

CURRICULUM VITAE

A. ERDEM SARIYÜCE

(Updated in 12/17)

Computer Science and Engineering Department
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Research Interests

Graph mining, social network analysis, network science, stream processing, temporal network analysis, combinatorial scientific computing, distributed and parallel computing

Education

- **Ohio State University** Columbus, OH
Ph.D. in Computer Science and Engineering, 2015
 - Thesis title: **Fast Algorithms for Large Scale Network Analytics**
 - Advisor: Ümit V. Çatalyürek (now at Georgia Tech)
- **Middle East Technical University** Ankara, Turkey
B.S. in Computer Engineering, 2010

Awards

- **LDRD Research Project, Principal Investigator, 2016-2017**
‘Understanding the Hierarchy of Dense Subgraphs in Stationary and Temporally Varying Settings’
Funded under the Laboratory Directed Research and Development (LDRD) Program, \$210K/2 years
- **John von Neumann Postdoctoral Research Fellowship, 2015**
Two year fellowship in Sandia National Laboratories, supported by the Applied Mathematics program, part of the U.S. Department of Energy’s Office of Advanced Scientific Computing Research (ASCR)
- **Best Paper Runner-up, International Conference on World Wide Web (WWW) 2015**
- **Student Travel Grant for ASPLOS 2013, SDM 2013, SIGMOD 2013**

Experience

- **University at Buffalo, SUNY** Aug 2017 – Present
Assistant Professor (*Tenure track*)
Department of Computer Science and Engineering
- **Sandia National Laboratories, Livermore, CA** Sep 2015 – Aug 2017
John von Neumann Postdoctoral Fellow
- **Ohio State University, Columbus, OH** Sep 2010 – May 2015
Graduate Research Associate at HPC Lab under Ümit V. Çatalyürek
- **Sandia National Laboratories, Livermore, CA** May 2014 – Aug 2014
Intern, worked on dense subgraph discovery algorithms, resulted in [10]
Mentors: Ali Pinar and C. Seshadhri

- **IBM T. J. Watson Research Center, Yorktown Heights, NY** May 2013 – Aug 2013
Intern, worked on fault tolerance support for IBM Streams, resulted in [9]
Mentors: Gabriela Jacques-Silva and Kun-Lung Wu
- **IBM T. J. Watson Research Center, Yorktown Heights, NY** Jun 2012 – Sep 2012
Intern, worked on streaming k-core algorithms, resulted in [14]
Mentors: Gabriela Jacques-Silva and Kun-Lung Wu

Refereed Journal Papers

1. A. E. Saryüce, C. Seshadhri, A. Pinar, Ü. V. Çatalyürek
Nucleus Decompositions for Identifying Hierarchy of Dense Subgraphs
ACM Transactions on the Web (TWEB)
[DOI:10.1145/3057742](https://doi.org/10.1145/3057742)
2. A. E. Saryüce, K. Kaya, E. Saule, Ü. V. Çatalyürek
Graph Manipulations for Fast Centrality Computation
ACM Transactions on Knowledge Discovery from Data (TKDD)
[DOI:10.1145/3022668](https://doi.org/10.1145/3022668)
3. A. E. Saryüce, B. Gedik, G. Jacques-Silva, K. Wu, Ü. V. Çatalyürek
Incremental k-core Decomposition: Algorithms and Evaluation
Very Large Data Bases Journal (VLDBJ), 25(3): 425-447, 2016
[DOI:10.1007/s00778-016-0423-8](https://doi.org/10.1007/s00778-016-0423-8)
4. A. E. Saryüce, B. Gedik, G. Jacques-Silva, K. Wu, Ü. V. Çatalyürek
SONIC: Streaming Overlapping Community Detection
Data Mining and Knowledge Discovery (DAMI), 30(4): 819-847, 2016
[DOI:10.1007/s10618-015-0440-z](https://doi.org/10.1007/s10618-015-0440-z)
5. A. E. Saryüce, E. Saule, K. Kaya, Ü. V. Çatalyürek
Incremental Closeness Centrality in Distributed Memory
Parallel Computing (ParCo), 47: 3-18, 2015
[DOI:10.1016/j.parco.2015.01.003](https://doi.org/10.1016/j.parco.2015.01.003)
6. A. E. Saryüce, E. Saule, K. Kaya, Ü. V. Çatalyürek
Regularizing Graph Centrality Computations
Journal of Parallel and Distributed Computing (JPDC), 76(C): 106-119, 2015
[DOI:10.1016/j.jpdc.2014.07.006](https://doi.org/10.1016/j.jpdc.2014.07.006)

Refereed Conference and Workshop Papers

7. R. Laishram, A. E. Saryüce, Tina Eliassi-Rad, A. Pinar, S. Soundarajan
Measuring and Improving the Core Resilience of Networks
The Web Conference (WWW), 2018 (AR: 14.8%)
[DOI:\(to appear\)](https://doi.org/10.1145/3159652.3159678)
8. A. E. Saryüce, A. Pinar
Peeling Bipartite Networks for Dense Subgraph Discovery
ACM International Conference on Web Search and Data Mining (WSDM), 2018 (AR: 16.1%)
[DOI:10.1145/3159652.3159678 \(to appear\)](https://doi.org/10.1145/3159652.3159678)
9. A. E. Saryüce, A. Pinar
Fast Hierarchy Construction for Dense Subgraphs

- International Conference on Very Large Data Bases (VLDB), 2017 (AR: 17.7%)
[DOI:10.14778/3021924.3021927](https://doi.org/10.14778/3021924.3021927)
10. G. Jacques-Silva, F. Zheng, D. Debrunner, K. Wu, V. Dogaru, E. Johnson, M. Spicer, A. E. Saryüce
Consistent Regions: Guaranteed Tuple Processing in IBM Streams
International Conference on Very Large Data Bases (VLDB), Industrial Track, 2016 (AR: 33.3%)
[DOI:10.14778/3007263.3007272](https://doi.org/10.14778/3007263.3007272)
 11. A. E. Saryüce, C. Seshadhri, A. Pınar, Ü. V. Çatalyürek
Finding the Hierarchy of Dense Subgraphs using Nucleus Decompositions
International World Wide Web Conference (WWW), 2015 (AR: 14.1%) (Best Paper Runner-up)
[DOI:10.1145/2736277.2741640](https://doi.org/10.1145/2736277.2741640)
 12. A. E. Saryüce, E. Saule, K. Kaya, Ü. V. Çatalyürek
Hardware/Software Vectorization for Closeness Centrality on Multi-/Many-Core Architectures
Workshop on Multithreaded Architectures and Applications (MTAAP), in conjunction with
IEEE International Parallel & Distributed Processing Symposium (IPDPS), 2014
[DOI:10.1109/IPDPSW.2014.156](https://doi.org/10.1109/IPDPSW.2014.156)
 13. A. E. Saryüce, K. Kaya, E. Saule, Ü. V. Çatalyürek
Incremental Algorithms for Closeness Centrality
IEEE International Conference on Big Data, 2013 (AR: 37.3%)
[DOI:10.1109/BigData.2013.6691611](https://doi.org/10.1109/BigData.2013.6691611)
 14. A. E. Saryüce, E. Saule, K. Kaya, Ü. V. Çatalyürek
STREAMER: A Distributed Framework for Incremental Closeness Centrality Computation
IEEE Cluster Conference (Cluster), 2013 (AR: 31.2%)
[DOI:10.1109/CLUSTER.2013.6702680](https://doi.org/10.1109/CLUSTER.2013.6702680)
 15. A. E. Saryüce, B. Gedik, G. Jacques-Silva, K. Wu, Ü. V. Çatalyürek
Streaming Algorithms for k-core Decomposition
International Conference on Very Large Data Bases (VLDB), 2013 (AR: 22.7%)
[DOI:10.14778/2536336.2536344](https://doi.org/10.14778/2536336.2536344)
 16. A. E. Saryüce, E. Saule, K. Kaya, Ü. V. Çatalyürek
Shattering and Compressing Networks for Betweenness Centrality
SIAM International Conference on Data Mining (SDM), 2013 (AR: 25.5%)
[DOI:10.1137/1.9781611972832.76](https://doi.org/10.1137/1.9781611972832.76)
 17. A. E. Saryüce, K. Kaya, E. Saule, Ü. V. Çatalyürek
Betweenness Centrality on GPUs and Heterogeneous Architectures
Workshop on General Purpose Processing Using GPUs (GPGPU), in conjunction with
ACM International Conference on Architectural Support for Programming Languages and Operating
Systems (ASPLOS), 2013 (AR: 39.4%)
[DOI:10.1145/2458523.2458531](https://doi.org/10.1145/2458523.2458531)
 18. A. E. Saryüce, E. Saule, Ü. V. Çatalyürek
Scalable Hybrid Implementation of Graph Coloring using MPI and OpenMP
Workshop on Parallel Computing and Optimization (PCO), in conjunction with
IEEE International Parallel & Distributed Processing Symposium (IPDPS), 2012
[DOI:10.1109/IPDPSW.2012.216](https://doi.org/10.1109/IPDPSW.2012.216)
 19. A. E. Saryüce, E. Saule, Ü. V. Çatalyürek
Improving Graph Coloring on Distributed Memory Parallel Computers

Submitted Papers and Technical Reports

1. M. Y. Özkaya, A. E. Saryüce, A. Pinar, Ü. V. Çatalyürek
Active Betweenness Cardinality: Algorithms and Applications, [arXiv: 1711.10634](#)
2. S. Sanei-Mehri, A. E. Saryüce, S. Tirthapura
Butterfly Counting in Bipartite Networks,
3. A. E. Saryüce, C. Seshadhri, A. Pinar
Parallel Local Algorithms for Core, Truss, and Nucleus Decompositions, [arXiv: 1704.00386](#)
4. A. E. Saryüce, E. Saule, Ü. V. Çatalyürek
On Distributed Graph Coloring with Iterative Recoloring, [arXiv: 1407.6745](#)

Talks

1. **Invited Talk, INFORMS Annual Meeting** Oct 2017
Finding the Hierarchy of Dense Subgraphs Houston, TX
2. **Invited Talk, Complex Network Seminar, University at Buffalo** Oct 2017
Finding the Hierarchy of Dense Subgraphs using Nucleus Decompositions Buffalo, NY
3. **Graph Exploitation Symposium (GraphEx), organized by MIT Lincoln Lab** May 2017
Parallel Local Algorithms for Core, Truss, and Nucleus Decompositions (poster) Lexington, MA
4. **Invited Talk, University at Buffalo** May 2017
Parallel Local Algorithms for Core, Truss, and Nucleus Decompositions Buffalo, NY
5. **SIAM Conference on Computational Science and Engineering (SIAM CSE)** Mar 2017
Finding Dense Subgraphs with Hierarchical Relations in Real-world Networks Atlanta, GA
6. **Invited Talk, University at Buffalo** Feb 2017
Fast Algorithms for Mining and Processing Real-world Graphs Buffalo, NY
7. **LDRD Program Review Meeting, Sandia National Laboratories** Dec 2016
Understanding the Hierarchy of Dense Subgraphs Albuquerque, NM
8. **SIAM Conference on Combinatorial Scientific Computing (SIAM CSC)** Oct 2016
Fast Hierarchy Construction for Dense Subgraphs Albuquerque, NM
9. **Dean Seminar, Sandia National Laboratories** Aug 2016
Finding Dense Subgraphs and Hierarchy Construction: Models and Algorithms Livermore, CA
10. **Workshop on Algorithms for Modern Massive Data Sets (MMDS)** Jun 2016
Fast Hierarchy Construction for Dense Subgraphs (poster) Berkeley, CA
11. **Graph Exploitation Symposium (GraphEx), organized by MIT Lincoln Lab** May 2016
Fast Algorithms for Finding Dense Subgraphs with Hierarchy (poster) Lexington, MA
12. **Computer Science & Eng. Dept. Poster Exhibition at Ohio State** Feb 2015
Finding the Hierarchy of Dense Subgraphs using Nucleus Decompositions (poster) Columbus, OH
13. **Invited talk at Sandia National Laboratories** Jan 2015
Fast and High Quality Dense Subgraph Discovery Algorithms Albuquerque, NM

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| 14. Internship Exit talk at Sandia National Laboratories
Finding the Hierarchy of Dense Subgraphs using Nucleus Decompositions | Aug 2014
Livermore, CA |
| 15. Biomedical Informatics Department Retreat at Ohio State
Fast Algorithms for Large-Scale Network Analytics (poster) | Jan 2014
Columbus, OH |
| 16. IEEE Cluster Conference
STREAMER: A Distributed Framework for Incremental Closeness Cent. Comp. | Sep 2013
Indianapolis, IN |
| 17. SIAM Data Mining Conference (SDM)
Shattering and Compressing Networks for Betweenness Centrality | May 2013
Austin, TX |
| 18. Workshop on General Purpose Processing Using GPUs (GPGPU)
Betweenness Centrality on GPUs and Heterogeneous Architectures | Mar 2013
Houston, TX |
| 19. Invited talk at Bilkent University Computer Engineering Department
Streaming Algorithms for k-core Decomposition | Nov 2012
Ankara, Turkey |
| 20. Internship Exit talk at IBM T.J. Watson Researcher Center
Streaming Algorithms for k-core Decomposition | Sep 2012
Hawthorne, NY |
| 21. SIAM Conference on Parallel Processing for Scientific Computing (SIAM PP)
Considerations on Parallel Graph Coloring Algorithms | Feb 2012
Savannah, GA |

Teaching

- [CSE 610](#): Special Topics in Network Science Spring 2018
- [CSE 701](#): Large-Scale Graph Mining Fall 2017

Professional Service

Program Committee

- SIAM Data Mining Conference (SDM) , 2018
- IEEE International Parallel and Distributed Processing Symposium (IPDPS), 2018
- The Programming Models and Algorithms Workshop (PMAW) in conj. with IPDPS, 2018
- Workshop on High Performance Computing for Big Data (HPC4BD) in conj. with ICPP, 2016, 2017

Reviewer

- Journal of Parallel and Distributed Computing (JPDC)
- Parallel Computing (ParCo)
- IEEE Transactions on Parallel and Distributed Systems (TPDS)
- Journal of Machine Learning (JMLR)
- Data Mining and Knowledge Discovery (DAMI)
- IEEE Transactions on Knowledge and Data Engineering (TKDE)
- PeerJ Computer Science
- Journal of Complex Networks (COMNET)
- World Wide Web journal
- IEEE International Parallel and Distributed Processing Symposium (IPDPS)
- IEEE Cluster Conference
- IEEE International Conference On High Performance Computing (HiPC)
- International Conference on Parallel Processing (ICPP)
- Supercomputing Conference (SC)

- ACM International Conference on Management of Data (SIGMOD)
- International World Wide Web Conference (WWW)
- ACM Conference on Knowledge Discovery and Data Mining (SIGKDD)