

Kiril Solovey

CURRICULUM VITÆ

PERSONAL INFORMATION

Citizenship: Israeli
Address: Schreiber 18m, School of Computer Science, Tel Aviv University, Israel
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Research Interests: Robot motion planning, sampling-based algorithms, multi-robot motion planning, computational geometry

EDUCATION

2013 – present School of Computer Science, Tel-Aviv University, Israel
Ph.D. in Computer Science.
Dissertation Topic: “Multi-Robot Motion Planning: Theory and Practice”
Advisor: Dan Halperin

2010 – 2013 School of Computer Science, Tel-Aviv University, Israel
M.Sc. in Computer Science, **magna cum laude**.
Dissertation Topic: “ k -Color Multi-Robot Motion Planning”
Advisor: Dan Halperin

2007 – 2010 School of Computer Science, Tel-Aviv University, Israel
B.Sc. in Computer Science, **magna cum laude**.

TEACHING EXPERIENCE

2012–present Teaching assistant in the course Computer Structure, *Tel Aviv University* (TAU).
2013 Teaching assistant of the Workshop in Robot Motion Planning, TAU.
2009–2012 Grader in the courses Computer Structure, Algorithmic Robotics and Motion Planning, Programming for Engineering, TAU.

HONORS AND AWARDS

- 2015-18** **Clore Scholars Programme** (87,000 \$), *Clore Israel Foundation*
- 2017** **Best paper award**, for “Scalable Asymptotically-Optimal Multi-Robot Motion Planning”, *International Symposium on Multi-Robot and Multi-Agent Systems*
- 2016** List of top 100 teaching assistants, *Tel Aviv University* (TAU)
- 2016** Excellence in teaching award, School of Computer Science, TAU
- 2015** Rector’s excellence in teaching award, TAU
- 2015** **Best student paper award**, and finalist for best paper, for “On the Hardness of Unlabeled Multi-Robot Motion Planning”, *Robotics: Science and Systems*
- 2014,15** Internship Grant, Ministry of Science, Technology, and Space, Israel
- 2015** Deutsch Prize, *School of Computer Science, TAU*
- 2011,13,14** Excellence Scholarship, *Selim and Rachel Benin Scholarship Fund*.
- 2014** Aharon and Ephraim Katzir Travel Grant of the *Batsheva de Rothschild Fund*
- 2014** Prof. Rahamimoff Travel Grant for Young Scientists of the *US-Israel Binational Science Foundation* (declined)
- 2012** Intel Award, *Intel*, Israel
- 2011** Excellence Scholarship in Memory of Brucker Haim, *Faculty of Exact Sciences, TAU*
- 2010** Yearly Stipend for Promising M.Sc. Students, *School of Computer Science, TAU*
- 2010** Dean’s Honor List, *Faculty of Exact Sciences, TAU*
- 2009** Excellence Award for B.Sc. students, *School of Computer Science, TAU*

PUBLICATIONS

JOURNAL PAPERS

- **Kiril Solovey** and Dan Halperin,
“On the Hardness of Unlabeled Multi-Robot Motion Planning.”
Special issue (**invited**), *International Journal of Robotics Research*, 35(14): 1750-1759, 2016.
- Oren Salzman, **Kiril Solovey** and Dan Halperin,
“Motion Planning for Multi-Link Robots by Implicit Configuration-Space Tiling.”
IEEE Robotics and Automation Letters, 1(2): 760-767, 2016.
- **Kiril Solovey***, Oren Salzman* and Dan Halperin (* equal contribution),
“Finding a Needle in an Exponential Haystack: Discrete RRT for Exploration of Implicit Roadmaps in Multi-Robot Motion Planning.”
Special issue (**invited**), *International Journal of Robotics Research*, 35(5): 501-513, 2016.
- Aviv Adler, Mark de Berg, Dan Halperin and **Kiril Solovey** (alphabetical order),
“Efficient Multi-Robot Motion Planning for Unlabeled Discs in Simple Polygons.”
Special issue (**invited**), *Transactions on Automation Science and Engineering*, 12(4): 1309-1317, 2015.
- **Kiril Solovey** and Dan Halperin,
“ k -Color Multi-Robot Motion Planning.”
Special issue (**invited**), *International Journal of Robotics Research*, 33(1): 82-97, 2014.

BOOK CHAPTERS

- Dan Halperin, Lydia Kavraki and **Kiril Solovey** (alphabetical order), “Robotics”, in the *Handbook of Discrete and Computational Geometry*, Eds. Jacob E. Goodman, Joseph O’Rourke, and Csaba D. Toth, CRC Press LLC, to appear, 2016.

PEER-REVIEWED CONFERENCE PROCEEDINGS

- Andrew Dobson, **Kiril Solovey**, Rahul Shome, Dan Halperin, and Kostas E. Bekris, “Scalable Asymptotically-Optimal Multi-Robot Motion Planning.” In *International Symposium on Multi-Robot and Multi-Agent Systems*, **best paper award**, 2017.
- **Kiril Solovey** and Dan Halperin, “Efficient sampling-based bottleneck pathfinding over cost maps.” In *International Conference on Intelligent Robots and Systems*, Vancouver, BC, Canada, 2017.
- Aviel Atias, **Kiril Solovey** and Dan Halperin, “Effective Metrics for Multi-Robot Motion-Planning.” In *Robotics: Science and Systems*, MIT, MA, USA, 2017. **Invited** to a special issue of *International Journal of Robotics Research*.
- **Kiril Solovey** and Dan Halperin, “Asymptotically-Optimal Bottleneck Pathfinding with Applications to Fréchet-Type Optimization.” In *European Symposium on Algorithms*, 76:1-76:16, Aarhus, Denmark, 2016.
- **Kiril Solovey**, Oren Salzman and Dan Halperin, “New Perspective on Sampling-Based Motion Planning via Random Geometric Graphs.” In *Robotics: Science and Systems*, University of Michigan, MI, USA, 2016.
- **Kiril Solovey**, Jingjin Yu, Or Zamir and Dan Halperin, “Motion Planning for Unlabeled Discs with Optimality Guarantees.” In *Robotics: Science and Systems*, Sapienza University of Rome, Italy, 2015.
- **Kiril Solovey** and Dan Halperin, “On the Hardness of Unlabeled Multi-Robot Motion Planning.” In *Robotics: Science and Systems*, **finalist for best paper, and winner of best student paper**, Sapienza University of Rome, Italy, 2015. Also in *International Symposium on Computational Geometry, Young Researchers Forum*, Eindhoven, The Netherlands, 2015.
- Aviv Adler, Mark de Berg, Dan Halperin and **Kiril Solovey** (alphabetical order), “Efficient Multi-Robot Motion Planning for Unlabeled Discs in Simple Polygons.” In *Workshop on Algorithmic Foundations of Robotics*, p 1-17, Istanbul, Turkey, 2014. Also in *European Workshop on Computational Geometry*, Ein Gedi, Israel, 2014.
- **Kiril Solovey***, Oren Salzman* and Dan Halperin (* equal contribution), “Finding a Needle in an Exponential Haystack: Discrete RRT for Exploration of Implicit Roadmaps in Multi-Robot Motion Planning.” In *Workshop on Algorithmic Foundations of Robotics*, p 591-607, Istanbul, Turkey, 2014.

- **Kiril Solovey** and Dan Halperin,
“ k -Color Multi-Robot Motion Planning.”
In *Workshop on Algorithmic Foundations of Robotics*, p 191-207, Cambridge, MA, USA, 2012.

DISSERTATIONS

- **Kiril Solovey**,
“ k -Color Multi-Robot Motion Planning.”
Master’s thesis, *Tel Aviv University*, February 2013, Advisor: Dan Halperin.

MANUSCRIPTS UNDER REVIEW

- Aviel Atias, **Kiril Solovey**, Oren Salzman, and Dan Halperin,
“Effective Metrics for Multi-Robot Motion-Planning.”
Special issue (**invited**), *International Journal of Robotics Research*, 2017.
- **Kiril Solovey**, Oren Salzman and Dan Halperin,
“New Perspective on Sampling-Based Motion Planning via Random Geometric Graphs.”
Special issue (**invited**), *International Journal of Robotics Research*, 2016.

TECHNICAL REPORTS

- **Kiril Solovey** and Michal Kleinbort,
“The Critical Radius in Sampling-based Motion Planning.”
arXiv, 2017.

RESEARCH VISITS

- 2017** Microsoft Research, Theory Group, led by Yuval Peres,
Redmond, WA, USA (two weeks).
- 2016** IEEE RAS Summer School on Multi-Robot Systems,
National University of Singapore.
- 2015** Workshop on Geometric Problems on Sensor Networks and Robots,
IBM Research, Yorktown Heights, NY, USA.
- 2014** Kavraki Lab, led by Lydia Kavraki, Rice University,
Houston, TX, USA (three weeks).
- 2014** PRACSYS Group, led by Kostas Bekris,
Rutgers University, Piscataway, NJ, USA (one week).

TALKS AND PRESENTATIONS

CONFERENCE AND WORKSHOP TALKS

- Presented “Efficient sampling-based bottleneck pathfinding over cost maps”
International Conference on Intelligent Robots and Systems, Vancouver, BC, Canada, September 2017.
- Gave a talk titled: “Applications of Random Geometric Graphs in Robot Motion Planning.”
Workshop on Random Geometric Graphs and their Applications in Complex Networks, Banff, Alberta, Canada, November 2016.
- Presented “Asymptotically-Optimal Bottleneck Pathfinding with Applications to Fréchet-Type Optimization.”
European Symposium on Algorithms, Aarhus, Denmark, August 2016.
- Presented “New Perspective on Sampling-Based Motion Planning via Random Geometric Graphs.” *Robotics: Science and Systems*, Ann Arbor, MI, USA, June 2016.
- Presented “On the Hardness of Unlabeled Multi-Robot Motion Planning.”
Robotics: Science and Systems, Rome, Italy, July 2015.
- Presented “Motion Planning for Unlabeled Discs with Optimality Guarantees.”
Robotics: Science and Systems, Rome, Italy, July 2015.
- Presented “On the Hardness of Unlabeled Multi-Robot Motion Planning.”
International Symposium on Computational Geometry, Young Researchers Forum, Eindhoven, The Netherlands, June 2015.
- Presented “Efficient Multi-Robot Motion Planning for Unlabeled Discs in Simple Polygons.”
Workshop on Algorithmic Foundations of Robotics, Istanbul, Turkey, August 2014.
- Presented “Finding a Needle in an Exponential Haystack: Discrete RRT for Exploration of Implicit Roadmaps in Multi-Robot Motion Planning.”
Workshop on Algorithmic Foundations of Robotics, Istanbul, Turkey, August 2014.
- Presented “Efficient Multi-Robot Motion Planning for Unlabeled Discs in Simple Polygons.”
European Workshop on Computational Geometry, Ein Gedi, Israel, March 2014.
- Presented “ k -Color Multi-Robot Motion Planning.”
Israeli Conference on Robotics, Tel Aviv, Israel, November 2013.
- Gave a talk titled: “Pebbles, Manifolds and Multi-Robot Motion Planning .”
Computational Geometry Learning Research Workshop, Berlin, Germany, December 2012.
- Presented “ k -Color Multi-Robot Motion Planning.”
Workshop on Algorithmic Foundations of Robotics, Cambridge, MA, USA, June 2012.

INVITED TALKS

- Gave a talk titled: “The critical radius in sampling-based motion planning”
Carnegie Mellon University, Robotics Institute, Foundations of Robotics Seminar, Pittsburgh, PA, USA, October, 2017.
- Gave a talk titled: “The critical radius in sampling-based motion planning”
Stanford University, Department of Aeronautics and Astronautics, Autonomous Systems Laboratory, Stanford, CA, USA, October, 2017.
- Gave a talk titled: “The critical radius in sampling-based motion planning”
University of British Columbia, School of Computer Science, Vancouver, BC, Canada, September, 2017.
- Gave a talk titled: “Introduction to Sampling-Based Robot Motion Planning.”
Microsoft Research, Theory Group, Redmond, WA, USA, April 2017.
- Gave a talk titled: “Recent Progress in Multi-Robot Motion Planning.”
Courses “Introduction to Robotics” and “Multi-Robot Systems”, Computer Science Department, Bar Ilan University, Ramat Gan, Israel, April 2015.
- Gave a talk titled: “Recent Progress in Multi-Robot Motion Planning.”
Group Seminar at Kavraki Lab, Rice University, Houston, TX, USA, September 2014.
- Gave a talk titled: “Recent Progress in Multi-Robot Motion Planning.”
Group Seminar at PRACSYS Group, Rutgers University, Piscataway, NJ, USA, September 2014.

COMMUNITY SERVICE

CONFERENCE REVIEWER

Robotics: Science and Systems; IEEE/RSJ International Conference on Intelligent Robots and Systems; IEEE International Conference on Robotics and Automation; International Symposium on Computational Geometry; International Workshop on the Algorithmic Foundations of Robotics; European Symposium on Algorithms; International Colloquium on Automata, Languages and Programming.

JOURNAL REVIEWER

IEEE Transactions on Automation Science and Engineering; IEEE Robotics and Automation Letters; International Journal of Robotics Research; Journal of Computational Geometry; IEEE Transactions on Industrial Informatics.

EXTRACURRICULAR ACTIVITIES

- 2008–present** Maintained a personal website with study materials for Computer Science students.
- 2008–2009** Mentor for freshman students, School of Computer Science.
- 2009** Tutor for children in primary school, Perach Program.

MILITARY SERVICE

- 2004–2007** Full mandatory army service, Human Resources Branch, Israeli Defence Force.