

Karolina Sołtys

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Scientific Interests

- structural complexity, barriers in complexity theory, circuit lower bounds, communication complexity
- approximation algorithms, hardness of approximation, fixed parameter tractability
- theory of computation, logic
- discrete mathematics, graph theory

Education

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| 2010 | Graduate Record Examinations Verbal: 570/80%, Quantitative: 800/94%, Analytical Writing: 4.0/45%, Subject - Computer Science: 880/99% |
| 2010- | Parisian Master of Research in Computer Science program at Ecole Polytechnique, Palaiseau Currently in 2nd year of the program, expected graduation date: July 2011 Attending 9 graduate courses in theoretical computer science |
| 2006- | Computer Science at the University of Warsaw Currently in 5th year of the program, expected graduation date: June 2011 Attended 5 undergraduate and 11 graduate courses in theoretical computer science, 6 undergraduate courses in mathematics and 16 undergraduate systems/programming courses GPA: 4.54/5.0; GPA of theoretical computer science courses: 5.0/5.0 |
| 2005-2006 | Participant of a programme for highly gifted students of the Polish Children's Fund Participated in academic-level courses in Computer Science and Mathematics |
| 2003-2006 | 1st Secondary School in Lublin, mathematics and computer science profile |

Research Experience

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| Summer 2011 | Research intern for Google Research in a team working in combinatorial optimization Will be working on determining the complexity of certain versions of constraint satisfaction problem and on devising exact and approximate algorithms. |
| Spring 2011 | Research intern at the Max Planck Institute in Saarbrücken Will be working with Prof. Manindra Agrawal on several problems related to the Isomorphism Conjecture. |
| 2010 | “A note on the hardness of Median in the synchronized bit model” draft version: http://students.mimuw.edu.pl/~ksoltys/median.pdf |
| 2010-2011 | Research intern at the Parisian Master of Research in Computer Science program Studying communication complexity in several new models of communication under the supervision of Prof. Iordanis Kerenidis |
| 2010 | “Scrabble is PSPACE-complete” draft version: http://students.mimuw.edu.pl/~ksoltys/scrabble.pdf |
| 2009-2010 | Researcher in a group studying hardness of subexponential approximation at the University of Warsaw, supervised by Prof. Łukasz Kowalik |

Professional Experience

- 2008–2009 | Software developer at the [Institute of Computer Science](#) of the Polish Academy of Sciences
Developed and implemented algorithms for processing parse trees.

Educational Activities

- 2006– | Founder and main organizer of a series of independent annual [Scientific Summer Schools](#) for highly gifted high school students
Since 2006 there have been six such workshops, with more than 140 high school participants tutored by about 40 students from several institutions, who have given more than 130 courses in various areas of mathematics, computer science and physics. During these workshops I have taught the following courses: “Introduction to Set Theory”, “Introduction to the Theory of Computation”, “The Greatest Equation Ever”, “Text Algorithms”, “Ant Colony Optimization and Other Metaheuristics”, “Algebraic Methods in Graph Theory”, “Algorithms in Computational Biology”, “Dynamic Algorithms”.
- 2007– | Volunteer for the Polish Children’s Fund as a tutor at scientific workshops for gifted high school students
Lecturing and grading homework in theoretical computer science.
- 2009– | President of Theoretical Computer Science Students Group of the University of Warsaw
Secretary of that group in the years 2007–2009. Organized a conference “Logic and its applications”, several educational events for students and authored the [Group’s website](#), which is also the first Polish portal for students and young researchers in the area of theoretical computer science.
- Spring 2010 | Coordinator and lecturer on a students’ seminar “Complexity theory” at the University of Warsaw

Conference Attendance

- Nov 2010 | Paper “SCRABBLE is PSPACE-complete” accepted to 29th Colloquium on Combinatorics, Saarbrücken
- Sep 2010 | Paper “KROPKI is PSPACE-complete” accepted to 3rd Polish Combinatorial Conference, Będlewo
- Aug 2010 | 11th Max Planck Advanced Course on the Foundations of Computer Science “Approximation Algorithms and Algorithmic Game Theory”, Saarbrücken
- Jun 2010 | Google Scholars’ Retreat, Zurich
- May 2010 | EIDMA minicourse Algebraic Optimization and Semidefinite Programming, Amsterdam
- May 2010 | Member of the organizing committee for the conference “[Logic and its Applications](#)”, Warsaw
- Feb 2010 | Logical Approaches to Barriers in Computing and Complexity, Greifswald
- Jun 2009 | 10th Logical Workshop “Computation, Semantic, Complexity”, Płonin
- Sep 2007 | 10th International Workshop for Young Mathematicians “Combinatorics”, Krakow

Awards & Achievements

- 2010–2011 | French government grant for studying in France
- 2010–2011 | Ecole Polytechnique scholarship
- 2010 | Finalist of the Google Anita Borg Memorial Scholarship EMEA 2010
- 2007–2008 | Scholarship for academic performance
- 2007, 2008 | World semifinalist of two editions of Imagine Cup Algorithm contest (one of 200 semifinalists)
- 2006 | Scholarship of the Ministry of Education
- 2006 | 2nd place at the 49th Polish Astronomy Olympiad
- 2006 | Finalist at the 57th Polish Mathematical Olympiad
- 2006 | Finalist at the 36th Polish Literature and Language Olympiad (linguistics profile)
- 2004 | Finalist at the 28th English Language Olympiad

Other Skills

- fluent Polish (native language), English (CPE, TOEFL iBT: 110/120), French (DALF) and Italian (CELI 3), good knowledge of German (ZD), good passive knowledge of Spanish
- excellent programming skills, very good knowledge of several programming languages and technologies

Other Interests

- literature
- go, bridge

References

- Prof. Iordanis Kerenidis,
LIAFA, University Paris 7,
jkeren@lri.fr
- Prof. Krzysztof Diks,
University of Warsaw,
diks@mimuw.edu.pl
- Prof. Łukasz Kowalik,
University of Warsaw,
kowalik@mimuw.edu.pl
- Prof. Mikołaj Bojańczyk,
University of Warsaw,
bojan@mimuw.edu.pl

Relevant Coursework ¹

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| Fall 2010 | Distributed algorithms and fault tolerance Distributed algorithms for the networks Game theory techniques in computer science Advanced algorithmics and complexity Quantum Information and Applications Using randomness in computer science Constraint Satisfaction Problems: algorithms and complexity Algorithmic aspects of combinatorics Theory of computations | | |
| Spring 2010 | Algorithmics – Master Seminar Finite model theory | 5 | |
| Fall 2009 | Algorithmics – Master Seminar Automata and Logic Information Theory | 5 5 | |
| Spring 2009 | Dynamic Algorithms | 5 | |
| Fall 2008 | Computational Geometry Introduction to Computational Biology Selected problems in Discrete Mathematics | 5 5 5 | |
| Spring 2008 | Algorithmic Graph Theory Complexity of Text Algorithms | 5 5 | |
| Fall 2007 | Algebra I | 4 | |
| Spring 2007 | Algorithmics Computational Complexity Linear algebra and geometry II Mathematical Logic Theory of Computation | 5 5 4 4.5 5 | |
| Fall 2006 | Algorithms and Data Structures Automata Theory, Languages and Computations Discrete Mathematics I Linear algebra and geometry I Practical Algorithmics The Fundamentals of Set Theory | 5 5 5 5 5 4.5 | |

¹Only courses relevant to Theoretical Computer Science are listed. Apart from these courses, during my studies at Warsaw University I have taken 16 undergraduate systems/programming courses and some courses in mathematics. Fall 2010 courses were taken at the Parisian Master of Research in Computer Science program and will be graded in March 2011. All the other courses were taken at Warsaw University. Grading scale at Warsaw University: 2.0 (lowest) – 5.0 (highest).