# Krzysztof Onak

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*Current position*

**Simons Postdoctoral Fellow at Carnegie Mellon University**, 2010–2012

*Education*

- **Massachusetts Institute of Technology**, Sep 2005–Aug 2010
  **Doctor of Philosophy in Computer Science**
  Thesis title: "New Sublinear Methods in the Struggle Against Classical Problems"
  Advisor: Prof. Ronitt Rubinfeld
- **University of Warsaw**, Oct 2000–Jun 2005

  **Master of Science in Computer Science**, June 2005
  Thesis title: "Searching in Graphs—Generalization of Binary Search"
  Advisor: Prof. Krzysztof Diks

  **Bachelor of Science in Mathematics**, November 2004
  Thesis title: "Testing Fundamentality of a System of Units in $\mathcal{U}(\mathbb{Z}C_p)$"
  Advisor: Prof. Zbigniew Marciniak

  **Bachelor of Science in Computer Science**, October 2003

*Research interests*

Algorithms for massive data sets, sublinear-time algorithms, property testing, streaming, graph algorithms.

*Publications*

- Krzysztof Onak, Dana Ron, Michal Rosen, Ronitt Rubinfeld
  **A Near-Optimal Sublinear-Time Algorithm for Approximating the Minimum Vertex Cover Size**
  The 23rd Annual ACM-SIAM Symposium on Discrete Algorithms (SODA 2012)
- Artur Czumaj, Morteza Monemizadeh, Krzysztof Onak, Christian Sohler
  **Planar Graphs: Random Walks and Bipartiteness Testing**
  The 52nd Annual Symposium on Foundations of Computer Science (FOCS 2011)
- Alexandr Andoni, Robert Krauthgamer, Krzysztof Onak
  **Streaming Algorithms via Precision Sampling**
  The 52nd Annual Symposium on Foundations of Computer Science (FOCS 2011)
- Alan Edelman, Avinatan Hassidim, Huy N. Nguyen, Krzysztof Onak
  **An Efficient Partitioning Oracle for Bounded-Treewidth Graphs**
  The 15th International Workshop on Randomization and Computation (RANDOM 2011)
- Alexandr Andoni, Robert Krauthgamer, Krzysztof Onak
  **Polylogarithmic Approximation for Edit Distance and the Asymmetric Query Complexity**
  The 51st Annual Symposium on Foundations of Computer Science (FOCS 2010)
  Invited to the Special Issue of SICOMP on FOCS 2010, declined.
- Krzysztof Onak, Ronitt Rubinfeld
  **Maintaining a Large Matching or a Small Vertex Cover**
  The 42nd ACM Symposium on Theory of Computing (STOC 2010)
- Avinatan Hassidim, Jonathan A. Kelner, Huy N. Nguyen, Krzysztof Onak
  **Local Graph Partitions for Approximation and Testing**
  The 50th Annual Symposium on Foundations of Computer Science (FOCS 2009)
- Krzysztof Onak
  **Testing Distribution Identity Efficiently**
  A short note on arXiv (arXiv:0910.3243 [cs.DS]), Oct 2009

- Andrew McGregor, Krzysztof Onak, Rina Panigrahy
  **The Oil Searching Problem**
  The 17th Annual European Symposium on Algorithms (ESA 2009)
- Alexandr Andoni, Piotr Indyk, Krzysztof Onak, Ronitt Rubinfeld
  **External Sampling**
  The 36th International Colloquium on Automata, Languages and Programming (ICALP 2009)
- Alexandr Andoni, Krzysztof Onak
  **Approximating Edit Distance in Near-Linear Time**
  The 41st ACM Symposium on Theory of Computing (STOC 2009)
  The special issue of SICOMP on STOC 2009, to appear
- Huy N. Nguyen, Krzysztof Onak
  **Constant-Time Approximation Algorithms via Local Improvements**
  The 49th Annual Symposium on Foundations of Computer Science (FOCS 2008)
- Nicholas Harvey, Jelani Nelson, Krzysztof Onak
  **Sketching and Streaming Entropy via Approximation Theory**
  The 49th Annual Symposium on Foundations of Computer Science (FOCS 2008)
- Alexandr Andoni, Andrew McGregor, Krzysztof Onak, Rina Panigrahy
  **Better Bounds for Frequency Moments in Random-Order Streams**
  A short note on arXiv (arXiv:0808.2222 [cs.DS]), Aug 2008
- Krzysztof Onak
  **Testing Properties of Sets of Points in Metric Spaces**
  The 35th International Colloquium on Automata, Languages and Programming (ICALP 2008)
- Krzysztof Onak, Anastasios Sidiropoulos
  **Circular Partitions with Applications to Visualization and Embeddings**
  The 24th Annual ACM Symposium on Computational Geometry (SoCG 2008)
- Shay Mozes, Krzysztof Onak, Oren Weimann
  **Finding an Optimal Tree Searching Strategy in Linear Time**
  The 19th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA 2008)
- Ilias Diakonikolas, Homin K. Lee, Kevin Matulef, Krzysztof Onak, Ronitt Rubinfeld, Rocco A. Servedio, Andrew Wan
  **Testing for Concise Representations**
  The 48th Annual Symposium on Foundations of Computer Science (FOCS 2007)
- David Karger, Krzysztof Onak
  **Polynomial Approximation Schemes for Smoothed And Random Instances of Multidimensional Packing Problems**
  The 18th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA 2007)
- Krzysztof Onak, Paweł Parys
  **Generalization of Binary Search: Searching in Trees and Forest-Like Partial Orders**
  The 47th Annual Symposium on Foundations of Computer Science (FOCS 2006)

*Past work experience*

- **Teaching Assistant for "Introduction to Algorithms" at MIT**, Fall 2009
  Taught recitations. Prepared and graded problem sets and quizzes.
- **Research Intern at Microsoft Research Silicon Valley**, May–Aug 2008
  Worked on decision optimization and streaming algorithms.
- **Teaching Assistant for "Randomness and Computation" at MIT**, Spring 2008
  Prepared and taught a few lectures. Prepared problem sets.
- **Research Intern at Google Research, New York City**, Jun–Aug 2007
  Worked on parallel algorithms. In particular, developed techniques for efficient parallel agglomerative clustering. The algorithms can be implemented in any parallel architecture similar to Google's MapReduce.

- **Teaching Assistant at the University of Warsaw**, 2003–2005

  Taught recitations and programming labs (in total 150 hours). Prepared and graded problem sets, exams and final projects. Courses: Algorithms and Data Structures, Advanced Algorithms, Introduction to Programming, Concurrent Programming.

- **Summer Intern at Microsoft Corporation**, Summer 2004

  Worked as a software design engineer in the Windows CE Networking group. Developed remote control over Bluetooth, and implemented an audio codec.

- **Independent Programmer at Collabo Technology**, Summer 2003

  Worked on remote collaboration software. Designed and implemented, among other things, persistent data structures and tunneling over HTTP.

- **Member of the Jury of Polish Olympiad in Informatics**, 2001–2005

  Prepared problems, key solutions and test data sets. Edited and typeset books with solution descriptions. Gave lectures at training camps.

- **Tutor at Workshops and Camps of Polish Children's Fund**, 2001–2005

  Gave lectures for gifted high school students.

*Awards*

- **Simons Postdoctoral Fellowship**, 2010-2012
- **Symantec Fellowship**, Fall 2008
- **Akamai Presidential Fellowship**, 2005–2006
- **Polish Minister of Education Scholarship**, 2003–2005
- **Comarch R&D Center Scholarship**, 2003–2004
- **Diploma of the Polish Minister of Foreign Affairs for Exceptional Contribution to the Promotion of Poland in the World**, Sep 2003
- **World Champion in ACM International Collegiate Programming Contest**, Mar 2003
- **International Olympiad in Informatics: gold medal** (Sep 2000), **bronze medal** (Oct 1999)

*Program committees*

- The 24th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA 2013)
- The 20th Annual European Symposium on Algorithms (ESA 2012), Design and Analysis Track
- The 36th International Symposium on Mathematical Foundations of Computer Science (MFCS 2011)

*Talks (except conference talks)*

- *Testing for Concise Representations*, University of Warsaw, Dec 2006
- *Parallel Hierarchical Agglomerative Clustering*, Google NYC, Aug 2007
- *Testing for Concise Representations*, Algorithms and Complexity Seminar at MIT, Oct 2007
- *Testing for Concise Representations*, Brown University, Nov 2007
- *Sketching and Streaming Entropy via Approximation Theory*, Microsoft Research Silicon Valley, Jun 2008
- *The Oil Searching Problem*, Microsoft Research Silicon Valley, Aug 2008
- *Constant-Time Approximation Algorithms via Local Improvements*, Dagstuhl Seminar on Sublinear Algorithms, Aug 2008
- *Constant-Time Approximation Algorithms via Local Improvements*, Theory Lunch at Princeton University, Sep 2008
- *Constant-Time Approximation Algorithms via Local Improvements*, Algorithms and Complexity Seminar at MIT, Sep 2008
- *Constant-Time Approximation Algorithms via Local Improvements*, University of Michigan, Sep 2008
- *Sketching and Streaming Entropy via Approximation Theory*, Symantec Research in Culver City, Dec 2008

- *Sketching and Streaming Entropy via Approximation Theory*, AGH University of Science and Technology, Dec 2008
- *Constant-Time Approximation Algorithms via Local Improvements*, University of Warsaw, Dec 2008
- *Sublinear Graph Approximation Algorithms*, Weizmann Institute, Mar 2009
- *Fat Partitions with Applications to Visualization and Embeddings*, Algorithms Seminar at Tel Aviv University, Mar 2009
- *Sketching and Streaming Entropy via Approximation Theory*, Combinatorics Seminar at Tel Aviv University, Apr 2009
- *Approximating Edit Distance in Near-Linear Time*, Haifa University, Apr 2009
- *Sublinear Graph Approximation Algorithms*, Bar Ilan University, May 2009
- *Approximating Edit Distance in Near-Linear Time*, Hebrew University, May 2009
- *Sublinear Graph Approximation Algorithms*, Network Algorithms Seminar at Tel Aviv University, May 2009
- *Sublinear Graph Approximation Algorithms*, Dortmund University of Technology, Aug 2009
- *Sublinear Graph Approximation Algorithms*, Pennsylvania State University, Sep 2009
- *Sublinear Graph Approximation Algorithms*, INFORMS Annual Meeting 2009, San Diego, Oct 2009
- *Approximate Pattern Matching and the Query Complexity of Edit Distance*, Workshop on Algorithms for Processing Massive Data Sets, IIT Kanpur, Dec 2009
- *External Sampling*, ITCS Mini-Workshop on Property Testing, Beijing, Jan 2010
- *Sublinear Graph Approximation Algorithms*, ITCS Mini-Workshop on Property Testing, Beijing, Jan 2010
- *The Query Complexity of Edit Distance*, ITCS Mini-Workshop on Property Testing, Beijing, Jan 2010
- *Sublinear Graph Approximation Algorithms*, Algorithms and Randomness Center, Georgia Tech, Feb 2010
- *Sublinear Graph Approximation Algorithms*, Madhu's Group, Microsoft Research New England, Apr 2010
- *On a Connection Between Distributed Algorithms and Sublinear-Time Algorithms*, Theory of Distributed Systems Seminar, Apr 2010
- *Polylogarithmic Approximation for Edit Distance and the Asymmetric Query Complexity*, Theory Seminar, Carnegie Mellon University, Sep 2010
- *Polylogarithmic Approximation for Edit Distance and the Asymmetric Query Complexity*, Pennsylvania State University, Oct 2010
- *Polylogarithmic Approximation for Edit Distance and the Asymmetric Query Complexity*, University of Warsaw, Dec 2010
- *Sublinear Graph Approximation Algorithms*, Theory Lunch, Carnegie Mellon University, Jan 2011
- *A Near-Optimal Sublinear-Time Algorithm for Approximating the Minimum Vertex Cover Size*, Bertinoro Seminar on Sublinear Algorithm, May 2011
- *Fat Polygonal Partitions with Applications to Visualization and Embeddings*, Theory Lunch, Carnegie Mellon University, Nov 2011

*Scientific visits*

- Columbia University, Jun–Aug 2006
- Tel Aviv University, Feb–Jun 2009
- Dortmund University of Technology, Aug 2009