Achievements, CV, and List of Publications
J.A. Makowsky

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Current fields of research activity: Graph polynomials; Algorithms for graph invariants; Algorithms and descriptive complexity theory; complexity of real and algebraic computations

Past fields of research activity: Mathematical logic, Model theory; Design and theory of databases; Logic in computer science and AI and Logic programming.

Personal Data

Name: Johann Andreas Makowsky

Born: 1948, Budapest (Hungary)

Status: Married, two children

Citizenship: Swiss (Zurich), permanent resident status in Israel

Languages: German, French, English (fluent speaking and writing), Italian and Hebrew (good speaking, limited writing)

University Address: Department of Computer Science,
Technion–Israel Institute of Technology, 32000 Haifa, Israel

Private Address: Sderot Habroshim, 15 Apt. 15, 3448335 Haifa, Israel

Telephone: Israel: +972-4-833 3630 (Haifa), +972 54 755 7616 (mobile)
Switzerland: +44 78 739 0629 (mobile)

E-Mail: janos@cs.technion.ac.il, jmakowsky@bluewin.ch

World Wide Web: http://www.cs.technion.ac.il/∼janos

Wikipedia: https://en.wikipedia.org/wiki/Johann_Makowsky

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1 Major Achievements, Teaching and Research

1.1 Scientific recognition

The common thread in my research is *Model Theory*, a branch of mathematical logic dealing with the mathematical treatment of problems of semantics. From this I was led to do research also in Database Theory, Theory of Programming Languages and their Verification, Data Modeling and Software Engineering, and more recently, Algorithmic Graph Theory and Knot Theory.

Invited speaker at major conferences

In each of these fields I received international recognition, as invited speaker at the respective international conferences and workshops listed in my CV. I was plenary speaker at the

- Annual European Conference of the Association of Symbolic Logic (Logic Colloquium) twice
- Annual meeting of the European Association of Computer Science Logic (CSL) three times, last in 2012.
- Mathematical Foundations of Computer Science (MFCS)
- International Conference on Conceptual Modeling (ER)
- International Conference on Logic for Programming Artificial Intelligence and Reasoning (LPAR)
- Indian Conference on Logic and its Applications (ICLA)
- Computing in Europe (CiE)

For my 60th birthday in 2008 a special international workshop *Bridging Logic and Computer Science* was organized preceeding the Annual EACSL conference CSL'08 in Bertinoro, Italy, cf. `http://csl2008.cs.unibo.it/program.pdf`. A special issue of *Fundamenta Informaticae*, vol. 98 (2010), was published with some of the papers presented at this workshop.

Program and steering committees

I have served on many program committees of conferences in logic and its applications, and twice I was program committee co-chair: In 1995 for Annual European Meeting of the ASL (Logic Colloquium'95) in Haifa, and in 2003 for the Annual Meeting of the European Association of Computer Science Logic (EACSL) CSL'03 in Vienna. I also served (or still serve) on the Steering Committee of ESSLLI (European Summer School of Logic, Language and Information) and of LICS (IEEE Conference on Logic in Computer Science). I was also invited

together with M. Grohe to organize a *Joint Special Session* on *Model Theoretic Methods in Finite Combinatorics* at the Annual Joint AMS-ASL Meeting of 2009 (American Mathematical Society and Association of Symbolic Logic).

Editorial responsibilities

I have served (or still serve) on the editorial boards of

- *Archive for Mathematical Logic* (Guest editor),
- *Israel Journal of Mathematics* (Guest editor),
- *Elemente der Mathematik* (Guest editor)
- *Annals of Pure and Applied Logic* (Editor),
- *Methods of Logic in Computer Science* (Editor),
- *Journal of Applied Logic* (Area editor for mathematical logic),
- *Journal of Algorithms, in Cognition, Informatics and Logic* (Area editor for Algorithms in Logic and Decision Procedures),
- *Fundamenta Informaticae* (Editor),
- *Mathematical Logic Quarterly* (Editor),
- *Logical Methods in Computer Science* (Advisory Board).

International professional organizations

EACSL Presidency In 1992 I was among the founding members of the European Association of Computer Science Logic (EACSL) serving since then on its schientific council. In 2002 I was elected vice-president of EACSL. In 2004, upon the premature resignation of the president, I was elected its president (till 2009). Although I was asked to serve a second 5 year term, I stepped down to make place for younger people, I was reelected to the board for another 5 years.

During my presidency I have initiated the now well recognized **Ackermann Award**, and I have strengthened international cooperation between EACSL and other organizations dealing with Logic in Computer Science (LiCS, CiE, ESSLLI, Kurt Goedel Society and EATCS).

LICS Steering Committee Since 2004 I serve on the LICS Steering Committee as the delegate of EACSL.

Ackermann Award Jury In the capacity as the president of EACSL I served as the chairman of the Jury of the Ackermann Award, the EACSL Outstanding Dissertation Award for Logic in Computer Science.

Other Organizations From 1998-2010 I served for two terms on the board of DVMLG (Deutsch Vereining für Mathematische Logic), the Association of Logic in German speaking countries. During my terms I successfully pushed for the internationalization and modernization of DVMLG and initiated its involvement in publishing. I also served on the Council of the Association of Logic in India from 2007-2012.

1.2 Tenure offers from abroad

I joined the Technion Computer Science Department in 1980 as Senior Research Associate. In 1983 I was offered a tenured professorship (C3) at the Computer Science Department of the Technical University in Darmstadt (Germany), which I rejected when it became clear I would get a non-tenured associate professor position at the Technion. I was awarded tenure in 1987. After my divorce in 1987, I applied and in 1990 I was offered a chair (C4) for Methods of AI at the Computer Science Department of the Technical University of Berlin (Germany), which I rejected in 1990, after it became clear that the changed political and economical situation of united Berlin would make the Technical University into a different place than I had imagined when I applied.

1.3 Comments on selected papers

My research interests include Model Theory (Classical Model Theory, Abstract Model Theory, Finite Model Theory), Semantics of Programming Languages (Database Theory, Program Verification, Logic Programming), Logic and Complexity, and more recently Applications of Logic to Graph Theory, Knot Theory and Combinatorics. In each of these areas I made significant contributions.

Model Theory

My work of 1971-1974 in classical model theory, 1, is referenced in the two major monographs by C.C. Chang and J. Keisler (Model Theory, 3rd edition 1991) and W. Hodges (Model Theory, 1993) and the more specialized monographs by B. Zil'ber (Uncountable Categorical Theories, 1993). The book of M. G. Peretyat'kin (Finitely Axiomatizable Theories, 1997) develops a rich theory of work done by the author between 1982 and 1993 which was initiated by my Master Thesis of 1971. In P. Rothmaler's Monograph (Introduction to Model Theory, 2000) a whole chapter is devoted to my results of 1971. After my early success in classical Model Theory I spent twice six months in Warsaw, and, under the influence of W. Marek and A. Mostowwski, I turned to Abstract Model Theory.

Abstract Model Theory and Abstract Elementary Classes

My PhD theses marked the beginning of my work in Abstract Model Theory. My papers in abstract model theory (1973-1984) are widely referenced. The multi-author monograph 'Model Theoretic Logics' (J. Barwise and S. Feferman eds., 1985) gives best testimony for this: Besides my own three chapters (one with D. Mundici), many other chapters quote my work. In chapter 18, 1, I present (ca. 80 pages) S. Shelah's and my own contribution to the field. In chapter 20, 3 I gave the first published presentation of S. Shelah's then unpolished results on "Abstract embedding relations". Both chapters also contain relevant original contributions to the field obtained before 1982.

It should be noted that later S. Shelah and R. Grossberg renamed the *"Abstract embedding relations"* into *"Abstract Elementary Classes"* and, due to this, Shelah's and my pioneering work from before 1982 was often overlooked.

Database Theory

Between 1978-1980, while visiting the Heberew University, I started to work with Catriel Beeri on the foundations of database theory. Due to my appointment at the Technion–Israel Institute of Technology in the Department of Computer Science, I abandoned my work in Abstract Model Theory.

As a result of my work with Catriel Beeri, mostly unpublished, C. Beeri and M. Vardi picked up many themes I had discussed with C. Beeri before. However, I was the first to define a framework for database dependencies, and to prove undecidability results in this framework. My contributions to *Database Theory* (1980-1995) are referenced in most of the recent Database Theory monographs, but most prominently in the monographs by Ullman, by Abiteboul, Hull and Vianu (Foundations of Databases, 1995), by Mannila and Räihä (The Design of Relational databases, 1992), by M. Levene and G. Loizou (A Guided Tour of Relational Databases and Beyond), and by B. Thalheim (Fundamentals in Entity-Relationship Modelling, 2000). Three contributions in Database Theory had considerable impact. In my paper with A. Chandra and H. Lewis (1980) we gave the first complexity analysis in the emerging field of database dependencies; in my papers with E. Dahlhaus (1985) we anticipated the emerging field of complex databases and clarified the notion of computable queries over hereditary finite structures; and in my papers with V. Markovits and N. Rotics we contributed to the mathematical foundations of the Entity–Relationship Model. More recently, together with E. Ravve, I returned to the study of the foundations of database design. For this work I was invited to hold a key note address at the 15th International Conference on Conceptual Modeling in 1996. In 2012 I returned to work with E. Ravve and we laid the proper foundations for the role of Boyce-Codd normalform in database design.

The most important papers in this line of research are 81, 83, 93, 95, 22, 32, 157. The papers 81, 22, have over 100 Google citations.

Satisfiability and Logic Programming

My paper *Why Horn formulas matter in computer science* addressed the question why Horn formulas (a special class of first order formulas) play a prominent role both in Database Dependencies and in Logic Programming. The paper gives a semantic characterization of Horn formulas (and some generalizations thereof) which explained to a large extent why Negation by Failure has a simple semantics in Logic Programming when restricted to Horn formulas. In another paper with A. Itai, we were the first to show that propositional Horn formulas have a linear satisfiability problem. My paper with A. Sharell *On Average Case Complexity of* **SAT** *for Symmetric Distributions* explains to a large extent why **SAT** can be solved efficiently on the average and was discussed prominently in the historic survey by S. Cook and D. Mitchell *Finding Hard Instances of the Satisfiability Problem: A survey* (DIMACS Series vol. 35, 1997).

The most important papers in this line of research are 18, 19, 45, 27, where the first three have over 100 Google citations.

Finite Model Theory

In 1994, I returned to the theory of generalized quantifiers in the context of *Finite Model Theory and its interaction with Complexity Theory.* Together with Y. Bargury, A. Calò, B. Courcelle, M. Frick, Y. Pnueli and U. Rotics I wrote eleven papers investigating the expressive power of fragments of second order logic and their relationship to complexity classes. I was invited twice (1997, 1999) to give an advanced summer course on these topics at the European Summer School in Logic, Language and Information (ESSLLI). Some of this recent work is already referenced in the monographs of N. Immerman (Descriptive Complexity, 1998) and L. Libkin (Elements of Finite Model Theory, 2004).

The most important papers in this line of research are

Clique-width and the Algorithmic Use of Structural Graph Theory

Starting in 1995 I started to work on graph algorithms and on exploiting the fact that many artefact structures have low clique width. With B. Courcelle, E. Fischer, M. Lotz, J. Mariño, K. Meer, E. Ravve and U. Rotics, I have written papers showing that on structures of bounded clique width polynomial time algorithms can be found to compute graph polynomials, knot polynomials and the characteristic polynomial of SAT. Alone, I have put this phenomenon into the larger context of a very general version of the Feferman-Vaught Theorem. This work (over 50 pages) appeared in the special issue of the Annals of Pure and Applied Logic dedicated to A. Tarski's centennary, 41, with over 250 Google citations. I was also the first to show that this technique can be extended to compute the Jones polynomial in knot theory, 43, 37.

I was invited to present this result in 2003 at the three week mini-semester "Knots in Poland" and my paper with M. Lotz appeared in the special issue of

Advances in Applied Mathematics on the Tutte polynomial. My papers with Courcelle and Rotics, published around 2000, 34, 35, has by now advanced to be my most quoted paper with over 850, respectively over 250 Google citations. I was invited to give mini-courses on these results in Bordeaux in 2001, at BRICS Summer School also in 2001 and at the European Summer School in Logic, Language and Information (ESSLLI) in 2003.

The most important papers in this line of research are 30, 33, 122, 36, 39, 40, 45. Surprisingly, there was also a paper applying these methods to quantum computations, which shows that quantum FFT can be classically simulated, 44, which had so far 39 Google citations.

Towards a general theory of Graph Polynomials

My work since 2003 deals with the development of a general theory of graph polynomials (including knot polynomials) and their complexity. I was the first to show that the knot invariant called the Jones polynomials is Fixed Parameter Tractable for knot diagrams of tree-width k, 43, with further results in 38.

I have worked in this field with M. Blaeser, H. Dell, P. Tittmann (Germany), A. Goodall, S. Noble and B. Zilber (Great Britain), and M. Hermann (France), E.V. Ravve (Israel), and my graduate students I. Averbouch, B. Godlin, and T. Kotek, and more recently with V. Rakita. I have outlined a research program in my paper *From a zoo to a zoology: towards a general theory of graph polynomials* 47, and I have received an ISF-grant (2007-2010) for this project. The most relevant papers within this program are 50, 51, 160, 69, 71,

Complexity issues of graph polynomials are treated in 151, 40, 49, 66, 164,

The Joint Special Session at the AMS-ASL Meeting of 2009 January 5-8, 2009, Washington, D.C., on Model Theoretic Methods in Finite Combinatorics was largely dedicated to this project and its ramifications. Articles emanating from this Special Session did appear in December 2011 as a book in the prestigious series of the American Mathematical Society *Contemporary Mathematics, vol. 558* under the same title, edited by M. Grohe and myself.

In the 12 journal papers 37-40, 43, 46, 48-51, 53-54, the two book chapters 14-15, and the 14 conference papers 41-44, 47-56 I developed with my co-authors a general theory of graph polynomials. This work is widely acclaimed and in the last few years I was invited to several international conferences and workshops in combinatorics, model theory and logic in computer science to present this work (CiE'2008, ICLA'2009, WoLLIC'2010, FoCM'2011, 12th Asian Logic Conference 2011, CIRM 2008, Bedlevo 2009, AlMoTh'2009, Hranice Castle 2009, Dagstuhl 2010 from the list in my CV).

With my collaborators we have managed to create a new field in graph theory with two Dagstuhl Seminars, two Special sessions at AMS meetings and one SIAM minisymposium.

2009 AMS-ASL Special Session on Model Theoretic Methods in Finite Combinatorics,
January 2009, Washington DC,
Organizers: M. Grohe and J.A. Makowsky

2014 SIAM Conference on Discrete Mathematics, Minneapolis, June 2014
Minisymposium: Graph Polynomials: Towards a General Theory
Organizers: Jo Ellis-Monaghan, Andrew Goodall and J.A. Makowsky

2016 Dagstuhl Seminar 16241
Graph Polynomials: Towards a Comparative Theory
Organizers:
Jo Ellis-Monaghan, Andrew Goodall, Johann A. Makowsky, Iain Moffatt

2019 Dagstuhl Seminar 19401
Comparative Theory for Graph Polynomials
Organizers:
Jo Ellis-Monaghan, Andrew Goodall, Iain Moffatt, Kerri Morgan

2022 Special Session on
Graph and Matroid Polynomials: Towards a Comparative Theory
AMS-SMF-EMS Joint International Meeting, Grenoble, France, July 2022
Organizers: E.Gion, J.A.Makowsky and J.Oxley

Recurrence Relations for Combinatorial Functions

Starting with open problems in the work of C. Blatter and E. Specker from 1984[1], I got interested in combinatorial functions and their linear recurrence relations (C-finite sequences) and modular linear recurrence relations (MC-finite sequences). The papers 121, 53 and 73 gradually solve all the open problems from their paper. In 57 and 59 we study variations on holonomic sequences based on lattice paths, in 154 and 62 we study recurrence relations for graph polynomials. An obituary and hommage to E. Specker can be found in 55.

Varia

My remaining papers document my various involvement and interest in questions of algorithmics, non-monotonic logics, program and hardware verification, and software engineering, as a result of collaboration with graduate students or colleagues, or as a reaction to my own reading, but they do not represent long term involvement in their respective research areas.

[1] Blatter, Chr, and Ernst Specker. "Recurrence relations for the number of labeled structures on a finite set." Logic and Machines: Decision Problems and Complexity: Proceedings of the Symposium Rekursive Kombinatorik held from May 2328, 1983 at the Institut fr Mathematische Logik und Grundlagenforschung der Universitt Mnster/Westfalen. Springer Berlin Heidelberg, 1984.

1.4 Industrial achievements

mental images

In 1985 I was instrumental, as the chief scientific consultant, in the foundation of mental images GmbH, Berlin. This company is by now Europe's leading firm in the development of software related to computer graphics and animation. Virtually all high-end 3D graphic packages offer its MENTAL RAY as their top rendering option.

Until December 2007 I was still acting as a scientific consultant to mental images and have also been involved, in the past, in various decision making processes on the management level. In 2007 mental images was sold to NVIDIA.

The homepage of mental images can be found at www.mentalimages.com.

mental images was the first company from abroad to join the Industrial Affiliates Program of the faculty of CS at the Technion.

ZURICH

In 1988-1990 I prepared a feasibility study for ZURICH Insurances (ZURICH FINANCIAL SERVICES) about the *Insurability of software related risks.*

Finanz & Wirtschaft

In 1987-1988 I was a columnist in the reknown financial newspaper Finanz & Wirtschaft, published in Zurich in German. I published a monthly column on computing related issues.

2 Curriculum Vitae

2.1 Academic degrees

Diplom M.Sc. in Mathematics and Physics (Diplom),ETH-Zurich, 1971

Dr.Sc.Math. Ph.D. Mathematics, ETH-Zurich, 1974

Dr.habil. Habilitation Mathematics (Privatdozent), FU-Berlin, 1981

2.2 Academic appointments

Present position, since 2001: Full Professor, Department of Computer Science, Technion–Israel Institute of Technology, Haifa, Israel

Previous positions:

- Associate Professor, Department of Computer Science, Technion- Israel Institute of Technology, Haifa, israel, 1984-2001
- Chair for Methods of Artificial Intelligence (C4), Department of Computer Science, Technical University Berlin, West Berlin (Tenured appointment 1990, declined after negociations).
- Associate Professor of Theoretical Computer Science (C3), Department of Computer Science, Technical University Darmstadt, FRG, (Tenured appointment 1984, declined after negociations).
- Senior Research Associate, Department of Computer Science, Technion-Israel Institute of Technology, Haifa, Israel, 1980-1984.
- Assistant Professor (C1, Wissenschaftlicher Assistent), 2.Mathematisches Institut, FU- Berlin, West Berlin, 1975-1980.
- Assistant, ETH-Zurich, (Mathematics and Engineering), 1970-1974.

Visiting positions (a selection):

2014 EMCL-Lecturer, Computer Science Department, Technical University Vienna (Sabbatical from the Technion)

2004 Visiting Professor, Department of Mathematics, ETH-Zurich, Switzerland (Sabbatical from the Technion).

2000 Visiting Professor, Ecole doctorale de math'ematiques et informatique de Bordeaux, Bordeaux, France

2000 Visiting Professor, The Fields Institute, Toronto, Canada

1999 Distinguished Professor at the Institut Universitaire de France, stay at LaBRI, Bordeaux, France

1999-2000 Visiting Professor, Department of Mathematics, ETH-Zurich, Switzerland (Sabbatical from the Technion).

1999 Visiting Professor, Institut für Informationssysteme, Technical University, Vienna, Austria (Sabbatical from the Technion, 1999).

1993-94 Visiting Professor, Department of Applied Mathematics, Bern University, Switzerland (Sabbatical 1993-94).

1987-88 Visiting Professor, Department of Mathematics, University of Lausanne, Switzerland (leave of absence from the Technion, 1987/88).

1984-85 Visiting Professor, Department of Computer Science, ETH-Zurich, Switzerland (Sabbatical from the Technion, 1984/85).

1976-81 Research Fellow, Department of Mathematics and Einstein Institute of Advanced Studies, The Hebrew University Jerusalem, 1976, 1977/78, 1980/81.

1983-94 Research Fellow, Forschungsinstitut für Mathematik, ETH-Zurich, 1983, 1985, 1986, 1994.

1980 Research Fellow, Computer Science Department, MIT, Cambridge, MA

1973-74 Visiting Assistant Professor, Philosophy Department, Stanford University

1972-73 Research Fellow, International Mathematical Center *Stefan Banach*, Warsaw (Poland)

2.3 Research interests

Mathematical Logic, Combinatorial Counting, Graph and Knot Polynomials, Algorithms and Descriptive Complexity Theory, Logic in Computer Science and AI, Database Theory.

2.4 Public professional activities

Academic activities

2007-2009 Academic Head of the Department of Computer Science and Information Technology, Mar Elias College. In this unpaid position, I was responsible for the submission of the academic program to MALAG to gain official recognition of this institution.

Editorial responsibilities

1980 Archiv füer Mathematische Logik, Guest editor of special issue.

1990-1995 Methods of Logic in Computer Science, Member of editorial board.

1983-1987 Annals of Pure and Applied Logic (APAL), Advisory editor.

1992-2000 Annals of Pure and Applied Logic (APAL), Advisory editor.

2003-current Journal of Applied Logic (JAL), Area editor for Mathematical Logic.

2005-2015 Logical Methods in Computer Science, Member of the advisory board.

2009-current Journal of Algorithms in Cognition, Informatics and Logic, Area editor for Algorithms in Logic and Decision Procedures

2010-current Fundamenta Informaticae, Member of the Editorial Board.

2010-current Mathematical Logic Quarterly, Member of the Editorial Board.

International Professional Organizations

1992-1998 Founding member of the *European Association for Computer Science Logic (EACSL)*. Member of the Scientific Council 1992-1997, re-elected 1997.

1998-2003 Elected member of the Executive Council of the *European Association for Computer Science Logic (EACSL)*.

1998-2010 Elected member (two terms) of the Executive Council of the *German Association for Mathematical Logic and for Foundations of Exact Sciences (DVMLG)*.

2002-2004 Elected Vice-president of the Executive Council of the *European Association for Computer Science Logic (EACSL)*.

2004-2009 Elected President of the Executive Council of the *European Association for Computer Science Logic (EACSL)*.

2007-2009 Member of the ESSLLI (European Summer School of Logic, Language and Information) Standing Committee of FOLLI (the Association of Logic, Language and Information). This Standing Committee is responsible for the long-term continuity of the ESSLLI summer school: it selects hosting sites, and installs and monitors the PC's and local organizing committees for the annual installments.

2005-2010 President of the Jury of the ACKERMANN AWARD, Distinguished PhD Award of the EACSL.

2010-13 Member of the Executive Council of the *European Association for Computer Science Logic (EACSL).*

2004-13 Member of the board of LICS (IEEE conferences on Logic in Computer Science)

2013-current Member of the ESSLLI (European Summer School of Logic, Language and Information) Standing Committee of FOLLI (the Association of Logic, Language and Information).

Organizing and Program Committees of International Conferences

2013 Member of the Program committee of the 5th Indian conference on Logic and Applications (ICLA), to be held in Chennai, India, 10th-12th January 2013.

2011 Member of the Program committee of WoLLIC'2011, Workshop on Logic, Language, Information and Computation, Philadelphia, Pennsylvania, May 18-21, 2011

2010 Member of the Program committee of the Colloquium in honour of Ernst Specker on the occasion of his 90th Birthday, Forschungsinstitut für Mathematik, ETH Zurich, October 2010

2010 Member of the Program committee of Colloquium Logicum, Biannual meeting of the DVMLG, Münster, Germany, September 2010.

2010 Member of the Program committee of "Logical Approaches to Barriers in Computing and Complexity", Greifswald, Germany, February 14-17, 2010.

2009 Co-organizer of Joint Special Session at the AMS-ASL Meeting of 2009 January 5-8, 2009, Washington, D.C. on "Model Theoretic Methods in Finite Combinatorics"

2009 Member of the Program committee of 6th Annual Conference on Theory and Applications of Models of Computation (TAMC 2009), Changsha, China

2008 Member of the Program committee of 5th Annual Conference on Theory and Applications of Models of Computation (TAMC 2008), Xi'an, China

2007 Member of the Program committee of ER'07 (Entity Relationship Modeling), Auckland, New Zealand, November 2007.

2007 Member of the Program committee of CiE'2007 (Computability in Europe Modeling), Siena, Italy, June 2007.

2006 Member of the Program committee of CSR'06 (Computer Science in Russia, Theory Track), St. Petersburg, Russian federation, June 2006

2004 Member of the Program committee of CSL'04 (Annual meeting of the EACSL), Worclaw, Poland, September 2004

2003 Member of the Program committee of Kalmar'03, Szeged, Hungary, October 2003

2003 Co-chairman of the Program committee of CSL'03 (Annual meeting of the EACSL), Vienna, Austria, September 2003

2002 Member of the Program committee of CSL'02 (Annual meeting of the EACSL), Edinburgh, Scotland, September 2002

2002 Member of the Program committee of LiCS'02, Copenhagen, Denmark, July 2002

2001 Member of the Program committee of CSL'01 (Annual meeting of the EACSL), Paris, France, September 2001

2001 Member of the program committee of MFCS'01 (mathematical Foundations of Computer Science), Prague, Czech Republic, August 2001.

2000 Member of the program committee of *Logic and Complexity*, An International Symposium in honor of the 150th birthday of Erwin Engeler + Ernst Specker, February 14-16 2000, Schloss Münchenwiler, Murten, Switzerland

1999 Member of the program committee of ICALP'99, Prague, Czech Republic, July 1999.

1997 Member of the program committee of LFCS'97 (Logical Foundations of Computer Science), held in Yaroslavl, Russia, in July 1997.

1994-1995: Chairman of the organizing committee and *coordinator* of the program committes for the Logic Colloquium 95 in Israel, the *Annual European Summer Meeting of the Association of Symbolic Logic*.

1992: Program committee, Italian–Israeli Symposium in AI and Computational Linguistics, September 1992, organized by the Israeli Ministry of Science.

National Committees

1992-1995 Member of the National Subcommittee for Computerization (Va'adat Michshuv of Vatat)

1994-1996 Member of the Professional Committee of the National Academy of Sciences, Section Computer Science.

Membership in Professional Organizations
Association of Symbolic Logic, Polish Association of Logic and Philosophy of Science, European Association for Computer Science Logic, Deutsche Vereinigung für Mathematische Logik Und Grundlagen der Mathematik; Israeli Mathematical Society, Swiss Mathematical Society, American Mathematical Society.

2.5 Selected invited addresses at major international conferences

2013 Dagstuhl seminar on *Automated Reasoning on Conceptual Schemas*, Schloss Dagstuhl (Germany), May 2013.

2013 Dagstuhl seminar on *Bidimensional Structures: Algorithms, Combinatorics and Logic*, Schloss Dagstuhl (Germany), March 2013.

2013 Dagstuhl seminar on *Computational Counting*, Schloss Dagstuhl (Germany), January 2013.

2012 Keynote speaker, *CSL'2012 (Computer Science Logic)*, Fontainebleau, France, September 2012

2011 Special Session Speaker at the *Twelfth Asian Logic Conference*, New Zealand, December 2011

2011 Retiring Presidental Address. *CSL'2011 (Computer Science Logic)*, Bergen Norway, September 2011

2011 Special Session Speaker at the "Real Number Complexity", Workshop at *FoCM'11 (Foundations of Computational Mathematics)*, Budapest, Hungary, July 2011

2010 Dagstuhl seminar on *Computational Counting*, Schloss Dagstuhl (Germany), November 2010.

2010 Workshop in Honour of Y. Gurevich at *MFCS'2010 (Mathematical Fondations of Computer Science)*, Brno, Czech Republic, August 2010.

2010 Special Session Speaker at the "Logic, Combinatorics and Computation", Workshop at *CSL'2010 (Computer Science Logic)*, Brno, Czech Republic, August 2010.

2010 Keynote speaker and tutorial speaker at *WoLLIC'2010 (17th Workshop on Logic, Language, Information and Computation)*, Brasilia, Brazil, July 2010

2010 Public Lecture at *Logical Approaches to Barriers in Computing and Complexity*, Greifswald, Germany, February 2010.

2010 Conference in Honour of E. Engeler, Bern, Switzerland, February 2010.

2009 AlMoTh'2009 , Algorithmic Model Theory, Dortmund (Germany), February, 2009.

2009 ESF Mathematics Conference in Partnership with EMS and ERCOM on Model Theory, Mathematical Research and Conference Center, Bedlewo, Poland, August 2009.

2009 Workshop on Limits, organized by L. Lovasz, J. Nesetril and L. Schrijver, Hranicni zamecek, Czech Republic, January, 2009

2009 DIMAP workshop on Algorithmic Graph Theory, Warwick, Great Britain, March 2009

2009 Plenary speaker, ICLA'2009, *Third Indian Conference on Logic and its Applications*, Chennai, India, January 2009

2008 Graph Decomposition, Theory, Logics and Algorithms, C.I.R.M. (Centre International de Rencontres Mathematiques) in Marseille-Luminy (France) April, 2008.

2008 Special Session speaker on "Teaching Logic for Computer Science" at CSR'2008, Moscow, Russian Federation

2008 Plenary speaker, CiE'2008 (Computing in Europe), Athens, Greece, June 2008

2007 Special Session speaker on the occasion of R. Parikh's 70th birthday at *Second Indian Conference on Logic and its Applications*, Mumbay, India, January 2007

2007 Plenary speaker, LPPAR'2007 (14th International Conference on Logic for Programming Artificial Intelligence and Reasoning), Yerewan, Armenia, October 2007

1996 Plenary speaker, *Conceptual Modeling - ER'96*, 15th International Conference on Conceptual Modeling, Cottbus, Germany, October 1996.

1997 Plenary speaker, *SOFSEM'97*, XXIV-th Seminar on Current Trends in Theory and Practice of Informatics November 22 - November 29, 1997, Milovy, Czech Republic.

1994 Plenary speaker, *Mathematical Foundations of Computer Science, MFCS'94*, Kosice (Slovakia) 1994,

1991 Plenary speaker, *Computer Science Logic '91*, Bern 1991

1991 *Logic Colloquium'91* (Annual European Summer Meeting of the ASL in conjunction with 9th International Congress of Logic, Methodology and Philosophy of Science), Section Logic and Computer Science, Uppsala 1991

1982 Plenary speaker, *Logic Colloquium'82* (Annual European Summer Meeting of the ASL), Florence, Italy.

1979 *Spring Meeting of the American Mathematical Society*, Hawaii, USA. Special Session: Countable model theory.

1977 Plenary speaker, *Logic Colloquium'77* (Annual European Summer Meeting of the ASL), Wroclaw, Poland.

1976 Plenary speaker, *Fourth Scandinivian Logic Symposium* (1976), Jyvaskyla, Finland

2.6 Graduate students

Ph.D. Theses

1. Definable queries and a completion of QBE.
   A.Zvieli, Ph.D. Thesis , completed January 1984, Technion Haifa.

2. Extensions of propositional dynamic logics.
   M. Tiomkin, Ph.D. Thesis, completed February 1984, Technion Haifa.
   Published as Journal publications 14 and 23.

3. Entity-Relationship Consistency for the Relational Model,
   Victor M.Markowitz, Ph.D.Thesis, completed summer 1987, Technion Haifa.
   Published as Conference publication 96, 93, 95 and Journal publication 22.

4. Using structural information for managing very large software systems,
   Yoelle S. Maarek, Ph.D. Thesis (completed with Prof. D. Berry),
   completed January 1989.

5. A protocol for man-machine interfaces,
   Jacob Ukelson, Ph.D. Thesis (started with Dr. M. Rodeh),
   completed Spring 1989. Published as Journal publication. 26.

6. Une architecture pour commande numerique de machine-outil,
   Jean-Charles Gregoire, Ph.D Thesis at the Swiss Federal Institute of Technology in Lausanne (co-advised with Prof. Henri Nussbaumer), completed in Summer 1989. Publication in conference 101.

7. Classes of graphs where NP problems become polynomial,
   U. Rotics, Ph.D. Thesis (Complete Spring 1999)
   Technical report no. 784 (J. A. Makowsky and U. Rotics: Optimal Spanners in Partial k-Trees) and 843 (J. A. Makowsky and U. Rotics: The T-spanner problem is NP-complete on chordal graphs). Journal publication 30, Conference publication 112, submitted to Journals 34, 35, 33.

8. Application of translation schemes to decomposability of problems.
   E.V. Ravve, Ph.D. Thesis (Complete Spring 1999)
   Journal publication 32, Conference publication 107.

9. On the complexity of Schur functions over finite fields,
   G. Kogan, Ph.D. Thesis (Candidacy examination passed Summer 1997, student dropped out).

10. Completeness and Universaility Properties of Graph Invariants and Graph Polynomials
    I. Averbouch, Ph.D. Thesis (Completed January 2011)
    Journal publication 50,51, Conference publication 122,125,130.

11. Definability of Combinatorial Functions
    T. Kotek, Ph.D. Thesis (Completed May 2012)
    Journal publication 59, 52, 57, 134, Conference publication 126,127.
    Publication in collections 159,160.

12. Harary polynomials and generating graph polynomials
    V. Rakita, Ph.D. Thesis (to be completed in May 2023)
    71, 75, 74.

M.Sc. Theses

13. The model theory of L^{pos}.
    Gert Herrgott, M.Sc. Thesis in Mathematics (co-advised with Prof. W. Rautenberg), Department of Mathematics, Free University, Westberlin, 1979.

14. Concrete lower bounds for regular resolution.
    Michael Mötz, M.Sc. Thesis in Mathematics (co-advised with Prof. W. Rautenberg and Dr. D. Giorgetta), Department of Mathematics, Free University, Westberlin, 1982.

15. On formal semantics of data bases
    Naphtali Rishe, M.Sc. Thesis (started with N. Francez), completed in Summer 1981, Technion Haifa.

16. A Unifying Approach to the Entity-Relationship and the Relational Models of Data Bases.
    N.Rotics, M.Sc. Thesis, completed in Summer 1984, Technion Haifa.
    Published as Conference Publication 93.

17. MUSICIAN, A Music Processing and Synthesis System,
    A.Ban, M.Sc. Thesis, completed November 1985, Technion Haifa.
    Published as Conference Publication 94.

18. DB-MASTER, an interactive design tool for data base schemes,
    Alain Azagoury, M.Sc. Thesis, completed summer 1987.

19. The expressive power of transitive closure,
    Arie Calò, M.Sc.Thesis, completed spring 1990.
    Published as Conference publication 99.

20. Learning algorithms for connection machines,
    Yiphat Weissberg, M.Sc.Thesis (started with Dr. S. Porat), completed summer 1990.

21. Program testing methodologies,
    Moshe Zvi Rupp, M.Sc. Thesis (started with Dr. I. Pomeranz), completed winter 1991.
    Technical report no. CS9218. (M.Z. Rupp, J.A. Makowsky, and I. Pomeranz: Adequate Test Sets for Loop Testing)

22. The expressive power of transitive closure and 2–way multihead automata,
    Yaniv Bargury, M.Sc. Thesis, completed spring 1992.
    Published as Conference publication 98.

23. On the average complexity of SAT for flat distributions,
    Avy Sharell, M.Sc. Thesis, completed spring 1993.
    Published as Journal publication. 27 and Technical report No. 746.
    (A. Sharell and J. Makowsky: Probabilistic Lower Bounds for Average Case Complexity)

24. Updates and queries for Complex Objects,
    Reuven Asher Hasson, M.Sc. Thesis, completed summer 1992.
    Published as Conference publication 100.

25. Model checking for various products of structures
    Elena Ravve (Mouratova), M.Sc. Thesis, completed December 1994.
    Published as Conference publication 107.

26. Dynamic task allocation in parallel ray tracing,
Irene Notkin, M.Sc. Thesis (completed with C. Gotsman due to sabbatical), completed January 1995.

27. Dynamic memory allocation in parallel ray tracing,
Boris Farizon, M.Sc. Thesis (transferred to A. Itai due to sabbatical), completed October 1995.

28. On the algebraic complexity of some families of coloured Tutte polynomials,
Martin Lotz, M.Sc. Thesis (Department of Mathematics, ETH Zurich), completed March 2001.

29. NC Grammars and Clique Width,
Alex Glikson, M.Sc. Thesis, completed 2003
Conference publication 120

30. BSS Model of Computation over the Reals and Choice Operator,
Yonit Magid, M.Sc., completed 2007

31. Structural Properties of Formulas for which SAT Problem is Easy,
Avi Magid, M.Sc. Thesis, completed 2008

32. Definability and Hankel Matrices.
Nadia Labai, M.Sc. Thesis, completed 2015. Publications: 137, 139, 140, 142, 143, 161.

33. On Weakly Distinguishing Graph Polynomials.
Vsevolod Rakita, M.Sc. Thesis, completed 2020. Conference publication 148, Journal Publication 70.

3 Research grants

Submitted but not granted funding

2012-2015 ISF-1163/12 (Dichotomy Theorems for the Complexity of Counting Functions and Graph Polynomials)

2012-2015 GIF-5/11 (Limits of Algorithmic Meta-Theorems), with Martin Grohe, Berlin

Funded

None

Submitted in 2015, Pending

2015 Personal research grant: ISF 1145/16 for 2016-2019 (4 years): Graph polynomials: towards a comparative theory

2015 Israel-Singapore Cooperation grant:: ISF 2497/16 for 2016-18 (3 years): Generalized graph colorings and chromaticity

3.1 Research grants

2007-2011 Research project: Model theoretic Methods in Combinatorics, sponsored by the Israeli Science Foundation (ca. 150'000 US$).

1995-1998: Research project: Definability and Computability over Finite Structures (together with E. Grädel, Technical University Aachen), sponsored by German Israeli Foundation GIF with 247'000 DM.

1993-1994: Research project: Second Order Graph Properties and Model Checking (together with B. Courcelle and A. Arnold, University of Bordeaux), sponsored by the French–Israeli Binational Foundation ca. 15'000 US$.

1987–1992 Research project: Intelligent Systems and Robotics (together with Proff. F. Bruckstein, M. Heymann, A. Itai, Y. Zeevi and Dr. G.Silbermann), funded by VATAT (ca. US$ 250'000.-) and the MOKED. (ca. US$ 100'000).

1987: Research project: Application of Logic Programming to Data Base Design Problems, Funded by KEREN EMET (ca. US$ 20'000.-).

1984–1987: Research project *Notation in Electronic Music* (In collaboration with Prof. J. Tal , Jersualem, Dr. U. Shimony, Department of EE at the Technion and Prof. E. Maronn, Musikhochschule Hamburg), sponsored by the Volkswagen Foundation, Federal Republic of Germany. with 350 000 DM.

1980–1982: Recipient of a two year research fellowship from the Swiss National Science Foundation for the project: 'Abstrakte Modelltheorie und modelltheoretische Methoden in der theoretischen Informatik, insbesondere in algorithmischer Logik' (Abstract model theory and model theoretic methods in theoretical computer science, especially algorithmic logic). Amount 80'000 Sfr.

4 List of Publications

4.1 Theses

1. Kategorizität und endlich Axiomatisierbarkeit, Master Thesis, Department of Mathematics, ETH-Zurich 1971
   Published as journal papers in mathematical logic no. 1 and 3.

2. Δ -logics and generalized quantifiers, Ph.D. Thesis (Diss.Nr.5301) Department of Mathematics, ETH-Zurich, 1974
   Published as journal paper in mathematical logic no. 2 and conference paper no. 76.

3. Habilitation on the basis of the journal papers in mathematical logic no. 7–12 and the conference papers no. 2–4, Freie Universität Berlin, 1981.

4.2 Books and Lecture Notes

1. J.A.Makowsky, Compactness, Embeddings and Definability, Chapter 18 in "Model Theoretic Logics", J.Barwise and S.Feferman ed., Springer 1985, pp.645-716.

2. J.A.Makowsky and D. Mundici, Abstract Equivalence Relations, Chapter 19 in "Model Theoretic Logics", J.Barwise and S.Feferman ed., Springer 1985, pp.717-746.

3. J.A.Makowsky, Abstract Embedding Relations, Chapter 20 in "Model Theoretic Logics", J.Barwise and S.Feferman ed., Springer 1985, pp.747-791.

4. J.A. Makowsky, Logic for Computer Science (Technion Course 234292), 92 pp., reprinted and augmented annualy since 1988, last edition 1997

5. J.A.Makowsky, Model Theory and Computer Science: An Appetizer, Chapter I.6 in the "Handbook of Logic in Computer Science, vol. 1 (Background: Mathematical structures)", S. Abramsky, D.M. Gabbay, T.S.E. Maibaum eds., Oxford University Press, 1992, pp. 763-814.

6. J.A. Makowsky and Y.B. Pnueli, Computable Quantifiers and Logics over Finite Structures, in "Quantifiers: Logics, Models and Computation, Volume I", M. Krynicki, M. Mostowski and L.W. Szczerba eds., Kluwer Academic Publishers, 1995, pp. 313-357.

7. J.A. Makowsky, Translations, Interpretations and Reductions, Course given at ESSLLI'97, Aix-en-Provence, France, August 12-22, 1997 by J.A. Makowsky (assisted by E. Ravve), 280 slides.

8. J.A. Makowsky and E.V. Ravve (editors), Logic Colloquium '95, Proceedings of the 1995 Annual European Summer Meeting of the Association of Symbolic Logic, Haifa, August 1995, Lecture Notes in Logic, vol. 11, Springer Verlag, 1998 348 + xvi pp.

9. J.A. Makowsky, Introduction to Database Systems (Technion Course 236363), Lecture Notes in Hebrew by Gily Leshed and supplemented by Ofer Dubrovsky, Technion 1998.
   Second revised edition prepared by Z. Nevo and J.A. Makowsky, Technion 2001.

10. J.A. Makowsky, Logical Aspects of Combinatorial Algorithms, Course given at ESSLLI'99, Utrecht, The Netherlands, August 12-22, 1999 by J.A. Makowsky (assisted by U. Rotics), 180 slides.

11. J.A. Makowsky, Logical Methods in Combinatorial Computations, Course given at ESSLLI'03, Vienna, Austria, August 18-28, 2003 by J.A. Makowsky (assisted by E. Ravve), ca. 180 slides.

12. M. Baaz and J.A. Makowsky (editors), Computer Science Logic, Proceedings of the 17th International Workshop CSL 2003, of the 12th Annual Conference of the EACSL and the 8th Kurt Gödel Colloquium KGC 2003, Vienna, August 2003, LNCS 2803.

13. M. Grohe and J.A. Makowsky (editors), Model Theoretic Methods in Finite Combinatorics, Contemporary Mathematics, vol 558, American Mathematical Society, 2011.

14. J.A. Makowsky, Classical graph properties and graph parameters and their definability in SOL. Structural Graph Theory DocCourse 2014: Lecture Notes: 22.

4.3 Journal Publications

1. J.A.Makowsky, Note on almost strongly minimal theories, Bull. Acad. Pol. Sc. vol 20, No.7, 1972, pp. 529 - 534 (MR 47 # 35)

2. J.A.Makowsky, Langages engendres a partir des formules de Scott, C. R. hebd. Acad. Sc. Paris t. 276 , 1973, pp.1585 - 1587 (MR 49 # 2357)

3. J.A.Makowsky, On some conjectures connected with complete sentences, Fund. Math., vol.81, 1974, pp. 193 - 202 (MR 51 # 2894)

4. J.A.Makowsky, S.Shelah and J.Stavi, Δ-Logics and generalized quantifiers, Annals of Mathematical Logic 10, 1976, pp155-192 (MR 56 # 15362)

5. J.A.Makowsky and A.Marcja, Completeness theorems for modal model theory with the Montague-Chang semantics,I., Zeitschrift fur mathematische Logik und Grundlagen der Mathematik, Bd. 23, 1977, pp 97-104 (MR 58# 5057, ZB 402.03020)

6. J.A.Makowsky and A.Marcja, Problemi di decidibilita in logica topologica, Rend. Sem. Mat. Univ. Padova, vol.56, 1977, pp 67-78 (MR 57# 16035)

7. J.A.Makowsky and S.Tulipani, Some model theory for monotone quantifiers, Archiv fur Mathematische Logik, 18, 1977, pp 115-134 (MR 57# 9474)

8. J.A.Makowsky, Some observations on uniform reduction for properties invariant on the range of definable relations, Fundamenta Mathematicae 99, 1978, pp 199-203 (MR 81e, # 03029)

9. J.A.Makowsky and S.Shelah, The theorems of Beth and Craig in abstract model theory, I.The abstract setting, Transactions of the AMS 256, 1979, pp 215-239 (MR 81b #03041, ZB 428.03032)

10. J.A.Makowsky and S.Shelah, The theorems of Beth and Craig in abstract model theory, II. Compact logics, Archiv für Mathematische Logik, 21, 1981, pp. 13-35 (MR 83g #03034, ZB 472.03028)

11. J.A.Makowsky and M.Ziegler, Topological model theory with an interior operator, Archiv fur Mathematische Logik, 21, 1981, pp. 37-54 (MR # 83h:03051, ZB 472.03027)

12. J.A.Makowsky and S.Shelah, Positive results in abstract model theory: A theory of compact logics, Annals of Pure and Applied Logic, vol. 25.3 (1983) pp.263-300 (MR # 85i:03125, ZB 522:68026).

13. B.Mahr and J.A.Makowsky, Characterizing specification languages which admit initial semantics, (full version) Theoretical Computer Science, 31 (1984) pp.49-60, (MR # 85h:68044, ZB 536:68011).
Extended abstract as Conference paper 86.

14. M.Tiomkin and J.A.Makowsky, Propositional dynamic logic with local assignments, Theoretical Computer Science, vol. 36.1 (March 1985) pp.71-87.

15. J.A.Makowsky, Vopenka's principle and compact logics, Journal of Symbolic Logic, vol. 50.1 (March 1985) pp.42-48.

16. O.Grumberg, N.Francez, J.A.Makowsky and W.de Roever, A proof rule for fair termination of guarded commands, Information and Control, vol. 66.1-2 (1986) pp.83-102.
First version published as Conference paper 82.

17. J.A.Makowsky and M.Vardi, On the expressive power of data dependencies, Acta Informatica, vol 23.3 (1986) pp.231-244.

18. J.A. Makowsky, Why Horn formulas matter in computer science: Initial structures and generic examples, Journal of Computer and System Sciences, vol. 34.3/4 (1987), pp. 266-292.
First version published as Conference paper 88

19. A. Itai and J.A. Makowsky, Unification as a complexity measure for logic programming, Journal of Logic Programming, vol. 4.2. (1987), pp. 105-117.

20. E. Dahlhaus, A. Israeli and J.A. Makowsky, On the existence of polynomial time algorithms for interpolation problems in propositional logic, Notre Dame Journal of Formal Logic, vol. 29.4 (1988), pp. 497-509.

21. J.A.Makowsky and I.Sain, Weak second order characterizations of various program verification systems, Theoretical Computer Science, vol. 66 (1989), pp. 299-321.
First version published as 89

22. V.E. Markowitz and J.A. Makowsky, Identifying extended entity–relationship object structures in relational schemas, IEEE Transactions on Software Engineering, vol. 16.8 (1990), pp. 777-790.

23. M.Tiomkin and J.A.Makowsky, Decidability of finite probabilistic propositional dynamic logic, Information and Computation, vol. 94.2 (1991), pp. 180-203.

24. E. Dahlhaus and J.A. Makowsky, Query languages for hierarchic databases, Information and Computation vol 101.1, (1992), pp.1-32
Partial versions published as conference papers 90, 91 and 92.

25. J.A.Makowsky, J.C. Grégoire and M. Sagiv, On the expressive power of side effects in propositional PROLOG, Journal of Logic Programming, vol. 12 (1992), pp. 179-188.

26. J.A.Makowsky and J. Ukelson, A formalism for interactive menu design, Interacting with Computers, vol. 4(1), (1992), pp. 83-110.

27. J.A. Makowsky and A. Sharell, On the average case complexity of SAT for symmetric distributions, Logic and Computation, vol. 5.1 (1995), pp. 71-92.

28. J.A. Makowsky and Y.B. Pnueli, Arity vs. Alternation in Second Order Logic, Annals of Pure and Applied Logic, vol. 78 (1-3), 1996, pp. 189-202. Erratum in Annals of Pure and Applied Logic, vol. 92 (1998) p. 215.
Conference version published as 104

29. J. Adamek, P.T. Johnstone, J.A. Makowsky and J. Rosicky, Finitary Sketches, Journal of Symbolic Logic, vol. 62.3 (1997) pp.699-707.

30. G.Venkatesan, U.Rotics, M.S.Madanlal, J.Makowsky and C.Pandu Rangan, Restrictions of Minimum Spanner Problems, *Information and Computation*, 136 (1997) pp. 143-164.

31. M. Kaminski, J. Makowsky and M. Tiomkin, Extensions for Open Default Theories via the Domain Closure Assumption, *Logic and Computation*, vol. 8.2 (1998), pp. 169-187.
Conference version published as 108 M. Kaminski, J. Makowsky and M. Tiomkin, Extensions for Open Default Theories via the Domain Closure Assumption, in *Proceedings of the 5th European Workshop on Logics in Artificial Intelligence - JELIA'96*, J.J. Alfers, L.M. Pereira, and E. Orlowska eds., Springer, Berlin 1996, pp. 373-387 (*Lecture Notes in Artificial Intelligence* 1126).

32. J.A. Makowsky and E.V. Ravve, Dependency Preserving Refinements and the Fundamental Problem of Database Design, *Data & Knowledge Engineering*, vol. 24.3 (1998) pp. 277-312.
Earlier version published as conference papers 109 and 111. J.A. Makowsky and E.V. Ravve, Translation Schemes and the Fundamental Problem of Database Design (Invited lecture for ER'96), In *Conceptual Modeling–ER'96*, B. Thalheim ed., LNCS vol. 1157 (1996) pp. 5-26.

33. J.A. Makowsky and U. Rotics, On the Clique-width of Graphs with Few P_4's, International Journal of Foundations of Computer Science, 10 (1999) pp. 329-348.

34. B. Courcelle, J.A. Makowsky and U. Rotics, Linear Time Solvable Optimization Problems on Certain Structured Graph Families, Theory of Computing Systems, vol. 33.2 (2000) pp. 125-150.
Conference version published as 112.

35. B. Courcelle, J.A. Makowsky and U. Rotics, On the Fixed Parameter Complexity of Graph Enumeration Problems Definable in Monadic Second Order Logic, Discrete Applied mathematics, vol. 108, No. 1-2 (2001), pp. 23-52.

36. B. Courcelle and J.A. Makowsky, Fusion in Relational Structures and the Verification of Monadic Second Order Properties, Mathematical Structures in Computer Science, vol. 12.2 (2002) pp. 203-235

37. J.A. Makowsky and J.P. Mariño, Farrell Polynomials on Graphs of Bounded Tree Width, Advances in Applied Mathematics, vol. 30, (2003), pp. 160-176

38. J.A. Makowsky and J.P. Mariño, On the Parametrized Complexity of Knot Polynomials, Journal of Computer and System Sciences, vol. 67.4, (2003) pp. 742-756

39. J.A. Makowsky and J.P. Mariño, Treewidth and the Monadic Quantifier Hierarchy, Theoretical Computer Science, 303 (2003) 157-170.

40. M. Lotz and J.A. Makowsky, On the Algebraic Complexity of Some Families of Coloured Tutte Polynomials, Advances in Applied Mathematics, 32.1-2 (2004) 327-349.

41. J.A. Makowsky, Algorithmic Uses of the Feferman-Vaught Theorem, Annals of Pure and Applied Logic, 126 (2004) pp. 159-213

42. E. Fischer and J.A. Makowsky, On Spectra of Sentences in Monadic Second Order Logic with Counting, Journal of Symbolic Logic, 69.3 (2004) pp. 617-640

43. J.A. Makowsky, Colored Tutte Polynomials and Kauffman Brackets for Graphs of Bounded Tree Width, Discrete Applied Mathematics, 145.2 (2005) pp. 276-290

44. D. Aharonov, Z. Landau and J.A. Makowsky, The quantum FFT can be classically simulated, arXiv: quant-ph/0611156vl (14. November 2006).

45. E. Fischer, J.A. Makowsky and E. Ravve, Counting Truth Assignments of Formulas of Bounded Tree Width, Discrete Applied Mathematics, 156 (2008), pp. 511-529. Available online since October 2007.

46. A. Cohen, M. Kaminski and J.A. Makowsky, Notions of sameness by default and their application to anaphora, vagueness and uncertain reasoning, Journal of Logic, Language and Information, 17.3 (2008), pp. 285-306.

47. J.A. Makowsky, From a Zoo to a Zoology: Towards a General Theory of Graph Polynomials, Theory of Computing Systems, 43 (2008), pp. 542-562. (available online since October 2007.)

48. J.A. Makowsky, From Hilbert's Program to a Logic Toolbox. Annals of Mathematics and Artificial Intelligence, 53.1-4 (2008), pp. 225-250.
Special issue to honor the 65th birthday of Victor Marek, edited by Michael Kaminski and Miroslaw Truszczynski.

49. M. Bläser, H. Dell and J.A. Makowsky, Complexity of the Bollobas-Riordan Polynomial: Exceptional points and uniform reductions. Theory of Computing Systems, 46.4 (2010) pages 690-706.
doi:10.1007/s00224-009-9213-7

50. I. Averbouch, B. Godlin and J.A. Makowsky, An extension of the bivariate chromatic polynomial. European Journal of Combinatorics, Volume 31, Issue 1, January 2010, Pages 1-17.

51. P. Tittmann, I. Averbouch and J.A. Makowsky, The Enumeration of Vertex Induced Subgraphs with respect to the Number of Components, European Journal of Combinatorics 32.7 (2011), Pages 954974.

52. I. Averbouch, T. Kotek, J. A. Makowsky, E. V. Ravve. The Universal Edge Elimination Polynomial and the Dichromatic Polynomial. Electronic Notes in Discrete Mathematics 38, (2011) pp 77-82

53. E. Fischer, T. Kotek and J.A. Makowsky, Application of Logic to Combinatorial Sequences and Their Recurrence Relations, in: Contemporary Mathematics, vol 558, American Mathematical Society (2011). pp. 1.42.

54. T. Kotek, J.A. Makowsky and B. Zilber, On Counting Generalized Colorings, in: Contemporary Mathematics, vol 558, American Mathematical Society (2011). pp. 207-242.

55. E. Engeler, N. Hungerbhler and J. A. Makowsky. Remembering Ernst Specker (19202011). Elemente der Mathematik 67.3 (2012): 89-115.

56. B. Godlin, E. Katz and J.A. Makowsky, Graph polynomials: From Recursive Definitions to Subset Expansion Formulas. Journal of Logic and Computation, Volume 22(2), (2012) Pages 237-265

57. T. Kotek and J.A. Makowsky, A Representation Theorem for Holonomic Sequences Based On Lattice Paths. Fundamenta Informaticae, 117.1-4 (2012), pp. 199-213.

58. A. Durand, N. Jones, J.A. Makowsky, M. Moore, Fifty Years of the Spectrum Problem: Survey and New Results, Bulletin of Symbolic Logic, 18.4 (2012) pp. 505-553.

59. T. Kotek and J.A. Makowsky, A Representation Theorem for (q)-Holonomic Sequences. Journal of Computer and System Sciences, 80.2 (2013) , pp. 363-374

60. J. A. Makowsky, Elena V. Ravve, On the Location of Roots of Graph Polynomials. Electronic Notes in Discrete Mathematics 43, (2013), pp. 201-206

61. J.A. Makowsky, E.V. Ravve and N.K. Blanchard, On the location of of roots of graph polynomials, accpted for publication in the European Journal of Combinatorics, 2014 Eur. J. Comb. 41, (2014), pp. 1-19

62. T. Kotek and J.A. Makowsky, Recurrence Relations for Graph Polynomials on Bi-iterative Families of Graphs, Eur. J. Comb. 41, (2014), pp. 47-67

63. T. Kotek and J.A. Makowsky, Connection matrices and the definability of graph parameters, Logical Methods in Computer Science 10(4) (2014), pp. 1-33
Special issue of selected papers from CSL-2012.

64. J.A. Makowsky and A. Zamansky. Keeping logic in the trivium of computer science: a teaching perspective. Formal Methods in System Design 51.2 (2017): 419-430.

65. T. Kotek, J. A. Makowsky and Elena V. Ravve. On sequences of polynomials arising from graph invariants. European Journal of Combinatorics 67 (2018): 181-198.

66. A. Goodall, M. Hermann, T. Kotek, J. A. Makowsky and Seven D. Noble. On the complexity of generalized chromatic polynomials. Advances in Applied Mathematics 94 (2018): 71-102.

67. J.A. Makowsky and R. X. Zhang. On P-unique hypergraphs. Australasian Journal of Combinatorics 73.3 (2019): 456-465.

68. J.A. Makowsky, Can one design a geometry engine? On the (un) decidability of certain affine Euclidean geometries. Annals of Mathematics and Artificial Intelligence 85 (2019): 259-291.

69. J.A. Makowsky, E. V. Ravve and T. Kotek. A logician's view of graph polynomials. Annals of pure and applied logic 170.9 (2019): 1030-1069.

70. J.A. Makowsky and V. Rakita. Weakly distinguishing graph polynomials on addable properties. Moscow Journal of Combinatorics and Number Theory 9.3 (2020): 333-349.

71. O. Herscovici, J. A. Makowsky and Vsevolod Rakita. Harary Polynomials. Enumerative Combinatorics and Applications ECA 1:2 (2021) Article #S2R13

72. T. Kotek and J. A. Makowsky. On the Tutte and matching polynomials for complete graphs. Fundamenta Informaticae 186.1-4 (2022): 155-173.

73. E. Fischer and J. A. Makowsky. Extensions and Limits of the Specker-Blatter Theorem. arXiv preprint arXiv:2206.12135 (2022). Submitted to JSL.

74. E. Fischer, J. A. Makowsky and V. Rakita. MC-finiteness of restricted partition functions. to be submitted, 2023.

75. J.A. Makowsky and V. Rakita. Almost unimodal and real-rooted graph polynomials. European Journal of Combinatorics 108 (2023): 103637.

4.4 Refereed Conferences

The papers 98,102, 106 and 113 appear in volumes of the Lecture Notes in Computer Science dedicated to papers selected and refereed after the conference. Similarly, the papers 76, 78, 79, 85 and 97 appear in conference proceedings of ASL conferences, which contain only specially selected papers. Paper no. 14 was accepted for publication in the special issue of the JCSS dedicated to selected papers of STOCS'81, but was withdrawn when the results were superceded.

76. J.A.Makowsky, Securable quantifiers, κ-unions and admissible sets, Logic Colloquium '73, Rose et al.ed., Amsterdam 1975 pp 409-428 (MR 52 # 5345)

77. J.A.Makowsky, Topological model theory: A survey, Model theory and applications, P. Mangani ed. Rome 1975, pp 121-150 (MR 80j # 03052)

78. J.A.Makowsky, The reals cannot be characterized topologically with strictly local properties and countability axioms, Fourth Scandinavian Logic Symposium, Jyvaskyla 1976, Essays on Mathematical and Philosophical Logic, Dordrecht 1978 (Reidel), pp. 251-257 (MR 80h # 03055, ZB 402.03037)

79. J.A.Makowsky, Quantifying over countable sets: Stationary logic vs. positive logic, Logic Colloquium '77 , L.Pacholski et al.ed., Amsterdam 1978, pp183-194 (ZB 469.03021)

80. J.A.Makowsky, Measuring the expressive power of dynamic logics: An application of abstract model theory, ICALP 1980, Lecture Notes in Computer Science vol.85, pp.409-421 (MR 82c # 03022, ZB 465.68012).
Erratum to "Measuring the expressive power of dynamic logic." ICALP 1981, Lecture Notes in Computer Science vol.115. (MR 82j # 03021, ZB 465.68013).

81. A.Chandra , H.Lewis and J.A.Makowsky, Embedded implicational dependencies and their inference problem (the untyped case), Proceedings XP1 Workshop on Relational Database Theory, Stony Brook, NY 1980 (SIGMOD 1981)

82. O.Grumberg, N.Francez, J.A.Makowsky and W.de Roever, A proof rule for fair termination of guarded commands, Algorithmic languages, de Bakker ed., Amsterdam 1981,pp 399-416, (MR # 83h:68024).
Journal version published as 16

83. A.Chandra , H.Lewis and J.A.Makowsky, Embedded implicational dependencies and their inference problem (the typed case), ACM Symposium on the Theory of Computing 1981, pp.342-354.

84. J.A.Makowsky, Characterizing database dependencies, ICALP 1981 Lecture Notes in Computer Science, vol.115, 1981, pp. 86-97 (ZB 515:68068).

85. J.A.Makowsky, Model theoretic issues in theoretical computer science, part I: Relational Data Bases and Abstract Data Types, in: Logic Colloquium '82, Proceedings of the Colloquium held in Florence 23-28 August 1982, G. Lolli et al. eds., North Holland 1984, pp. 303-343 (MR # 86c:68056, ZB 553:68028).

86. B.Mahr and J.A.Makowsky, Characterizing specification languages which admit initial semantics, Proceedings of the 8th CAAP 1983, LNCS 159 (1983) pp.300-316, (MR # 85e:68058, ZB 522: 68026).
Journal version published as 13.

87. B.Mahr and J.A.Makowsky, An axiomatic approach to specification languages, extended abstract, Theoretical Computer Science, 6th GI-Conference, Dortmund 1983, Lecture Notes in Computer Science, vol. 145, 1983, pp. 211-220, (MR # 84b:68003, ZB 493:68023).

88. J.A. Makowsky, Why Horn formulas matter in computer science: Initial structures and generic examples, Mathematical Foundations of Software Development, CAAP 1985, LNCS 185 (1985) pp.374-385
Journal version published as 18

89. J.A.Makowsky and I.Sain, On the equivalence of weak second order and nonstandard time semantics for Floyd-Hoare logic, Proceedings of the First IEEE Symposium on Logic in Computer Science, Cambridge, Mass. 1986, pp.293-300
Journal version published as 21

90. E.Dahlhaus and J.A. Makowsky, The choice of programming primitives for SETL-like programming languages, ESOP '86 (European Symposium on Programming, Saarbrucken, March 17-19 1986), B. Robinet and R. Wilhelm eds., LNCS 213 (1986) pp. 160-172.
Journal version published as 24

91. E. Dahlhaus and J.A. Makowsky, Computable directory queries, CAAP '86 (11th Colloquium on Trees and Algebra in Programming, Nice, March 24-26 1986), P. Franchi-Zannettacci ed., LNCS 214 (1986), pp. 254-265
Journal version published as 24

92. E. Dahlhaus and J.A. Makowsky, Computable directory queries, Proceedings of the workshop on "Logic and Computer Science, New trends and

applications", Torino, October 1986, in: Rend. Sem. Mat. Univ. Pol. Torino, Fascicolo speciale 1987, pp. 165-197.
Journal version published as 24

93. N. Rotitz (U. Rotics), J.A. Makowsky and V.E. Markowitz, Entity-Relationship Consistency for Relational Schemas, Proceedings of ICDT '86, Rome, September 1986, LNCS vol. 243 (1986), pp. 306-322

94. A. Ban and J.A. Makowsky, MUSICIAN - A Music Processing and Synthesis System, Proceedings of the 12th International Computer Music Conference, The Hague 1986, Addendum, pp. A22-A25

95. V.E. Markowitz and J.A. Makowsky, Incremental reorganization of relational databases, VLDB '87, Brighton England, September 1987, P. M. Stocker and W. Kent, eds., pp. 127-135.

96. V.E. Markowitz and J.A. Makowsky, Incremental restructuring of relational schemas, Proceedings of the 4th International Conference on Data Engineering, Los Angeles, February 1988, pp. 276-284.

97. J.A. Makowsky, The impact of model theory on computer science, Proceedings of the IX Congress of Logic, Methodology and Philosophy of Science, Uppsala 1991, D. Prawitz et al. eds., North Holland 1994, pp. 239-262.

98. Y. Bargury and J.A.Makowsky, The expressive power of transitive closure and 2–way multihead automata, Computer Science Logic, Refereed papers from CSL'91, LNCS vol. 626 (1992) pp. 1-14.

99. A. Calò and J.A. Makowsky, Ehrenfeucht–Fraïssé games for transitive closure, Logical Foundations of Computer Science–Tver '92, LNCS vol. 620, 1992, pp. 57-69.

100. R.A. Hasson and J.A. Makowsky, Update languages versus query languages, Proceedings of the XI International Conference of the Chilean Computer Science Society, Santiago de Chile, October 1991, pp. 17-30. Published also in book form by Plenum Publishing Corporation under the title: *Computer Science: Research and Applications*, R. Baeza-Yates and U. Manber eds., (1992), pp. 23-34.

101. J.C. Grégoire, J.A. Makowsky and S. Levin, Programming reactive systems with statecharts, The 5th Israeli Conference on Computer Systems and Software Engineering, Herzlia, May 1991, pp. 87-103.

102. J.A. Makowsky and Y.B. Pnueli, Oracles and Quantifiers. Computer Science Logic, Refereed papers from CSL'93, LNCS, vol. 832, 1994, pp. 189-222.

103. J.A. Makowsky, Capturing Complexity Classes with Lindström Quantifiers, Invited Lecture, Proceedings of the 19th International Symposium, MFCS'94 Kosice, Slovakia, LNCS vol. 841, 1994, pp. 68-71.

104. J.A. Makowsky and Y.B. Pnueli, Arity vs. Alternation in Second Order Logic, Logical Foundations of Computer Science–St. Petersburg 1994, LNCS, vol. 813, 1994, pp. 240-252.
Journal version published as 28.

105. J.A. Makowsky, Capturing Relativized Complexity Classes with Lindström Quantifiers, Invited Lecture, *The Foundational Debate*, W. DePauli-Schimanovich ed., Kluwer Academic Publishers, 1995, pp. 133-140.

106. J.A. Makowsky and Y.B. Pnueli: Logics Capturing Relativized Complexity Classes Uniformly, Proceedings of LCC'94, Logic and Computational Complexity, D. Leivant ed., Lecture Notes in Computer Science vol. 960, 1995, pp. 463-479.

107. J.A. Makowsky and E. Ravve, Incremental model checking for decomposable structures, Mathematical Foundations of Computer Science 1995, J. Wiedermann and P. Hajek eds., Lecture Notes in Computer Science, vol. 969 (1995), pp. 540-551.

108. M. Kaminski, J. Makowsky and M. Tiomkin, Extensions for open default theories via the domain closure assumption, in *Proceedings of the 5th European Workshop on Logics in Artificial Intelligence - JELIA'96*, J.J. Alfers, L.M. Pereira, and E. Orlowska eds., Springer, Berlin 1996, pp. 373-387 (*Lecture Notes in Artificial Intelligence* 1126).
Journal version published as 31.

109. J.A. Makowsky and E.V. Ravve, Translation Schemes and the Fundamental problem of Database Design (Invited lecture for ER'96), In *Conceptual Modeling–ER'96*, B. Thalheim ed., LNCS vol. 1157 (1996) pp. 5-26.
Journal version published as 32

110. J.A. Makowsky, Invariant Definability, in *Computational Logic and Proof Theory*, Proceedings of the 5th Kurt Gödel Colloquium, KGC'97, Vienna, August 1997, LNCS vol. 1289 (1997), pp. 186-202.

111. J.A. Makowsky and E.V. Ravve, The Fundamental problem of Database Design (Invited lecture for SOFSEM'97), SOFSEM'97: Theory and Practice in Informatics, LNCS Volume 1338 (1997), pp. 53-69.
Journal version published as 32

112. B. Courcelle, J.A. Makowsky and U. Rotics, Linear time solvable optimization problems on certain structured graph families, Proceedings of WG'98, Smolenice, Slovakia, June 1998, LNCS vol. 1517 (1998) pp. 1-16.

113. J.A. Makowsky, Invariant Definability and P/poly, *Computer Science Logic*, Proceedings of CSL'98, Brno, Czech Republic, August 1998, (G. Gottlob, E. Grandjean and K. Seyr, eds), LNCS, vol. 1584 (1999) pp. 142-158.

114. J.A. Makowsky and K. Meer, Polynomials of Bounded Tree Width, Extended Abstract, In: Formal Power Series and Algebraic Combinatorics, Porceedings of the 12th International Conference, FPSAC'00, Moscow, Russia, June 2000, D. Krob, A.A. Mikhalev and A.V. Mikhalev eds., Springer, 2000, pp. 692-703.

115. B. Courcelle and J.A. Makowsky, VR and HR Graph Grammars: A Common Algebraic Framework Compatible with Monadic Second Order Logic, Extended Abstract, accepted to GRATRA'2000, Berlin, October 2000.
Journal version published as 36

116. J.A. Makowsky and K. Meer, On the Complexity of Combinatorial and Metafinite Generating Functions of Graph Properties in the Computational Model of Blum, Shub and Smale, Proceedings of the 14th International Workshop, CSL'2000, Annual Conference of the EACSL, Computer Science Logic, LNCS vol. 1862 (P. Clote and H. Schwichtenberg eds.), pp. 399-410

117. J.A. Makowsky, Colored Tutte Polynomials and Kauffman Brackets for Graphs of Bounded Tree Width, Proceedings of the 12th Annual ACM-SIAM Symposium on Discrete Algorithms SODA'01, Washington DC, 2001, pp. 487-495
Journal version published as 43

118. J.A. Makowsky and J. Mariño, Graph Polynomials on Graphs of Bounded Tree Width, accepted to FPSAC'01, Phoenix, USA, May 2001.
Journal version published as 37

119. J.A. Makowsky and J. Mariño, Treewidth and the Monadic Quantifier Hierarchy, accepted to LCCS'01, Paris, France, August 2001.
Journal version published as 39

120. A. Glikson and J.A. Makowsky, NCE graph Grammars and Clique Width, in: Graph-Theoretic Concepts in Computer Science, Proceedings of WG'03, LNCS 2880 (2003) 237-248.

121. E. Fischer and J.A. Makowsky, The Specker-Blatter Theorem Revisited: Generating Functions for Definable Classes of Structures, in:Computing and Combinatorics, Proceedings of COCOON'03, LNCS 2697 (2003) 90-1001.

122. J.A. Makowsky, U. Rotics, I. Averbouch and B. Godlin, Computing graph polynomials on graphs of bounded clique-width, in: Graph-Theoretic Concepts in Computer Science, 32nd International Workshop, WG 2006, Bergen,

Norway, June 22-23, 2006, Revised Papers, Lecture Notes in Computer Science vol. 4271 (2006) pp. 191-204.

123. J.A. Makowsky, From a Zoo to a Zoology: Descriptive Complexity for Graph Polynomials, in: Logical Approaches to Computational Barriers, Second Conference on Computability in Europe, CiE 2006, Swansea, UK, July 2006, Lecture Notes in Computer Science vol. 3988 (2006) pp. 330-341

124. M. Bläser, H. Dell and J.A. Makowsky, Complexity of the Bollobas-Riordan Polynomial: Exceptional points and uniform reductions, 3rd International Computer Science Symposium in Russia (CSR 2008) June 7-12, 2008, Moscow, Russia, Lecture Notes in Computer Science vol. 5010 (2008) pp. 86-98.

125. I. Averbouch, B. Godlin and J.A. Makowsky, A Most General Edge Elimination Polynomial, WG 2008, 34th International Workshop on Graph-Theoretic Concepts in Computer Science. 30 June - 2 July 2008, Durham University, U.K. Lecture Notes in Computer Science vol. 5344 (2008) pp. 31-42.

126. B. Godlin, T. Kotek and J.A. Makowsky, Evaluations of Graph Polynomials, WG 2008, 34th International Workshop on Graph-Theoretic Concepts in Computer Science. 30 June - 2 July 2008, Durham University, U.K. Lecture Notes in Computer Science vol. 5344 (2008) pp. 183-194.

127. T. Kotek, J.A. Makowsky and B. Zilber On Counting Generalized Colorings, CSL 2008, 17th EACSL Annual Conference on Computer Science Logic, 15th-20th September 2008, Bertinoro, Italy Lecture Notes in Computer Science vol. 5213 (2008) pp. 339-353.

128. J. A. Makowsky, Uniform Algebraic Reducibilities between Parameterized Numeric Graph Invariants. Logic and Theory of Algorithms, Proceedings of CiE 2008, LNCS 5028 (2008), pp. 403-406.

129. J.A. Makowsky, Connection Matrices for MSOL-definable Structural Invariants, Proceedings of the Third Indian Conference on Logic and its Applications, January 7-11, 2009, Chennai, India ICLA 2009, LNCS (LNAI) 5378 (2009), pp. 51-64.

130. I. Averbouch, J.A. Makowsky and P. Tittmann, A Graph Polynomial Arising from Community Structure, Graph-Theoretic Concepts in Computer Science (WG'09), LNCS Volume 5911 (2010), pp. 33-43

131. I. Averbouch, T. Kotek, J.A. Makowsky and E.V. Ravve, The Universal Edge Elimination Polynomial and the Dichromatic Polynomial, Proceedings of EUROCOMB 2011, to appear in the Electronic Notes in Discrete Mathematics

132. J.A. Makowsky, Application of Logic to Integer Sequences: A Survey. In: *Logic, Language, Information and Computation, 17th International Workshop, WoLLIC 2010, Brasilia, Brazil, July 6-9, 2010. Proceedings*, Anuj Dawar and Ruy J. G. B. de Queiroz eds., Lecture Notes in Computer Science, volume 6188, pages 34-41, Springer, 2010

133. J. A. Makowsky: Model Theory in Computer Science: My Own Recurrent Themes. CSL 2011, Marc Bezem, ed., Computer Science Logic, 25th International Workshop / 20th Annual Conference of the EACSL, CSL 2011, September 12-15, 2011, Bergen, Norway, Proceedings, Schloss Dagstuhl - Leibniz-Zentrum fuer Informatik, LIPIcs, vol. 12 (2011) pp. 553-567.

134. T. Kotek and A. Makowsky. Connection Matrices and the Definability of Graph Parameters. CSL 2012, P. Cégielski and A. Durand eds., Computer Science Logic (CSL'12) - 26th International Workshop/21st Annual Conference of the EACSL, CSL 2012, September 3-6, 2012, Fontainebleau, France, Schloss Dagstuhl - Leibniz-Zentrum fuer Informatik, LIPIcs, vol. 16 (2012) pp. 411-425.

135. J. A. Makowsky. Definability and Complexity of Graph Parameters (Invited Talk). CSL 2012, P. Cégielski and A. Durand eds., Computer Science Logic (CSL'12) - 26th International Workshop/21st Annual Conference of the EACSL, CSL 2012, September 3-6, 2012, Fontainebleau, France, Schloss Dagstuhl - Leibniz-Zentrum fuer Informatik, LIPIcs, vol. 16 (2012) pp. 414-415.

136. T. Kotek, J. A. Makowsky, E. V. Ravve, A Computational Framework for the Study of Partition Functions and Graph Polynomials. IEEE Proceedings of SYNASC'2012, (2013), pp. 365-368

137. N. Labai and J.A. Makowsky, Weighted Automata and Monadic Second Order Logic. Proceedings of GandALF 2013, EPTCS 119 (2013), pp. 122-135

138. J.A. Makowsky and E.V. Ravve, On the Location of Roots of Graph Polynomials. Electronic Notes in Discrete Mathematics 43 (2013) pp. 201-206

139. N. Labai and J.A. Makowsky, Tropical Graph Parameters, Paper presented at FPSAC 2014, DMTCS Proceedings (2014), pp. 357-368

140. N. Labai and J.A. Makowsky, Hankel Matrices: From Words to Graphs. Proceedings of LATA 2015, LNCS 8977 (March 2015), pp. 47-55.

141. T. Kotek, J. A. Makowsky, Efficient computation of generalized Ising polynomials on graphs with fixed clique-width, Proceedings of *Topics in Theoretical Computer Science (TTCS), Teheran, Augsut 2015*, M.T. Hajiaghayi and M.R. Mousavi (Eds.), LNCS 9541 (2016) pp. 135-146.

142. N. Labai and J.A. Makowsky, Hankel matrices for weighted visibly pushdown automata, accepted for LATA 2016, to appear in LNCS.

143. N. Labai and J. A. Makowsky. On the Exact Learnability of Graph Parameters: The Case of Partition Functions. 41st International Symposium on Mathematical Foundations of Computer Science (MFCS 2016). Vol. 58. Schloss Dagstuhl–Leibniz-Zentrum fuer Informatik, 2016.

144. J.A. Makowsky and E. V. Ravve. Semantic Equivalence of Graph Polynomials Definable in Second Order Logic. Proceedings of the 23rd International Workshop on Logic, Language, Information, and Computation, LNCS Volume 9803. 2016.

145. J. A. Ellis-Monaghan, A. J. Goodall, J. A. Makowsky and I. Moffatt, Graph Polynomials: Towards a Comparative Theory (Dagstuhl Seminar 16241). Dagstuhl Reports, volume 6.6, (2016) pp. 26–48.

146. J.A. Makowsky The Undecidability of Orthogonal and Origami Geometries. Logic, Language, Information, and Computation: 25th International Workshop, WoLLIC 2018, Bogota, Colombia, July 24-27, 2018, Proceedings 25. Springer Berlin Heidelberg, 2018. pp. 250-270

147. J.A. Makowsky The undecidability of various affine Pappian geometries: wrong proofs and new true theorems. Logical Perspectives 2018 (2018): 21.

148. V. Rakita and J. A. Makowsky. On Weakly Distinguishing Graph Polynomials. Discrete Mathematics & Theoretical Computer Science 21 (2019). Proceedings of EUROCOM 2019.

Articles in collections

149. J.A.Makowsky, Mental Images and the Architecture of Concepts, The Universal Turing Machine: A Half-Century Survey, R.Herken ed., Oxford University Press, London 1988, pp. 453-466. Second edition: Springer 1995.

150. E.Dahlhaus and J.A.Makowsky, Gandy Machines as a Model of Parallel Computation, in: The Universal Turing Machine: A Half-Century Survey, R.Herken ed., Oxford University Press, London 1988, pp. 309-314. Second edition: Springer 1995.

151. J.A. Makowsky and K. Meer, Polynomials of Bounded Tree Width, Refereed paper in: Foundations of Computational Mathematics, Proceedings of the Smalefest 2000, F. Cucker and M. Rojas (eds.), World Scientific, 211-250, 2002.

152. A. Cohen, M. Kaminski and J.A. Makowsky, Indistinguishibality be default, in: Sergei N. Artmov, Howard Barringer, Artur S. d'Avila Garcez, Lus C. Lamb, John Woods (Eds.): We Will Show Them! Essays in Honour of Dov Gabbay, Volume One. College Publications 2005, pp. 415-428

153. J.A. Makowsky, Encounters with A. Mostowski, in: 70 Years of Foundational Studies, In memoriam of Andrzej Mostowski. W. Marek and M. Srebrny editors. IOS Press 2008. in press

154. E. Fischer and J.A. Makowsky Linear Recurrence Relations for Graph Polynomials, Special volume of LNCS in honour of Boris (Boaz) A. Trakhtenbrot on the occasion of his 85th birthday. LNCS 4800 (2008) pp. 266-279.

155. T. Kotek and J.A. Makowsky, Definability of Combinatorial Functions and Their Linear Recurrence Relations, In: *Fields of Logic and Computation, Essays Dedicated to Yuri Gurevich on the Occasion of His 70th Birthday*, Andreas Blass and Nachum Dershowitz and Wolfgang Reisig eds., Lecture Notes in Computer Science, vol. 6300, pages 444-462, Springer 2010.

156. J.A. Makowsky, From Parikh's Theorem to Many-Sorted Spectra, In: *Games, Norms and Reason. Logic at the Crossroads* J. van Benthem, A. Gupta and E. Pacuit eds. Synthese Library vol. 353 (2011), Springer, pp. 163–177.

157. J.A. Makowsky and E.V. Ravve, BCNF via attribute splitting, In: *Conceptual Modelling and Its Theoretical Foundations*, Essays Dedicated to Bernhard Thalheim on the Occasion of His 60th Birthday, A. Duesterhoeft, M. Klettke, K.-D. Schewe, eds. LNCS 7260 (2012), pages 73-84.

158. T. Kotek, J.A. Makowsky and E.V. Ravve, A computational framework for the study of partition functions and graph polynomials, In: Proceedings of the 12th Asian Logic Conference, R. Downey, J. Brendle, R. Goldblatt and B. Kim eds., World Scientific (2013), pp. 210-230.

159. E. Fischer, T. Kotek and J.A. Makowsky, Application of Logic to Combinatorial Sequences and Their Recurrence Relations, in: Contemporary Mathematics, vol 558, American Mathematical Society (2011). pp. 1.42.

160. T. Kotek, J.A. Makowsky and B. Zilber, On Counting Generalized Colorings, in: Contemporary Mathematics, vol 558, American Mathematical Society (2011). pp. 207-242.

161. J.A. Makowsky and N. Labai, Logics of Finite Hankel Rank. In: Fields of Logic and Computation II (pp. 237-252). Springer International Publishing.

162. J.A. Makowsky, To Yuri at 80 and More than 40 Years of Friendship. In: Fields of Logic and Computation III, (2020) Lecture Notes in Computer Science book series (LNPSE,volume 12180)

163. J.A. Makowsky, Scholar articles Some Thoughts on Computational Models: From Massive Human Computing to Abstract State Machines, and Beyond. In: Logic, Computation and Rigorous Methods: Essays in honour of E. Börger, pp 173186 Lecture Notes in Computer Science book series (LNPSE,volume 12750) (2021)

164. T. Kotek and J. A. Makowsky. The exact complexity of the Tutte polynomial. In: Handbook of the Tutte Polynomial and Related Topics. (edt: J. Ellis-Monaghan and I. Moffatt), Chapman and Hall/CRC, (2022). pp. 175-193.

165. L. Beklemishev, A. Dmitrieva, and J. A. Makowsky. Axiomatizing Origami planes. arXiv preprint arXiv:2012.03250 (2020). to appear in: Essays dedicated to Dick de Jongh for his 80th birthday.

4.5 Other Publications

This list contains a selection of various professionally relevant publications. It does neither contain the items of the computing column of Finanz & Wirtschaft nor my literary essays.

Reviews

1. J.A.Makowsky, Review of *J.Ullman, Principles of Data Base Systems; D.Maier, The Theory of Relational Databases; A.Chandra and D.Harel, computable queries for Relational Data Bases.* Journal of Symbolic Logic, vol. 51.4 (1987) pp. 1079-1084.

2. J.A. Makowsky, Review of *J. Paradeans et. al., The Structure of the Relational Database Model*, Journal of Symbolic Logic, Vol. 57.2 (1992) pp. 759-760.

3. J.A. Makowsky, Review of *E.G. Manes, Predicate Transformer Semantics,* SIGACT News, Winter 1993.

4. J.A. Makowsky, Review of *H. Mannila and K.-J. Räihä, The design of relational databases, S. Abiteboul, R. Hull and V. Vianu, Foundations of databases, P. Kanellakis, Elements of relational database theory*, Journal of Symbolic Logic, vol. 62.1 (1997) pp. 324-326.

5. J.A. Makowsky, Zen oder die Kunst eine Turing Maschine zu warten, Review of *Oswald Wiener, Manuel Bonik und Robert Hoedicke, Eine Elementare Einfuerung in die Theorie der Turing–Maschinen*, Puplished in **Der Standard**, Vienna, 31. Juli 1998

Computing Related

6. J.A.Makowsky, Logic Programming und die fünfte Computergeneration, Neue Zürcher Zeitung, Forschung und Technik Nr.250, 26.Oct.1983.

7. J.A.Makowsky, 1984: Brave new work, in "Kursbuch 75: Computer Kultur", J.A.Makowsky, K.M.Michel et al. ed., Kursbuch Verlag Berlin 1984 (March), pp.119-143.

8. J.A.Makowsky, Blind rush for the new gold, The Jerusalem Post, Friday, April 19, 1985, page 9. (This is an article about software problems related to the Star War project of the Reagan administration)

9. J.A.Makowsky, Die elektronische Brieftasche, Computer World Schweiz, No.3 (2.December 1985) pp. 10-11. (This is an article about a patent in cryptography submitted by S. Even, O. Goldreich and Y. Yacobi)

10. J.A.Makowsky, Computeranimation - High-Tech-Trickfilm oder Aufbruch in neue Visualisierungsmöglichkeiten, in: Simulation und Wirklichkeit, A.Schönberger ed., DuMont, Köln, 1988, pp. 149-155.

Other Topics

11. J.A.Makowsky, Münchhausen's theorem und seine Bedeutung für die Musik und Musikwissenschaft, in "Die Zeichen, Neue Aspekte der musikalischen Aesthetik II", H.W.Henze ed. Frankfurt a.M. 1981, pp 278-307

12. J.A.Makowsky, Angst vor der Elite, in "Kursbuch 80: Begabung und Erziehung", K.M.Michel and T.Spengler ed., Kursbuch Verlag Berlin 1985 (May), pp.151-156. (Reprinted in Bulletin, Mitteilungen des Schweizerischen Bühnenverbandes, 8 (1985).)

13. J.A.Makowsky, Postzionismus und religiöse Rückkehr im Israel von heute, Jüdische Rundschau (Maccabi), Nr.38 (19.Sept. 1985), pp.23-25.

14. R.M. Lüscher, Henry und die Krümelmonster: Versuch über den fordistischen Sozialcharakter, edited by J.A.Makowsky, konKursbuch Verlag Claudia Gehrke, Tübingen,1988.

15. J.A. Makowsky, Modernisms, Fiction and Mathematics. Notices of the AMS, Vol. 67, Num. 10, November 2020, pp. 1589-1595. (extended version: arXiv preprint arXiv:1907.05787 (2019)).