a publication and participation in a conference — ForLing 2008 — and work on research project on Computational Semantics for natural and artificial languages. In parallel, I taught and conducted work on distance teaching on formal methods and theoretical foundations of computer science.

- Grant towards travel expenses for participation in AAIA'15: 6636 SEK 48 öre from: Department of Mathematics, Stockholm University, Stockholm, Sweden towards expenses for participation at:
10th International Symposium Advances in Artificial Intelligence and Applications (AAIA'15) Lodz, Poland, 13-17 Sep 2015 (<https://fedcsis.org/2015/aaia.html>)
- Grant towards travel expenses for participation in AAIA'17: 8042 SEK 21 öre from: Department of Philosophy, Stockholm University, Stockholm, Sweden towards expenses for participation at:
International Symposium Advances in Artificial Intelligence and Applications (AAIA'17), Prague, Czech Republic, 3 – 6 September, 2017 (<https://fedcsis.org/2017/aaia>)
- Grant towards travel expenses for participation in AAIA'18 / AIRIM'18
3rd International Workshop on AI aspects of Reasoning, Information, and Memory (AIRIM'18) Poznań, Poland, 9 - 12 September, 2018 (<https://fedcsis.org/2018/airim>)
granted:
 - (1) by FedCSIS: registration fee waiver, for chairing AIRIM'18 (550 euros)
 - (2) by the Adam Mickiewicz University:
 - accommodation
 - daily food coverage: 200 Polish Zloty (equivalent to approx 500 SEK)
 - local transport in Poznań
- Grants towards travel expenses for participation in the International Conference on Agents and Artificial Intelligence, ICAART (<https://icaart.scitevents.org>):
 - (1) 3 x 595 = 1785 euro
from: INSTICC (<https://portal.insticc.org>)
grants equivalent to waiving regular participation fees for ICAART 2015, ICAART 2018, ICAART 2019
 - (2) 6228 SEK 93 öre (approximately 623 euro)
towards travel expenses for participation in ICAART 2015
from: Department of Mathematics, Stockholm University, Stockholm, Sweden
 - (3) 6812 SEK 47 öre
towards travel expenses for participation in ICAART 2018:
from: Department of Philosophy, Stockholm University, Stockholm, Sweden
- 71 000 SEK
from: Vetenskapsrådet (<https://www.vr.se>) konferensbidrag
Diarienummer: 2017-00571 Project title: Workshop om logik och algoritmer i datorlingvistik 2017 (LACompLing17)
Project leader: Roussanka Loukanova Date of the award: 2017-06-13
- Grants towards travel expenses for participation in:
Symposium *Possible Worlds: Problems and Prospects* at the Ninth European Congress of Analytic Philosophy (ECAP9), 21-26 August 2017, Munich
 - (1) 600 euro (6091 SEK 63 öre)
from: Ludwig-Maximilians-Universität (LMU) München
 - (2) 2635 SEK 1 öre (approximately 263 euro)
from: Department of Philosophy, Stockholm University, Stockholm, Sweden
- 2000 euro
fellow of the Logic Group, Department of Mathematics, Stockholm University, Sweden
a grant on the project CORCON
towards expenses for research visiting, December 2017, at:
Department of Mathematics and Statistics, University of Canterbury, Christchurch, New Zealand
- 2000 euro
fellow of the Logic Group, Department of Mathematics, Stockholm University, Sweden

a grant on the project:
Computing with Infinite Data (CID)
towards expenses for research visiting, March 2018, at:
School of Information Science, Japan Advanced Institute of Science and Technology (JAIST),
Nomi, Japan
(<https://www.jaist.ac.jp/is/labs/ishihara-lab/www/english/index.html>)

INGRACOMLEN: Project, 2016 – 2018

Project Title: Algoritmos de inferencia gramatical para medir la complejidad relativa de las lenguas naturales (Grammatical Inference Algorithms for measuring the relative complexity of natural languages) INGRACOMLEN

Financial Entity: Ministerio de Economía y Competitividad, Spain

Duration: From 01/01/2016 to 31/12/2018

Participant Universities: Universitat Rovira i Virgili, Jean Monnet University, Roskilde University, Stockholm University

Number of Researchers: 8

Scientist in Charge: M. Dolores Jiménez López

URL: <https://ingracomlen.wordpress.com>

Funding: 28400 euro, designated for project meetings and conferences

Funding to me, for my participation:

- paid flights, hotel, buses, taxi (between Uppsala and Arlanda Airport, Stockholm) towards expenses for a project meeting at:
Universitat Rovira i Virgili, Tarragona, Spain, 26-29 November 2016
- paid flights, hotel, registration fees of two full papers towards expenses for participation and presentation at:
15th International Conference on Distributed Computing and Artificial Intelligence (<https://www.dcai-conference.net>)
- paid flights, hotel; reimbursed 90 euro 95 cents: for buses, taxi (between shuttle-bus stops and residence, accommodation), towards expenses for a project meeting at:
Universitat Rovira i Virgili, Tarragona, Spain, 17-19 December 2018

Education Grants

- 2003, Spring term: Grant by Tübingen Linguistics Department, Germany, for participation as a lecturer, together with six students from Computational Linguistics at Uppsala University, in a virtual course on Information Retrieval, developed by an educational project with EU funding, at München, Tilburg, and Tübingen, hosted by Tübingen, Germany. The grant included full travel expenses for the students and me, for participation in a course conference at Tübingen Linguistics Department, Germany.

Part VI

Scholarly Activities

14 Scientific Organizations, Committees

14.1 Organization Committees, Chair

- A general co-chair of the federated conferences of Mathematical Linguistics (MALIN) 2021, Montpellier, 13–17 December 2021
- The founder and a chair of the series of the Symposium *Logic and Algorithms in Computational Linguistics* (LACompLing):
 - Symposium *Logic and Algorithms in Computational Linguistics* 2021 (LACompLing2021): part of a week on *Mathematical Linguistics* (MALIN) 2021, Montpellier, 13–17 December 2021, online streaming by Université de Montpellier
(<https://staff.math.su.se/rloukanova/LACompLing2021-web/>)
 - Symposium *Logic and Algorithms in Computational Linguistics* 2018 (LACompLing2018), Stockholm, 28–31 August 2018, Departments of Mathematics and Philosophy, Stockholm University
(<https://staff.math.su.se/rloukanova/LACompLing2018-web/>)
 - Workshop on *Logic and Algorithms in Computational Linguistics* 2017 (LACompLing17), Stockholm, August 26, 2017, Department of Mathematics, Stockholm University
(<https://staff.math.su.se/rloukanova/LACompLing17.html>)
- The founder, chair, and organizer, together with Sara Rodríguez, University of Salamanca, Spain
Special Session on Computational Linguistics, Information, Reasoning, and AI (CLIRAI) / (CompLingInfoReasAI)
(<https://www.dcai-conference.net/special-sessions/clirai>)
at the International Conference on Distributed Computing and Artificial Intelligence, DCAI
 - CLIRAI'23 at DCAI'23 Guimarães, Portugal, 12–14 July 2023
(<https://www.dcai-conference.net/special-sessions/clirai>)
 - CompLingInfoReasAI'22 at DCAI'22, L'Aquila (Italy) - Hybrid, within PAAMS'22, 13–15 July, 2022
 - CompLingInfoReasAI'21 at DCAI'21, Salamanca, Spain, within PAAMS'21, 6th–8th October, 2021. Charing the presentation session of CompLingInfoReasAI'21 at DCAI'21.
- The founder, organiser, and chair of:
 - Special Session on Natural Language Processing in Artificial Intelligence - NLPinAI, within the International Conference on Agents and Artificial Intelligence - ICAART
 - NLPinAI is a continuation of the series PUaNLP 2015–2017 at ICAART.
 - NLPinAI 2023 within ICAART 2023, 22–24 February 2023 — Lisbon, Portugal
(<https://icaart.scitevents.org/NLPinAI.aspx?y=2023>)
(<https://icaart.scitevents.org/NLPinAI.aspx>)
 - NLPinAI 2022, within ICAART 2022, 3–5 February 2022
(<https://icaart.scitevents.org/NLPinAI.aspx?y=2022>)
 - NLPinAI 2021, within ICAART 2021, 4–6 February 2021
(<https://icaart.scitevents.org/NLPinAI.aspx?y=2021>)
 - NLPinAI 2020, within ICAART 2020, 22–24 February 2020, Valletta, Malta
(<https://icaart.scitevents.org/NLPinAI.aspx?y=2020>)

- NLPinAI 2019, within ICAART 2019, 19–21 January 2019, Prague, Czech Republic (<https://icaart.scitevents.org/NLPinAI.aspx?y=2019>)
- NLPinAI 2018 within ICAART 2018, 16-18 January, 2018 - Funchal, Madeira, Portugal (<https://icaart.scitevents.org/NLPinAI.aspx?y=2018>)
- The founder and a co-chair of: of Special Session on Partiality, Underspecification, and Natural Language Processing - PUA_{NLP} at International Conference on Agents and Artificial Intelligence - ICAART
 - PUA_{NLP} 2017 at ICAART 2017, Rome, Italy, 24–26 February, 2017 (<https://icaart.scitevents.org/PUANLP.aspx?y=2017>)
 - PUA_{NLP} 2016 at ICAART 2016, Rome, Italy, 24–26 February, 2016 (<https://icaart.scitevents.org/PUANLP.aspx?y=2016>)
 - PUA_{NLP} 2015 at ICAART 2015, Lisbon, Portugal, 10–12 January, 2015 (<https://icaart.scitevents.org/SpecialSessions.aspx?y=2015>)
- The founder and a co-chair of:
Special Session on Natural Language and Argumentation 2020 (NLA'20) at the 17th International Conference on Distributed Computing and Artificial Intelligence — DCAI'20, ONLINE, 7th-9th October, 2020 (<https://www.dcai-conference.net>)
- The founding organizer and a co-chair of the International Workshop on AI aspects of Reasoning, Information, and Memory, (AIRIM) since 2016, AIRIM'16, AIRIM'17, AIRIM'18, continued by the International Workshop on AI aspects in Reasoning, Languages, and Computation (AIRLangComp) at the Federated Conference on Computer Science and Information Systems (<https://www.fedcsis.org>)
 - AIRLangComp'19, Leipzig, Germany, 1 - 4 September, 2019 (<https://www.fedcsis.org/2019/airlangcomp>)
 - AIRIM'18, Poznań, Poland, 9 - 12 September, 2018 (<https://www.fedcsis.org/2018/airim>)
 - AIRIM'17, Prague, Czech Republic, 4 - 7 September, 2017 (<https://www.fedcsis.org/2017/airim>)
 - AIRIM'16, Gdansk, Poland, 11 - 14 September, 2016 (<https://www.fedcsis.org/2016/airim>)
- A member of the local organization committees of
 - The third Nordic Logic Summer School 2017, Stockholm, 7-11 August, 2017
 - Logic Colloquium 2017, Stockholm, 14-20 August, 2017
 - Computer Science Logic, CSL'2017 — the annual conference of the European Association for Computer Science Logic (EACSL), Stockholm, August 20-24, 2017
- The founder and a chair of the Special Session on Logic, Information, Language, Memory, Reasoning 2017 (LogInfoLangMR17), at the 14th International Conference on Distributed Computing and Artificial Intelligence 2017 (DCAI'17), Polytechnic of Porto, Porto (Portugal), 21st–23rd June, 2017 (<https://www.dcai-conference.net/>)
- The organizer and a co-chair of the Special Session S2: Languages, Information, and Computational Intelligence — LangInfoCompInt 2015 at the IEEE Region 10 International Conference (IEEE TENCON 2015)

14.2 Reviewing and Member of Program Committees

14.2.1 Area Supervisory Committee

- Area Supervisory Committee | Track Program Committee | Program Committee for Federated conference on Computer Science and Information Systems — FedCSIS: International Symposium Advances in Artificial Intelligence and Applications (AAIA), FedCSIS - AAIA, 2017–2019 (<https://fedcsis.org/2017/aaia/committee>)

14.2.2 Program Committees

- The founder and chair of ongoing:
Special Session on Natural Language Processing in Artificial Intelligence - NLPinAI, within the International Conference on Agents and Artificial Intelligence - ICAART
NLPinAI is a continuation of the series PUaNLP 2015–2017 at ICAART.
(<https://icaart.scitevents.org/NLPinAI.aspx>) (<https://icaart.scitevents.org>)
- The founder and chair of:
Special Session on Natural Language and Argumentation 2020 (NLA'20)
(<https://www.dcai-conference.net/special-sessions/nla20>)
at the 17th International Conference on Distributed Computing and Artificial Intelligence — DCAI'20, 7th-9th October, 2020
- IEEE/WIC/ACM International Joint Conference on Web Intelligence and Intelligent Agent Technology (WI-IAT), since 2014
- International Conference on Brain Informatics (BI), since 2014
- International Symposium Advances in Artificial Intelligence and Applications AAIA, since 2015, at Federated conference on Computer Science and Information Systems — FedCSIS (<https://fedcsis.org>)
- International Conference on Brain Informatics (BI 2019) — Brain Science meets Artificial Intelligence December 13–15, 2019, Haikou, Hainan, China
(<http://wi-consortium.org/conferences/bi2019/index.html>)
- Workshop on Linguistic Complexity and Natural Language Processing (LC&NLP). Workshop at the 27th International Conference on Computational Linguistics (COLING 2018). Santa Fe, New Mexico (U.S.), 25 August 2018. (<https://lcandnlp.wordpress.com>)
- Workshop *Situations, Information, and Semantic Content*, Munich Center for Mathematical Philosophy (MCMP), LMU, Ludwig-Maximilians-Universität München 16-18 December, 2016 (<http://www.situatedcontent2016.philosophie.uni-muenchen.de/index.html>)
- Special session on Partiality, Underspecification, and Natural Language Processing - PUaNLP 2015–2017 at ICAART
- The IEEE Region 10 International Conference (TENCON 2015)

15 Other International Engagements

See the Section in my CV about Visiting positions and fellowships. The following is a selection of participation at international events.

15.1 Some Conference and Seminar Participation, Talks, Presentations

- Loukanova, Roussanka: Logic Operators and Quantifiers in Type-Theory of Algorithms. at: International Conference Logic and Engineering of Natural Language Semantics 19 (LENLS19). Nov 20, 2022. Hosted by The Association for Logic, Language and Information (FoLLI). <https://lenls.github.io/lenls19/>

- Loukanova, Roussanka: Logic Operators and Quantifiers in Type-Theory of Algorithms. (on extended work) at: Seminar of Algebra and Logic. Institute of Mathematics and Informatics (IMI), Bulgarian Academy of Sciences (BAS). Nov 25, 2022.
http://www.math.bas.bg/algebra/seminarAiL/2022/No27_2022_11_25_R_Loukanova/Algebra_Logika_seminar_25-11-2022.pdf
- *Algorithmic Dependent-Type Theory of Situated Information and Context Assessments*. 19th International Conference on Distributed Computing and Artificial Intelligence | L'Aquila (Italy), 13th–15th July, 2022. (pdf)
- *Dependent-Type Theory of Situated Information with Context Assessments*. Seminar of Algebra and Logic, Department of Algebra and Logic, Institute of Mathematics and Informatics (IMI), Bulgarian Academy of Sciences (BAS), Bulgaria, Online, 24 Jun 2022
(abstract) (slides at IMI, pdf) / (slides at SU, pdf)
- *Restricted Quantification in New Type-Theory of Algorithms*. Seminar of Algebra and Logic, Department of Algebra and Logic, Institute of Mathematics and Informatics (IMI), Bulgarian Academy of Sciences (BAS), Bulgaria, Online, 03 Dec 2021 (abstract) / (slides at IMI, pdf) (slides at SU, pdf)
(<http://www.math.bas.bg/algebra/seminarAiL/index2021.html>)
(<http://www.math.bas.bg/algebra/seminarAiL/>)
- *Reduction Calculus of Type-Theory of Acyclic Algorithms, Parts I–II*. Seminar of Algebra and Logic, Department of Algebra and Logic, Institute of Mathematics and Informatics (IMI), Bulgarian Academy of Sciences (BAS), Bulgaria, Online abstract, 29 Feb 2021 / abstract, 5 Feb 2021 / (slides at IMI, BAS) (slides at SU pdf)
(<http://www.math.bas.bg/algebra/seminarAiL/index2021.html>)
- *Type-Theory of Parametric Algorithms*. 2020 Annual Report Session of the Department of Algebra and Logic, Institute of Mathematics and Informatics (IMI), Bulgarian Academy of Sciences (BAS), Bulgaria, Online, 18 Dec 2020 (slides at SU, pdf) (slides at IMI, pdf) / (<http://www.math.bas.bg/algebra/seminarAiL/>)
- *Type-Theory of Acyclic Algorithms for Semantics of Natural Languages*. 56th Linguistics Colloquium, Nov 26–28 2020 (<https://sites.google.com/view/lingcoll>) (pdf)
- *Algorithmic Dependent-Type Theory of Situated Information*. 56th Linguistics Colloquium, Nov 26–28, 2020 (<https://sites.google.com/view/lingcoll>) (pdf)
- *Type-Theory of Parametric Algorithms with Restricted Computations*. 17th International Conference on Distributed Computing and Artificial Intelligence — DCAI'20. 7th-9th October, 2020 L'Aquila, Italy, Online (<https://www.dcai-conference.net/>) (pdf)
- *Algorithmic Eta-Reduction in Type-Theory of Acyclic Recursion*. ICAART 2020, 22–24 February 2020, Valletta, Malta
(<https://icaart.scitevents.org/Abstract.aspx?idEvent=vY/cqtoX0JM=>)
- *Type-Theory of Acyclic Recursion and its Reduction Calculus*. Institute of Mathematics and Informatics, Bulgarian Academy of Sciences, Bulgaria
(http://www.math.bas.bg/algebra/seminarAiL/Algebra_Logika_seminar_30-08-2019.pdf)
- *Computational Syntax-Semantics Interface with Type-Theory of Acyclic Recursion for Underspecified Semantics*. Computing Semantics with Types, Frames and Related Structures. Workshop at IWCS 2019. May 24th, 2019, University of Gothenburg, Sweden
(<https://sites.google.com/view/cstfrsworkshop/>)
- *Relations between Specified and Underspecified Quantification by Moschovakis Theory of Acyclic Recursion*. Logic, Language, and Mind Seminar, CLLAM, Department of Philosophy, Stockholm University. 15 March 2019
- *Type-Theory of Acyclic Algorithms with Generalised Immediate Terms*. 11th International Conference on Agents and Artificial Intelligence (ICAART 2019). Knowledge Representation

and Reasoning. 19–21 January 2019, Prague, Czech Republic

(<https://icaart.scitevents.org/Abstract.aspx?idEvent+=cR5/GjpHzw=>)

(<https://icaart.scitevents.org/Home.aspx?y=2019>)

- *Formalisation of Situated Dependent-Type Theory with Underspecified Assessments*. Decision Economics. Designs, Models, and Techniques for Boundedly Rational Decisions. DCAI 2018. 20–23 June 2018, Toledo, Spain
- *Syntax-Semantics Interfaces of Modifiers*. Distributed Computing and Artificial Intelligence, 15th International Conference. DCAI 2018. Special Session on Complexity in Natural and Formal Languages (CNFL). 20–23 June 2018, Toledo, Spain
- *Type-theory of acyclic recursion and its calculi*. Second Workshop on Mathematical Logic and its Applications, 5–9 March 2018, Kanazawa, Japan
(<http://www.jaist.ac.jp/is/labs/ishihara-lab/mla2018/index.html>)
- *Gamma-star Reduction in the Type-theory of Acyclic Recursion*. 10th International Conference on Agents and Artificial Intelligence, ICAART 2018, 16–18 January, 2018 - Funchal, Madeira, Portugal (<https://icaart.scitevents.org/?y=2018>)
- *Moschovakis Acyclic Recursion and its Reduction Calculi*. Talk given at Mini-Symposium: CORCON 4 Dec17. Department of Mathematics and Statistics, University of Canterbury, Christchurch, New Zealand. 4 December 2017
- *Semantic Argument Slots in the Type-Theory of Acyclic Recursion and Syntax-Semantics Interfaces in CBLG*. at: Logic and Engineering of Natural Language Semantics 14 (LENLS 14) a workshop of the JSAI International Symposia on AI (isAI2017)
- Invited talk: *Algorithmic Concepts of Situated Information*. Symposium *Possible Worlds: Problems and Prospects* at the Ninth European Congress of Analytic Philosophy (ECAP9), 21-26 August 2017, Munich (<http://analyticphilosophy.eu/ecap9/>)
- Invited talk: *Type Theory of Situated Information*, Workshop on Logic and Algorithms in Computational Linguistics 2017 (LACompLing17), Stockholm, August 26, 2017
(<https://staff.math.su.se/rloukanova/LACompLing17.html>)
- Contributed talk: *Type Theory of Restricted Algorithms and Neural Networks*. Logic Colloquium 2017, August 14-20 2017, Stockholm
(<https://www.math-stockholm.se/en/konferenser-och-akti/logic-in-stockholm-2/logic-colloquium-201>)
- *Type Theory of Situated Algorithms (TTofSitAlg)*. New Worlds of Computation (NWC 2017) and Journées Calculabilités 12-14 Apr 2017, Orléans, France
(<https://nwc2017-jcal.sciencesconf.org>)
- Invited speaker to the workshop *Situations, Information, and Semantic Content*, Munich Center for Mathematical Philosophy (MCMP), LMU, Ludwig-Maximilians-Universität München, 16-18 December, 2016
(<http://www.situatedcontent2016.philosophie.uni-muenchen.de/index.html>)
- *Underspecified Quantification by the Theory of Acyclic Recursion*. International Conference on Practical Applications of Agents and Multi-Agent Systems, PAAMS 2016, Sevilla Spain, 1-3 June, 2016 (<http://paams.net/>)
- *A Formal Language of Type Theory of Situated Information*. 27th Nordic Congress of Mathematicians, Institut Mittag-Leffler, Stockholm, 16-20 March, 2016
(<http://www.mittag-leffler.se/congress-2016>)
- *Reduction Calculi in Type Theory of Acyclic Recursion and Applications*. 27th Nordic Congress of Mathematicians, Institut Mittag-Leffler, Stockholm, 16-20 March, 2016
(<http://www.mittag-leffler.se/congress-2016>)
- *A Formalization of Generalized Parameters in Situated Information*. Paper presentation at the Special Session on Partiality, Underspecification, and Natural Language Processing - PUA NLP 2016, 8th ICAART 2016 (<https://icaart.scitevents.org/PUANLP.aspx?y=2016>)
- *Acyclic Recursion with Polymorphic Types and Underspecification*. Paper presentation at the

- 8th International Conference on Agents and Artificial Intelligence — ICAART 2016 (<https://icaart.scitevents.org/?y=2016>)
- *Gamma-Reduction in Type Theory of Acyclic Recursion*. Talk at the Stockholm Logic Seminar, Department of Mathematics, Stockholm University. 2016, February 17 (<http://logic.math.su.se/seminar>)
 - *Gamma-Reduction in Type Theory of Acyclic Recursion*. Talk at the Logic Seminar, Department of Mathematics, Indiana University, IU Bloomington (January 2016)
 - *Specification of Underspecified Quantifiers via Question-Answering by the Theory of Acyclic Recursion*. Flexible Query Answering Systems (FQAS) 2015, October 26–28, 2015, Cracow, Poland (<http://fqas2015.ibspan.waw.pl>)
 - *Representing Parametric Concepts with Situation Theory*. The 10th International Symposium Advances in Artificial Intelligence and Applications (AAIA'15), Lodz, Poland, 13–16 September, 2015 (<https://fedcsis.org/aaia>)
 - Presentation *Underspecified Relations with a Formal Language of Situation Theory*. ICAART 2015, the 7th International Conference on Agents and Artificial Intelligence, Lisbon, Portugal, 10–12 January, 2015 (<https://icaart.scitevents.org>)
 - *Algorithmic Granularity with Constraints*. 2013 International Conference on Brain and Health Informatics (BHI 2013), October 29–31, 2013, Maebashi Terrsa, Chiyodamachi, Maebashi-city, Gunma, Japan. (http://wi-consortium.org/conferences/amtbi13/bhi/index.php?category=accepted_ws)
 - *Algorithmic Semantics for Processing Pronominal Verbal Phrases*. 10th International Conference on Flexible Query Answering Systems 2013 (FQAS 2013) (<http://idbis.ugr.es/fqas2013>)
 - *Semantic Information with Type Theory of Acyclic Recursion*. Presentation at the 8th International Conference, AMT 2012, Macau, China, December 4–7, 2012. (<http://www.fst.umac.mo/wic2012/AMT>)
 - *Algorithmic Semantics of Ambiguous Modifiers by the Type Theory of Acyclic Recursion*. Presentation at: 2011 IEEE/WIC/ACM International Conferences on Web Intelligence and Intelligent Agent Technology (WI-IAT 2012) Workshops. Natural Language Processing and Ontology Engineering (NLPOE 2012) 4–7 December 2012, Macau, China
 - *A Predicative Operator and Underspecification by the Type Theory of Acyclic Recursion*. Presentation. Constraint Solving and Language Processing (CSLP) workshop. 13–14 September 2012, LIFO, the Computer Science laboratory of the University of Orléans, France (<https://www.univ-orleans.fr/lifo/evenements/CSLP2012/>)
 - *Computational Syntax-Semantics Interface of Passive Forms with The Language of Acyclic Recursion*. Presentation at: TURING CENTENARY CONFERENCE: CiE 2012 - How the World Computes (<http://www.mathcomp.leeds.ac.uk/turing2012/WScie12>)
 - *A New Perspective of Abstract Syntax with the Grammatical Framework GF*. Presentation at: Computability in Europe CiE 2011: Models of Computation in Context. Sofia, Bulgaria (<https://cie2011.fmi.uni-sofia.bg>)
 - *Algorithmic Intensionality and Underspecification of Verb-Phrase Ellipsis*. An extended abstract presented at the 14th Congress of Logic, Methodology, and Philosophy of Science (CLMPS 2011) — Nancy, France, 19–26 July, 2011: Symposium: Hyperintension, intension, extension (<https://www.clmps2011.org>)
 - *Computational intension, denotation, and propositional intention in the languages of acyclic recursion*. Presentation at: Logic Colloquium 2009, ASL (<https://lc2009.fmi.uni-sofia.bg/contributedslides/Loukanova.pdf>)
 - *Formalisation of Intensionality as Algorithms*. (project outline) In: Eight International Conference on Computational Semantics. ACL Anthology. A Digital Archive of Research Papers in Computational Linguistics. (<https://aclanthology.org/W09-3731.pdf>)

15.2 Tutorials

- Tutorial *Higher-Order Situation Theory in Artificial Intelligence* at ICAART 2016, the 8th International Conference on Agents and Artificial Intelligence (<https://icaart.scitevents.org/Tutorials.aspx?y=2016>)

Part VII

Scientific Works

16 Work in Progress

- (1) *Some Higher-Order Logics for Type-Theoretic Semantics: TY2, TT2, and IL of Natural Language*. Draft, Preprint File at ResearchGate: https://www.researchgate.net/publication/237405252_Some_Higher-Order_Logics_for_Type-Theoretic_Semantics_TY2_TT2_and_IL_of_Natural_Language
- (2) *Type-Theory of Acyclic Algorithms for Semantics of Natural Languages*
- (3) *Algorithmic Dependent-Type Theory of Situated Information*
- (4) *Type Theory of Situated Information and its Dependent Types*

17 List of Publications

17.1 Publications in Journals or Book Chapters — Refereed

- (1) Loukanova, R.: *Type-Theory of Parametric Algorithms with Restricted Computations*. In: ADCAIJ: Advances in Distributed Computing and Artificial Intelligence Journal. Salamanca University Press. 2023. 44 pages. (in production)
- (2) Loukanova, R.: *Eta-Reduction in Type-Theory of Acyclic Recursion*. In: ADCAIJ: Advances in Distributed Computing and Artificial Intelligence Journal. Salamanca University Press. 2023. 22 pages (in production)
- (3) Loukanova, R. *Currying Order and Restricted Algorithmic Beta-Conversion in Type Theory of Acyclic Recursion*. In: Pavel Materna and Bjørn Jespersen (eds). *Logically Speaking. A Festschrift for Marie Duží*. Book Tribute. 2022. Volume 49. pp. 285–310. College Publications. ISBN-10: 1848904193 ISBN-13: 978-1848904194 (<http://www.collegepublications.co.uk/tributes/?00049>) preprint at ResearchGate: DOI: 10.13140/RG.2.2.34553.75365 (<https://doi.org/10.13140/RG.2.2.34553.75365>)
- (4) Loukanova, R.: *Type-Theory of Acyclic Algorithms for Models of Consecutive Binding of Functional Neuro-Receptors*. In: Grabowski A., Loukanova R., Schwarzweller C. (eds) *AI Aspects in Reasoning, Languages, and Computation*. Book series: *Studies in Computational Intelligence (SCI)*. 2020. Volume 889. pp. 1–48. Springer International Publishing. Cham. DOI: 10.1007/978-3-030-41425-2_1 (https://doi.org/10.1007/978-3-030-41425-2_1) (preprint: [PDF](#))
- (5) Loukanova, R.: *Gamma-Reduction in Type Theory of Acyclic Recursion*. *Fundamenta Informaticae*, Volume 170, no. 4, pp. 367–411, 2019. IOS Press. DOI: 10.3233/FI-2019-1867 (<https://doi.org/10.3233/FI-2019-1867>) (preprint: [PDF](#))

- (6) R. Loukanova. *Gamma-Star Canonical Forms in the Type-Theory of Acyclic Algorithms*. In: van den Herik J., Rocha A. (eds) *Agents and Artificial Intelligence. ICAART 2018. Lecture Notes in Computer Science, Volume 11352*. 2019. pp. 383–407. Springer International Publishing, Cham. Print ISBN 978-3-030-05452-6 Online ISBN 978-3-030-05453-3 DOI: 10.1007/978-3-030-05453-3.18
(https://doi.org/10.1007/978-3-030-05453-3_18) (preprint: [PDF](#))
- (7) Loukanova, R.: *Partiality, Underspecification, Parameters and Natural Language*. In: H. Christiansen, M. D. Jiménez-López, R. Loukanova, L. S. Moss (Eds). *Partiality and Underspecification in Information, Languages, and Knowledge*. 2017. pp. 109–150. Cambridge Scholars Publishing. ISBN (13) 978-1-4438-7947-7; (10) 1-4438-7947-9
(<https://www.cambridgescholars.com/product/978-1-4438-7947-7>) (preprint: [PDF](#))
- (8) Loukanova, R.: *Typed Theory of Situated Information and its Application to Syntax-Semantics of Human Language*. In: H. Christiansen, M. D. Jiménez-López, R. Loukanova, L. S. Moss (Eds.). *Partiality and Underspecification in Information, Languages, and Knowledge*. 2017. pp. 151–188. Cambridge Scholars Publishing. ISBN (13) 978-1-4438-7947-7; (10) 1-4438-7947-9
(<https://www.cambridgescholars.com/product/978-1-4438-7947-7>)
(preprint: [PDF](#))
- (9) Loukanova, R.: *An Approach to Functional Formal Models of Constraint-Based Lexicalist Grammar (CBLG)*. *Fundamenta Informaticae* — Volume 152, issue 4, 2017. pp. 341–372. IOS Press. ISSN 0169-2968 (P) 1875-8681 (E) DOI: 10.3233/FI-2017-1524
(<https://doi.org/10.3233/FI-2017-1524>) (preprint: [PDF](#))
- (10) Loukanova, R.: *Relationships between Specified and Underspecified Quantification by the Theory of Acyclic Recursion*. In: *ADCAIJ: Advances in Distributed Computing and Artificial Intelligence Journal. Regular Issue Volume 5 N. 4*, 2016. pp. 19–42. Salamanca University Press. ISSN 2255-2863
(<https://doi.org/10.14201/ADCAIJ2016541942>) (preprint: [PDF](#))
(http://campus.usal.es/~revistas_trabajo/index.php/2255-2863/article/view/ADCAIJ2016541942/15949)
- (11) Loukanova, R.: *Situation Theory, Situated Information, and Situated Agents*. In: *Transactions on Computational Collective Intelligence XVII*. Nguyen, N.T., Kowalczyk, R., Fred, A., Joaquim, F. (Eds.). *Lecture Notes in Computer Science, Volume 8790*, 2014, pp. 145–170. Springer, Berlin, Heidelberg. ISBN 978-3-662-44993-6
(https://doi.org/10.1007/978-3-662-44994-3_8) (preprint: [PDF](#))
- (12) Loukanova, R.: *A Predicative Operator and Underspecification by the Type Theory of Acyclic Recursion*. In: *Constraint Solving and Language Processing. CSLP 2012*. D. Duchier and Y. Parmentier (Eds.). *Lecture Notes in Computer Science, Volume 8114*, 2013, pp. 108–132. Springer, Berlin, Heidelberg. Print ISBN 978-3-642-41577-7 Online ISBN 978-3-642-41578-4
(https://doi.org/10.1007/978-3-642-41578-4_7) (preprint: [PDF](#))
- (13) Loukanova, R. and Jiménez-López, M. D. : *On the Syntax-semantics Interface of Argument Marking Prepositional Phrases*. In: Pérez et al. (Eds.). *Highlights on Practical Applications of Agents and Multiagent Systems. Advances in Intelligent and Soft Computing, Volume 156*, 2012, pp. 53–60. Springer, Berlin, Heidelberg. Print ISBN 978-3-642-28761-9 Online ISBN 978-3-642-28762-6
(https://doi.org/10.1007/978-3-642-28762-6_7) (preprint: [PDF](#))
- (14) Loukanova, R.: *Modeling Context Information for Computational Semantics with the Language of Acyclic Recursion*. In: Pérez et al. (Eds.). *Highlights in Practical Applications of Agents and*

- Multiagent Systems. *Advances in Intelligent and Soft Computing*. Volume 89, 2011, pp. 265–274. Springer, Berlin, Heidelberg. Print ISBN 978-3-642-19916-5 Online ISBN 978-3-642-19917-2 (https://doi.org/10.1007/978-3-642-19917-2_32) (preprint: [PDF](#))
- (15) Loukanova, R.: *Reference, Co-reference and Antecedent-anaphora in the Type Theory of Acyclic Recursion*. In: Gemma Bel-Enguix and María Dolores Jiménez-López (Eds.). *Bio-Inspired Models for Natural and Formal Languages*. Cambridge Scholars Publishing. 2011. Chapter IV. pp. 81–102. ISBN (10): 1-4438-2725-8, (13): 978-1-4438-2725-6 (This is a chapter based on [17.2-\(52\)](#).) (<https://www.cambridgescholars.com/product/978-1-4438-2725-6>) (preprint: [PDF](#))
- (16) Loukanova, R.: *Semantics with the Language of Acyclic Recursion in Constraint-Based Grammar*. In: Gemma Bel-Enguix and María Dolores Jiménez-López (Eds.). *Bio-Inspired Models for Natural and Formal Languages*. Cambridge Scholars Publishing. 2011. Chapter V. pp. 103–134. ISBN (10): 1-4438-2725-8, (13): 978-1-4438-2725-6 (This is a chapter based on [17.2-\(53\)](#).) (<https://www.cambridgescholars.com/product/978-1-4438-2725-6>) (preprint: [PDF](#))
- (17) Loukanova, R.: *From Montague’s Rules of Quantification to Minimal Recursion Semantics and the Language of Acyclic Recursion*. In: Gemma Bel-Enguix, Veronica Dahl, and María Dolores Jiménez-López (Eds.). *Biology, Computation and Linguistics*. Volume 228. Book Series: Frontiers in Artificial Intelligence and Applications. 2011, pp. 200–214. IOS Press. ISBN 978-1-60750-761-1 (print) 978-1-60750-762-8 (online) (This is a chapter based on [17.2-\(50\)](#).) (<https://doi.org/10.3233/978-1-60750-762-8-200>) (preprint: [PDF](#))
- (18) Loukanova, R.: *Syntax-Semantics Interface for Lexical Inflection with the Language of Acyclic Recursion*. In: Gemma Bel-Enguix, Veronica Dahl, and María Dolores Jiménez-López (Eds.). *Biology, Computation and Linguistics*. Volume 228. Book Series: Frontiers in Artificial Intelligence and Applications. 2011, pp. 215–236. IOS Press. ISBN 978-1-60750-761-1 (print) 978-1-60750-762-8 (online) (This is a chapter based on [17.2-\(46\)](#).) (<https://doi.org/10.3233/978-1-60750-762-8-215>) (preprint: [PDF](#))
- (19) Loukanova, R.: *Computational Syntax-Semantics Interface*. In: Gemma Bel-Enguix and María Dolores Jiménez-López (Eds.). *Language as a Complex System: Interdisciplinary Approaches*. Cambridge Scholars Publishing. 2010. Chapter Five. pp. 111–150. ISBN-13: 978-1-4438-1762-2 ISBN-10: 1-4438-1762-7 (<https://www.cambridgescholars.com/product/978-1-4438-1762-2>) (preprint: [PDF](#))
- (20) Loukanova, R. and Pavlov, R.: *Situation Semantics Analyses of Some Nominals in Bulgarian*. *Current Advances in Semantic Theory*. Maxim Stamenov (Ed.) Volume 73. John Benjamin Publishing Company. Amsterdam/Philadelphia. 1992.
- (21) Lukanova (spelling variant of Loukanova), R. *Pseudocombinatory Spaces and Recursiveness in them*. MTA SZTAKI Tanulmányok. Volume 182. pp. 89–96. 1986. (in Russian)

17.2 Publications in Refereed Conference Proceedings

- (22) Loukanova, R.: *Logic Operators and Quantifiers in Type-Theory of Algorithms*. In: Proceedings of the 19th International Workshop of Logic and Engineering of Natural Language Semantics 19 (LENLS19). Hosted by The Association for Logic, Language and Information (FoLLI). pp. 82–86. 2022. (<https://lenls.github.io/lenls19/LENLS19OnlineProceedings.pdf>)
- (23) Loukanova, R.: *Algorithmic Dependent-Type Theory of Situated Information and Context Assessments*. In: Omatu, S., Mehmood, R., Sitek, P., Cicerone, S., Rodríguez, S. (eds) *Distributed*

- Computing and Artificial Intelligence, 19th International Conference. DCAI 2022. Lecture Notes in Networks and Systems, Volume 583. pp. 31–41. 2023. Springer, Cham.
Print ISBN 978-3-031-20858-4 Online ISBN 978-3-031-20859-1
(https://doi.org/10.1007/978-3-031-20859-1_4)
([Preprint on ResearchGate](#)) / (preprint on my website: [PDF](#))
- (24) Loukanova, R.: *Type-Theory of Parametric Algorithms with Restricted Computations*. In: Dong, Y., Herrera-Viedma, E., Matsui, K., Omatsu, S., González Briones, A., Rodríguez González, S. (eds) Distributed Computing and Artificial Intelligence, 17th International Conference. DCAI 2020. Advances in Intelligent Systems and Computing, Volume 1237. pp. 321–331. 2021. Springer, Cham. Online ISBN 978-3-030-53036-5 (preprint: [PDF](#))
Print ISBN 978-3-030-53035-8 Online ISBN 978-3-030-53036-5
(https://doi.org/10.1007/978-3-030-53036-5_35)
- (25) Loukanova, R.: *Algorithmic Eta-Reduction in Type-Theory of Acyclic Recursion*. In: Proceedings of the 12th International Conference on Agents and Artificial Intelligence. Ana Rocha, Luc Steels, Jaap van den Herik (Eds.) Volume 2, ICAART, 2020. pp. 1003–1010. SciTePress. ISBN: 978-989-758-395-7 DOI: 10.5220/0009182410031010 ([PDF](#))
(<https://doi.org/10.5220/0009182410031010>)
- (26) Loukanova, R.: *Computational Syntax-Semantics Interface with Type-Theory of Acyclic Recursion for Underspecified Semantics*. In: Proceedings of the IWCS 2019 Workshop on Computing Semantics with Types, Frames and Related Structures. Rainer Osswald, Christian Retoré, Peter Sutton (Eds.) May 24, 2019 Gothenburg, Sweden. pp. 37–48. Association for Computational Linguistics (ACL). ISBN: 978-1-950737-25-3
(<https://aclweb.org/anthology/papers/W/W19/W19-1005/>)
- (27) Loukanova, R.: *Type-Theory of Acyclic Algorithms with Generalised Immediate Terms*. In: Proceedings of the 11th International Conference on Agents and Artificial Intelligence. Ana Rocha, Luc Steels, Jaap van den Herik (Eds.) Volume 2: ICAART, 2019. pp. 746–754. SciTePress - Science and Technology Publications, Lda. ISBN: 978-989-758-350-6 ([PDF](#))
(<https://doi.org/10.5220/0007410207460754>)
- (28) Loukanova, R.: *Formalisation of Situated Dependent-Type Theory with Underspecified Assessments*. In: Decision Economics. Designs, Models, and Techniques for Boundedly Rational Decisions. DCAI 2018. Bucciarelli, Edgardo, Chen, Shu-Heng, Corchado, Juan M. (Eds.). Series: Advances in Intelligent Systems and Computing. Volume 805. pp. 49-56. 2019. Springer International Publishing, Cham.
(https://doi.org/10.1007/978-3-319-99698-1_6) (preprint: [PDF](#))
- (29) Loukanova, R.: *Syntax-Semantics Interfaces of Modifiers*. In: Rodríguez S. et al. (eds) Distributed Computing and Artificial Intelligence, Special Sessions, 15th International Conference. DCAI 2018. Advances in Intelligent Systems and Computing, Volume 801. pp. 231–239. 2019. Springer International Publishing, Cham.
(https://doi.org/10.1007/978-3-319-99608-0_26) (preprint: [PDF](#))
- (30) Loukanova, R.: *Gamma-star Reduction in the Type-theory of Acyclic Recursion*. In: Ana Paula Rocha and Jaap van den Herik (Eds.). Proceedings of the 10th International Conference on Agents and Artificial Intelligence (ICAART 2018) - Volume 2, pages 231–242. 2018. Publisher: SciTePress - Science and Technology Publications, Lda. ISBN: 978-989-758-275-2 DOI 10.5220/0006662802310242
(<https://doi.org/10.5220/0006662802310242>)
- (31) Loukanova, R.: *Semantic Argument Slots in the Type-Theory of Acyclic Recursion and Syntax-Semantics Interfaces in CBLG*. In the proceedings of Logic and Engineering of Natural Language

- Semantics 14 (LENLS 14), a workshop of the JSAI International Symposia on AI (isAI2017) (<http://www.is.ocha.ac.jp/~bekki/lenls/lenls14/index.html>)
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17.3 Books

- (67) Baynov, D., S. Kostadinov, R. Pavlov, R. Loukanova. *A book on tasks in Discrete Mathematics*. Plovdiv. 1990. (in Bulgarian)
- (68) Chimev, K., R. Pavlov, R. Loukanova. *A book on tasks in Discrete Mathematics*. HPI – Blagoevgrad. 1989. (in Bulgarian)

17.4 Publications on Pedagogy

- (1) Loukanova, R.: *Teaching with the Computerised Package Language, Proof, and Logic (LPL)* In: Boute, R and J.N. Oliveira (Eds.). *Formal Methods in the Teaching Lab*. Formal Methods 2006 Symposium McMaster University, Ontario, Canada. Workshop Preprints. pp. 101–110.
(<http://www.di.uminho.pt/FME-SoE/FMEd06/Preprints.pdf>)
- (2) Loukanova, R.: *Teaching Formal Methods for Computational Linguistics at Uppsala University*. In: P. Boca, J.P. Bowen, D.A. Duce (Eds.). *Teaching Formal Methods: Practice and Experience*. 15 Dec 2006. Oxford Brookes University and BCS-FACS. Proceedings, pp. 57–62.

17.5 Selected Teaching Materials

- (1) *First Order Logic: Syntax, Semantics, and Logic. Atomic Sentences, Boolean Connectives, Quantifiers*
Abstract: Introduction to First Order Logic (FOL): lectures developed by me and taught partly on-line, using the LPL courseware: Language, Proof and Logic: Tarski's World, Fitch, Boole, (LPL) by Dave Barker-Plummer, Jon Barwise, and John Etchemendy CSLI Publications, Stanford (<https://www.grade grinder.net>)
File ([1ec3-10-FOL-LPL-4up.pdf](#)) at ResearchGate: DOI: 10.13140/RG.2.2.30778.88005
(<https://doi.org/10.13140/RG.2.2.30778.88005>)
- (2) *Computational Semantics. From Leibniz, Ongoing Passion for Life, Math and Computers*
Abstract: Initial Lecture Notes on Computational Semantics, in First Order Languages and Logic, and Foundations of Syntax-Semantics Interface
File ([init-CompSem1.pdf](#)) at ResearchGate: DOI: 10.13140/RG.2.2.24906.85444
(<https://doi.org/10.13140/RG.2.2.24906.85444>)
- (3) *Lecture Notes: Foundation of Computer Science, II*
Lecture Notes for courses covering topics on Introduction to Formal Languages, Grammars, and Automata Theory.
File ([FoundCompSci2-07a.pdf](#)) at ResearchGate:
DOI: 10.13140/RG.2.2.19549.28648 (<https://doi.org/10.13140/RG.2.2.19549.28648>)
- (4) Lecture Notes for Advanced Computational Semantics: Logic Foundations of Montague Grammars
Muskens' Relational Montague Grammar. Part I-II: The Logics TY2, TT2, and IL. Lectures on Advanced Computational Semantics
File ([ty2tt2-4up.pdf](#)) at ResearchGate: DOI: 10.13140/RG.2.2.26678.37449
(<https://doi.org/10.13140/RG.2.2.26678.37449>)
- (5) Lecture Notes for Advanced Computational Semantics: a Revision of Montague Grammar
Muskens' Relational Montague Grammar. Part III: PTQ Revised. Lectures on Advanced Computational Semantics
File ([rev-ptq-4up.pdf](#)) at ResearchGate: DOI: 10.13140/RG.2.2.21645.20961
(<https://doi.org/10.13140/RG.2.2.21645.20961>)
- (6) *Logics for Linguistics*, a series of lectures and seminars (co-organiser and lecturer), see Part 2:
<https://staff.math.su.se/rloukanova/logling>

17.6 Editor

- (1) Roussanka Loukanova, Peter LeFanu Lumsdaine, Reinhard Muskens (Editors). *Logic and Algorithms in Computational Linguistics 2021 (LACompLing2021)* Book series: Studies in Computational Intelligence (SCI). Springer International Publishing, Cham. 2023. (in production)
(<https://www.springer.com/series/7092>)
- (2) Distributed Computing and Artificial Intelligence, Volume 2, Special Sessions, 19th International Conference. DCAI 2022 (to be published 2023)
- (3) González S.R., Machado, J.M., González-Briones, A., Wikarek, J., Loukanova, R., Katranas G., Casado-Vara, R. (Editors): *Distributed Computing and Artificial Intelligence. Volume 2: Special Sessions 18th International Conference*. Series: Lecture Notes in Networks and Systems. Volume 332. 2022. Springer International Publishing. eBook ISBN 978-3-030-86887-1. DOI 10.1007/978-3-030-86887-1
<https://link.springer.com/book/10.1007/978-3-030-86887-1>
- (4) Axel Ljungström, Roussanka Loukanova, Peter LeFanu Lumsdaine, Reinhard Muskens (Editors): *Proceedings of the Symposium Logic and Algorithms in Computational Linguistics 2021 (LACompLing2021)*. Publisher: Stockholm University, 2021, DiVA Portal for Digital Publications. 2021. Identifiers: URN: urn:nbn:se:su:diva-200167 OAI: oai:DiVA.org:su-200167 DiVA, id: diva2:1623904
Permanent Link: <http://urn.kb.se/resolve?urn=urn:nbn:se:su:diva-200167>
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- (5) Loukanova, R. (Editor): *Natural Language Processing in Artificial Intelligence — NLP in AI 2021*. Book series Studies in Computational Intelligence book series (SCI), Volume 999. Publisher: Springer, Cham. Hardcover ISBN 978-3-030-90137-0. Softcover ISBN 978-3-030-90140-0. eBook ISBN 978-3-030-90138-7.
DOI <https://doi.org/10.1007/978-3-030-90138-7>
- (6) Loukanova, R. (Editor): *Natural Language Processing in Artificial Intelligence — NLP in AI 2020*. Book series Studies in Computational Intelligence book series (SCI), Volume 939. Publisher: Springer, Cham. Hardcover ISBN 978-3-030-63786-6. Softcover ISBN 978-3-030-63789-7. eBook ISBN 978-3-030-63787-3.
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- (7) González S.R., Machado, J.M., González-Briones, A., Wikarek, J., Loukanova, R., Katranas G., Casado-Vara, R. (Editors): *Distributed Computing and Artificial Intelligence. Volume 2: Special Sessions 18th International Conference*. DCAI'21. Series: Lecture Notes in Networks and Systems. Volume 332. 2022. Springer International Publishing. eBook ISBN 978-3-030-86887-1. DOI 10.1007/978-3-030-86887-1
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- (8) González, S.R., González-Briones, A., Gola, A., Katranas, G., Ricca, M., Loukanova, R., Prieto, J. (Editors): *Distributed Computing and Artificial Intelligence, Special Sessions, 17th International Conference*. DCAI 2020. Book series: Advances in Intelligent Systems and Computing. Springer, Cham. ISBN: 978-3-030-53828-6 DOI: 10.1007/978-3-030-53829-3
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- (9) Grabowski, A., Loukanova, R., Christoph Schwarzweller, Ch. (Editors): *AI Aspects in Reasoning, Languages, and Computation*. Book series: Studies in Computational Intelligence (SCI). 2020. (First Online: 01 October 2019) Volume 889. Springer International Publishing, Cham. ISBN 978-3-030-41424-5 ISBN 978-3-030-41425-2 (eBook)
<https://doi.org/10.1007/978-3-030-41425-2>
- (10) Loukanova, R. (Editor). *Logic and Algorithms in Computational Linguistics 2018 (LACompLing2018)*. 2020. Book series: Studies in Computational Intelligence (SCI). Volume 860. Springer International Publishing, Cham. ISBN 978-3-030-30077-7 (eBook) ISBN 978-3-030-30076-0 (Hardcover)
<https://doi.org/10.1007/978-3-030-30077-7>
- (11) *Journal of Logic, Language and Information*. Loukanova, R. and Moortgat, M. (Editors): Volume 28, Issue 2, June 2019 Special Issue: Logic and Algorithms in Computational Linguistics 2017. Springer Netherlands. ISSN: 0925-8531 (Print) 1572-9583 (Online)
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Loukanova, R. and Moortgat, M. : *Introduction*. In: Special Issue: Logic and Algorithms in Computational Linguistics 2017. *Journal of Logic, Language and Information*. June 2019, Volume 28, Issue 2, pp. 97–99. Springer Netherlands.
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- (14) Christiansen H., Jiménez-López, M.D., Loukanova, R., Moss, L.S. (Editors): *Partiality and Underspecification in Information, Languages, and Knowledge*. 2017. Cambridge Scholars Publishing. ISBN (13) 978-1-4438-7947-7; (10) 1-4438-7947-9
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