Alan Skelley

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USA   Citizenship: Canadian

Research Interests

Computational complexity, bounded arithmetic, propositional proof complexity, algorithms.

Education

- University of Toronto, Canada: **M.Sc.** (November 2000) and **Ph.D.** in computer science (completed November 2005, conferred June 2006). Supervised by Stephen A. Cook.

- University of Alberta, Canada: **B.Sc. Honours** in computing science with first class honors and departmental gold medal, June 1998.

- Languages: Fluent in English and French, conversational in modern Greek, some ability in Italian.

Academic Work Experience

- Dipartimento di Informatica, Università degli Studi di Roma "La Sapienza": Post-doctoral researcher, November 2006 – August 2007. Host: Nicola Galesi.

- Mathematical Institute, Academy of Sciences of the Czech Republic: Visiting Scholar, September 2005 – October 2006. Host: Jan Krajíček.

Publications

- Gary Valentin, Michael Zuliani, Danny Zilio, Guy Lohman and Alan Skelley, *DB2 Advisor: An Optimizer Smart Enough To Recommend Its Own Indexes*, Proc. of the 16th International Conference on Data Engineering, 2000.

- *Relating the PSPACE Reasoning Power of Boolean Programs and Quantified Boolean Formulas*, M.Sc. thesis, 2000. Also available from ECCC in the "theses" section.

- *Propositional PSPACE Reasoning with Boolean Programs Versus Quantified Boolean Formulas*, Proc. of the 31st International Colloquium on Automata, Languages, and Programming (ICALP 2004), Springer LNCS 3142, pp. 1163-1175.

- *A Third-Order Bounded Arithmetic Theory for PSPACE*, Proc. of Computer Science Logic 2004, 18th International Workshop of the EACSL, Springer LNCS 3210, pp. 340-354.

- *Theories and Proof Systems for PSPACE and the EXP-Time Hierarchy*, Ph.D. dissertation, 2005. Also available from ECCC in the "theses" section.

- *Third-Order Computation and Bounded Arithmetic*, Proc. of the Second Conference on Computability in Europe (CiE 2006), University of Wales Swansea, Computer Science Report Series. Full version to appear in a special issue of the Journal of Logic and Computation.

- Jan Krajíček, Alan Skelley and Neil Thapen, *NP Search Problems in Low Fragments of Bounded Arithmetic*, the Journal of Symbolic Logic, 72(2), pp. 649-672, 2007.

In Progress

- Alan Skelley and Neil Thapen, *A resolution lower bound for a principle capturing the hardness of depth-1 LK*, submitted.

- Alan Skelley and Neil Thapen, *The provably total search problems of bounded arithmetic*, submitted.

- *Propositional Proof Systems for the EXP-Time Hierarchy*, in preparation.

Teaching Experience

- **Instructor:** York University, Department of Computer Science and Engineering, January-April 2004. Taught COSC4111, a 4th-year computability and logic course.

- **Teaching Assistant:** University of Toronto, Department of Computer Science, September 1998-April 2005. TA for 18 terms, including courses on UNIX, compilers, data structures, discrete mathematics, theoretical computer science and logic.

- **Teaching Assistant:** University of Alberta, Department of Computing Science, September 1995-April 1998. TA for 6 terms, including courses on UNIX, operating systems, and logic.

- **Coach**, 2001-2002, 2002-2003 and **Assistant Coach**, 1998-1999, 1999-2000 and 2000-2001 University of Toronto ACM Programming Contest teams; world finalists each of 5 years.

Talks and Presentations

- Logic Seminar at the Mathematical Institute of the Academy of Sciences of the Czech Republic, Prague, 2006.

- Computability in Europe, Swansea, UK, 2006.

- Prague-Vienna Workshop on Proof Theory and Proof Complexity, 2006.

- Indiana University Logic Seminar, 2005.

- Eduard Čech Center, Telč, Czech Republic, 2005.

- Fall School of Logic of the Logic Seminar at the Mathematical Institute of the Academy of Sciences of the Czech Republic, September 2005.

- CSL 2004.

- ICALP 2004.

- Banff International Research Station, workshop on advances in complexity, July 2004.

- ICC 2003 (satellite workshop of LICS).

- Fall School of Logic of the Logic Seminar at the Mathematical Institute of the Academy of Sciences of the Czech Republic, September 2001.

- Institute for Advanced Study, workshop on proof complexity, December 2000.

- University of Toronto, theory seminar, November 2000.

Refereeing

The Mathematical Intelligencer, *The Journal of Combinatorial Optimization*, *Fundamenta Informaticae*, CiE, *Mathematical Logic Quarterly*

Selected Awards

- Natural Sciences and Engineering Research Council Postdoctoral Fellowship, 2005-2007

- Walter C. Sumner Memorial Fellowship, 2004-2005

- Natural Sciences and Engineering Research Council (Canada) PGS-B Scholarship, 2000-2002; PGS-A Scholarship, 1998-2000

- The Gold Medal in Computing Science, U of Alberta, 1998

- The Dean's Silver Medal for Science, U of Alberta, 1998

- An SHL Systemhouse President's award for education and technology, U of Alberta, 1997

- Member of winning team, 1997 ACM Mountain Region Scholastic Programming Contest and 8th place team, 1998 World Finals

- The Terence Holowach Memorial Prize from the Department of Computing Science, University of Alberta, 1996

- The Cyril G. Wates Memorial Prize for achievement in first year algebra, U of Alberta, 1995

- Gold and silver medals, the Sir Winston S. Churchill parliamentary debate competition

Industrial Experience

- **Software Developer**, IBM Canada Toronto Laboratory, May-August 1998. Primary developer on a project to produce an automated tool to select optimal or near-optimal indexes for a relational database, given a workload of queries and constraints. The resulting Index Advisor became a significant part of the performance optimization facilities of DB2.

- **Junior Programmer**, The ESYS Corporation, May-August 1997. Developed IMAP and IMSP servers on 10 UNIX platforms.

- **Junior Programmer**, Integrated Systems Applications (ISA) Corp., May-August 1995, May-August 1996. In-house system administration and network setup, troubleshooting and software testing for various clients.

Selected Extracurricular Activities

- Competitive debater since high school, contestant in 1997/1998 World Universities Debating Championship in Athens, Greece

- Avid juggler, SCUBA diver, squash player

References (more available upon request)

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   Distinguished University Professor
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   University of Toronto
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2. Jan Krajíček
   Professor
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4. Samuel Buss
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