STEPHEN RANSHOUS

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RESEARCH INTERESTS

Graph mining, data mining, machine learning, streaming analytics, outlier/anomaly detection, large scale dynamic graph analytics, hypergraph analytics, streaming graph analytics, Bitcoin

EDUCATION

North Carolina State University   Aug 2013 – present (Expected Dec 2017)
Ph.D., Computer Science   *Raleigh, NC*

- Advisor: Dr. Nagiza F. Samatova
- Coursework: Graph Data Mining, Parallel Systems, Algorithms, Operating Systems, Computational Methods in Molecular Biology, Advanced Algorithms, Advanced Topics in Machine Learning (current)
- GPA: 3.95/4.0

University of Florida   Aug 2009 – Aug 2013
B. Sci., Computer Science & Engineering   *Gainesville, Florida*

- Graduated with honors
- Earned a Minor in Electrical Engineering
- Overall GPA: 3.72/4.0
- Computer Science Major GPA: 3.97/4.0

PEER–REVIEWED PUBLICATIONS

1. M. Xu, R. Yang, **S. Ranshous**, S. Li, N. F. Samatova. "Leveraging External Knowledge for Phrase-based Topic Modeling." *Technologies and Applications of Artificial Intelligence (TAAI), 2017 (Accepted).*

2. **S. Ranshous**, M. Chaudhary, N. F. Samatova. "Efficient Outlier Detection in Hyperedge Streams Using MinHash and Locality-Sensitive Hashing." *6th International Conference on Complex Networks and their Applications, 2017 (Accepted).*

3. M. Chaudhary, **S. Ranshous**, N. F. Samatova, "A Community-driven Graph Partitioning Method for Constraint-based Causal Discovery" *6th International Conference on Complex Networks and their Applications, 2017 (Accepted).*

4. R. Yang, M. Xu, J. He, **S. Ranshous**, N. F. Samatova. "An Intelligent Weighted Fuzzy Time Series Model Based on A Sine-Cosine Adaptive Human Learning Optimization Algorithm and Its Application to Financial Markets Forecasting." *Advanced Data Mining and Applications: 13th International Conference, ADMA 2017 (Accepted).*

5. **S. Ranshous**, C. Joslyn, S. Kreyling, K. Nowak, N. F. Samatova, C. L. West, S. Winters. "Exchange Pattern Mining in the Bitcoin Transaction Directed Hypergraph." *4th Workshop on Bitcoin and Blockchain Research (BITCOIN'17), 2017.*

6. W. Zhang, H. Tang, **S. Ranshous**, S. Byna, D. Martin, K. Wu, B. Dong, S. Klasky, and N. F. Samatova. "Exploring Memory Hierarchy and Network Topology for Runtime AMR Data Sharing Across Scientific Applications." *IEEE BigData, 2016.*

7. M. Kheirkhahan, C. Tudor-Locke, R. Axtell, M. P. Buman, R. A. Fielding, N. W. Glynn, J. M. Guralnik, A. C. King, D. K. White, M. E. Miller, J. Siddique, P. Brubaker, W. J. Rejeski, **S. Ranshous**, M. Pahor, S. Ranka, T. M. Manini. "Actigraphy features for predicting mobility disability in older adults." *Physiological Measurement* 37.10 (2016): 1813.

8. **S. Ranshous**, S. Harenberg, K. Sharma, N. F. Samatova, "A Scalable Approach for Outlier Detection in Edge Streams Using Sketch-based Approximations." *In SIAM International Conference on Data Mining (SDM), 2016.*

9. **S. Ranshous**, S. Shen, D. Koutra, S. Harenberg, C. Faloutsos, N. F. Samatova, "Anomaly Detection in Dynamic Networks: A Survey." *WIREs Comp. Stat., 2015.*

10. S. Harenberg, R. G. Seay, **S. Ranshous**, K. Padmanabhan, J. K. Harlalka, E. R. Schendel, R. Y. Chirkova, W. Hendrix, A. N. Choudhary, V. Kumar, and N. F. Samatova. "Memory-efficient query-driven community detection: application to complex disease associations." *In SIAM International Conference on Data Mining (SDM), 2014.*

11. H. Tang, X. Zou, J. Jenkins, D. A. Boyuka II, **S. Ranshous**, D. Kimpe, S. Klasky, and N. F. Samatova. "Improving Read Performance with Online Access Pattern Analysis and Prefetching." *Euro-Par 2014 Parallel and Distributed Data Management.*

12. X. Zou, S. Lakshminarasimhan, D. A. Boyuka II, **S. Ranshous**, H. Tang, S. Klasky, and N. F. Samatova. "Fast Set Intersection through Run-time Bitmap construction over PForDelta-compressed Indexes." *Euro-Par 2014 High Performance and Scientific Applications.*

13. S. Harenberg, G. A. Bello, L. Gjeltema, **S. Ranshous**, J. Harlalka, R. Seay, K. Padmanabhan, and N. Samatova. "Community detection in large-scale networks: A survey and empirical evaluation." *WIREs Comp. Stat., 2014.*

POSTERS

1. C. Joslyn, C. Dowling, S. Kreyling, **S. Ranshous**, C. West, A. White, "Transaction Hypergraph Models for Pattern Identification in the Bitcoin Blockchain." *International Conference on Financial Cryptography and Data Security, 2016.*

2. C. Joslyn, B. Praggastis, E. Purvine, A. Sathanur, M. Robinson, **S. Ranshous**. "Local Homology Dimension as a Network Science Measure." *SIAM Workshop on Network Science, 2016.*

AWARDS AND HONORS

- Travel award recipient to SIAM Data Mining 2016 (SDM16) Conference
- 1st place Spring 2013 and Fall 2014 NCSU Programming Competition
- NCSU College of Engineering Graduate Merit Award
- Deans list 2010-2013 University of Florida

SERVICE

- ACM International Collegiate Programming Contest (ICPC) 2016 Regional Site Judge
- Reviewer for:
  - Concurrency and Computation: Practice and Experience
  - High-Performance Parallel and Distributed Computing

- International Symposium on Big Data Computing

- International Conference on Parallel and Distributed Systems

- International Journal of Information Technology & Decision Making

TECHNICAL STRENGTHS

Languages	Python, Java, C, C++, MATLAB, Bash, R, SQL
Tools & Frameworks	Scipy/Numpy, scikit-learn, tensorflow, Git, LaTeX, MySQL, MongoDB
Parallel Programming	MPI, OpenMP, CUDA, Hadoop, OpenACC
Operating Systems	Linux (Ubuntu and RedHat), Windows

WORK EXPERIENCE

North Carolina State University   Aug 2013 – Present
Research Assistant   *Raleigh, NC*

- Researching and solving problems related to (i) anomaly detection and attribution in large scale, dynamic multigraphs; (ii) efficient query driven analysis for community detection; (iii) mining the Bitcoin transaction graph. [C, C++, Python, R]

Pacific Northwest National Lab   Oct 2015 – Apr 2016
Research Assistant   *Seattle, WA*

- (i) Designed and developed a framework for mining the Bitcoin transaction graph. The framework started with raw Bitcoin data and enabled the user to develop relational queries using SQL, or graph mining algorithms using our directed hypergraph model. (ii) Designed and implemented a solution for classifying latent attributes and finding discrimating language patterns of multilingual Twitter users. [C, Python, SQL, Java, MongoDB]

Argonne National Lab   May 2014 – Aug 2014
Research Assistant   *Lemont, IL*

- Analyzed spatiotemporal climate datasets in collaboration with domain scientists using graph data mining based approaches. Created a system for automated identification of regions of the world that show persistent similar behavior, or anomalous dissimilarity. [MATLAB, Python]

University of Florida   Jan 2013 – Aug 2013
Research Assistant   *Gainesville, FL*

- Created a classification pipeline that would process raw tri-axial accelerometer data and label participants as mobility impaired or unimpaired, with ground truth knowledge using Short Physical Performance Battery (SPPB) tests. [MATLAB, Python]

University of Florida – CISE Department   Aug 2012 – May 2013
Computer Science Tutor   *Gainesville, FL*

- Held 13 office hours every week where students came in for help with any undergraduate computer science course. Worked with the students to help them articulate the problem and guide them to a solution while encouraging critical thinking and problem solving. [C, C++, Java]

REFERENCES

Available on request.