

Ali Kemal Sinop

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- RESEARCH INTERESTS ◇ Combinatorial optimization, approximation algorithms and hardness of approximation, linear algebra, spectral graph theory.
- EDUCATION ◇ **Carnegie Mellon University**, Pittsburgh, PA.
Ph.D. in Computer Science. August 2007 – May 2012.
Thesis title: Graph Partitioning and Semi-definite Programming Hierarchies.
Advised by: Venkatesan Guruswami.
- ◇ **University of Pennsylvania**, Philadelphia, PA.
M.S.E. in Computer and Information Science, September 2004 – August 2005.
- ◇ **Bilkent University**, Turkey.
B.Sc. in Computer Engineering, September 2000 – June 2004.
CGPA: 3.95/4.00 (Major: 4.00/4.00). Ranking: 2.
- EMPLOYMENT ◇ **Department of Computer Engineering, TOBB University of Economics and Technology**, Turkey.
Assistant Professor, September 2017 – current.
- ◇ **Department of Computer Science, University of Illinois at Urbana-Champaign**, IL.
Research Scholar, November 2015 – July 2017.
- ◇ **Simons Institute for the Theory of Computing, UC Berkeley**, CA.
Research Fellow, August 2014 – August 2015.
- ◇ **School of Mathematics, Institute for Advanced Study**, Princeton, NJ.
Postdoctoral Researcher, June 2013 – August 2014.
- ◇ **Center for Computational Intractability, Princeton University**, NJ.
Postdoctoral Researcher, June 2012 – May 2013.
- ◇ **Siemens Corporate Research**, Princeton, NJ.
Technical Associate, September 2005 – August 2007.
Supervised by: Dr. Leo Grady.
 · Worked on various graph partitioning algorithms for image segmentation.
- TEACHING EXPERIENCE ◇ (Graduate) Theoretical Foundations of Data Science, Fall 2018.
- ◇ (Undergraduate) Linear Algebra and Its Applications, Fall 2018.
- ◇ (Graduate) Theory of Computation, Summer 2018.
- ◇ (Undergraduate) Automata Theory and Finite Languages, Spring 2018.
- PUBLICATIONS Please note that the authors of theory papers are listed in **alphabetical order** as per the field convention.
- ◇ Ali Kemal Sinop, “A Faster Algorithm for Clustering with Spectral Norm and Rounding Subspaces”, under submission.
- ◇ Alexandra Kolla, Ioannis Koutis, Vivek Madan and Ali Kemal Sinop, “Spectrally Robust Graph Isomorphism”, to appear in 45th International Colloquium on Automata, Languages, and Programming (ICALP), Prague, Czech Republic, July 9-13, 2018.
- ◇ Pranjali Awasthi, Moses Charikar, Ravishankar Krishnaswamy, Ali Kemal Sinop, “Spectral Embedding of k-Cliques, Graph Partitioning and k-Means”, In 7th Innovations in Theoretical Computer Science, ITCS 2016, Cambridge, Massachusetts, USA, January 14-16, 2016.

- ◇ Ali Kemal Sinop, “How to Round Subspaces: A New Spectral Clustering Algorithm” In Twenty-Seventh Annual ACM-SIAM Symposium on Discrete Algorithms, SODA 2016, Arlington, Virginia, USA, January 10-12, 2016.
- ◇ Venkatesan Guruswami, Ali Kemal Sinop, Yuan Zhou, “Constant Factor Lasserre Integrality Gaps for Graph Partitioning Problems”, In SIAM Journal on Optimization, vol. 24, no. 4, pp. 1698-1717, 2014.
- ◇ Venkatesan Guruswami, Ali Kemal Sinop, “Improved Inapproximability Results for Maximum k -Colorable Subgraph”, In Theory of Computing, vol. 9, pp. 413-435, 2013.
- ◇ Pranjali Awasthi, Moses Charikar, Ravishankar Krishnaswamy, Ali Kemal Sinop, “The Hardness of Approximation of Euclidean k -Means”, In 31st International Symposium on Computational Geometry, SoCG 2015, June 22-25, 2015, Eindhoven, The Netherlands, pp. 754-767, 2015.
- ◇ Venkatesan Guruswami, Ali Kemal Sinop, “Approximating Non-Uniform Sparsest Cut Via Generalized Spectra”, In Proceedings of the Twenty-Fourth Annual ACM-SIAM Symposium on Discrete Algorithms, SODA 2013, New Orleans, Louisiana, USA, January 6-8, 2013, pp. 295-305, 2013.
- ◇ Sanjeev Arora, Rong Ge, Ali Kemal Sinop, “Towards a Better Approximation for Sparsest Cut?”, In 54th Annual IEEE Symposium on Foundations of Computer Science, FOCS 2013, 26-29 October, 2013, Berkeley, CA, USA, pp. 270-279, 2013.
- ◇ Venkatesan Guruswami, Ali Kemal Sinop, “Faster SDP Hierarchy Solvers for Local Rounding Algorithms”, In 53rd Annual IEEE Symposium on Foundations of Computer Science, FOCS 2012, New Brunswick, NJ, USA, October 20-23, 2012, pp. 197-206, 2012.
- ◇ Ali Kemal Sinop, “Graph Partitioning and Semi-definite Programming Hierarchies”, PhD thesis, Carnegie Mellon University, May 2012.
- ◇ Venkatesan Guruswami, Ali Kemal Sinop, “Optimal column-based low-rank matrix reconstruction”, In Proceedings of the Twenty-Third Annual ACM-SIAM Symposium on Discrete Algorithms, SODA 2012, Kyoto, Japan, January 17-19, 2012, pp. 1207-1214, 2012.
- ◇ Venkatesan Guruswami, Ali Kemal Sinop, “Lasserre Hierarchy, Higher Eigenvalues, and Approximation Schemes for Graph Partitioning and Quadratic Integer Programming with PSD Objectives”, In IEEE 52nd Annual Symposium on Foundations of Computer Science, FOCS 2011, Palm Springs, CA, USA, October 22-25, 2011, pp. 482-491, 2011.
- ◇ Venkatesan Guruswami, Ali Kemal Sinop, “The complexity of finding independent sets in bounded degree (hyper)graphs of low chromatic number”, In Proceedings of the Twenty-Second Annual ACM-SIAM Symposium on Discrete Algorithms, SODA 2011, San Francisco, California, USA, January 23-25, 2011, pp. 1615-1626, 2011.
- ◇ Venkatesan Guruswami, Ali Kemal Sinop, “Improved Inapproximability Results for Maximum k -Colorable Subgraph”, In Approximation, Randomization, and Combinatorial Optimization. Algorithms and Techniques, 12th International Workshop, APPROX 2009, and 13th International Workshop, RANDOM 2009, Berkeley, CA, USA, August 21-23, 2009. Proceedings, pp. 163-176, 2009.
- ◇ Leo Grady, Ali Kemal Sinop, “Fast approximate RandomWalker segmentation using eigenvector precomputation”, In 2008 IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR 2008), 24-26 June 2008, Anchorage, Alaska, USA, 2008.
- ◇ Ali Kemal Sinop, Leo Grady, “A Seeded Image Segmentation Framework Unifying Graph Cuts And Random Walker Which Yields A New Algorithm”, In IEEE 11th International Conference on Computer Vision, ICCV 2007, Rio de Janeiro, Brazil, October 14-20, 2007, pp. 1-8, 2007.
- ◇ Ali Kemal Sinop, Leo Grady, “Uninitialized, Globally Optimal, Graph-Based Rectilinear Shape Segmentation The Opposing Metrics Method”, In IEEE 11th International Conference on Computer Vision, ICCV 2007, Rio de Janeiro, Brazil, October 14-20, 2007, pp. 1-8, 2007.
- ◇ Ali Kemal Sinop, Leo Grady, “Accurate Banded Graph Cut Segmentation of Thin Structures Using Laplacian Pyramids”, In Medical Image Computing and Computer-Assisted

Intervention - MICCAI 2006, 9th International Conference, Copenhagen, Denmark, October 1-6, 2006, Proceedings, Part II, pp. 896-903, 2006.

- ◇ Ali Kemal Sinop, Tolga Abaci, Ümit Akkuş, Attila Gürsoy, Uğur Gündükbay, “PHR: A Parallel Hierarchical Radiosity System with Dynamic Load Balancing,” In The Journal of Supercomputing 31(3): 249-263, 2005.
- ◇ Ediz Şaykol, Ali Kemal Sinop, Uğur Gündükbay, Özgür Ulusoy, Enis Çetin, “Content-based retrieval of historical Ottoman documents stored as textual images,” In IEEE Transactions on Image Processing 13(3): 314-325, 2004.

TECHNICAL
SKILLS

- ◇ C, C++, Matlab, Python, Java, Lisp, x86/64 assembly, OpenGL, L^AT_EX.

SERVICE

- ◇ Program Committee: RANDOM 2015.

SCHOLARSHIPS
AND AWARDS

- ◇ Awarded Fellowship from Carnegie Mellon University, School of Computer Science, Computer Science Department.
- ◇ Awarded University of Pennsylvania Dean’s Fellowship which includes stipend and tuition, 2004 – 2005.
- ◇ Awarded Bilkent University Full Scholarship which includes stipend and tuition, 2000-2004.
- ◇ Awarded TÜBİTAK (National Science and Technology Council of Turkey) Scholarship for Success in Informatics Olympiads which includes stipend, 2000 – 2004.
- ◇ Represented Turkey in 11th International Olympiads in Informatics, Antalya, Turkey, 1999.
- ◇ Won Bronze Medal in 7th Balkan Olympiads in Informatics, Ioanina, Greece, 1999.
- ◇ Won Silver Medal in 6th TÜBİTAK (National Science and Technology Council of Turkey) National Olympiads in Informatics, Ankara, Turkey, 1998.

REFERENCES

Sanjeev Arora
(mkelly@cs.princeton.edu)
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Princeton University.

Moses Charikar
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Professor of Computer Science
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Venkatesan Guruswami
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Professor of Computer Science
Carnegie Mellon University.