

Alan Kuhnle

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RESEARCH INTERESTS Scalable approximation algorithms; dynamic and uncertain networks; succinct data structures; genome assembly and genomic databases; social networks; non-submodular and non-convex optimization

CURRENT POSITION *Postdoctoral Fellow*, Informatics Institute
University of Florida, Gainesville, FL
May 2018 – Present

EDUCATION *Doctor of Philosophy*, Computer Science
University of Florida, Gainesville, FL, received May 2018.
Dissertation title: “Scalable Algorithms for Vulnerability Assessment of Large-Scale Networked Systems”

Master of Science, Mathematics
University of Florida, Gainesville, FL, received May 2013.

Bachelor of Science, Mathematics
Florida State University, Tallahassee, FL, received May 2010.
Summa cum Laude

- AWARDS**
- UF Informatics Institute Postdoctoral Fellowship Award (\$25000)
 - Best Runner-Up Paper Award, ASONAM 2018
 - Invited to Best Papers of ICDM special issue (2017)
 - NSF Travel Grant Awards: INFOCOM 2017 (\$1000), SIGMETRICS 2018 (\$1000)
 - Best Paper Award, 10th International Conference on Mobile Ad-hoc and Sensor Networks (2014)

 - University of Florida Graduate Fellowship (2013 – 2017)
 - Barry M. Goldwater Scholarship (\$7500, 2009)
 - Florida Senate Spirit of Service Award (2009)
 - FSU Undergraduate Research Award (\$4000, 2009)

PUBLICATIONS Unless indicated otherwise, ordering of authors is by descending contribution.

Peer-Reviewed Conference Publications

17. Alan Kuhnle*, Taher Mun*, Christina Boucher, Travis Gagie, Ben Langmead, Giovanni Manzini. Efficient Construction of a Complete Index for Pan-Genomics Read Alignment. *International Conference on Research in Computational Molecular Biology (RECOMB)*, 2019. * *First two authors ordered alphabetically; followed by the last four ordered alphabetically*

16. Huiling Zhang, Alan Kuhnle, J. David Smith, My T. Thai. Restraining Misinformation and Pushing out the Truth. *International Conference on Advances in Social Networks Analysis and Mining (ASONAM)*, IEEE/ACM 2018. **(Best Runner-Up Paper Award)**
15. Bahar Alipanahi, Alan Kuhnle, Christina Boucher. Recoloring the Colored de Bruijn Graph. *Symposium on String Processing and Information Retrieval (SPIRE)*, 2018.
14. Alan Kuhnle, Victoria G. Crawford, My T. Thai. Network Resilience and the Length-Bounded Multicut Problem: Reaching the Dynamic Billion-Scale with Guarantees. *International Conference on Measurement and Modeling of Computer Systems (SIGMETRICS)*, ACM 2018. *Extended abstract, full version published in POMACS journal*
13. Christina Boucher, Travis Gagie, Alan Kuhnle, Giovanni Manzini. Prefix-Free Parsing for Building Big BWTs. *Workshop on Algorithms in Bioinformatics (WABI)*, 2018. *Authors listed alphabetically.*
12. Alan Kuhnle, J. David Smith, Victoria G. Crawford, My T. Thai. Fast Maximization of Non-Submodular, Monotonic Functions on the Integer Lattice. *International Conference on Machine Learning (ICML)*, 2018.
11. Tianyi Pan, Alan Kuhnle, Xiang Li, My T. Thai. Vulnerability of Interdependent Networks with Heterogeneous Cascade Models and Timescales. *International Conference on Distributed Computing Systems (ICDCS)*, IEEE 2018.
10. J. David Smith, Alan Kuhnle, My T. Thai. An Approximately Optimal Bot for Non-Submodular Social Reconnaissance. *Conference on Hypertext and Social Media (HT)*, ACM 2018.
9. Alan Kuhnle, Victoria G. Crawford, My T. Thai. Scalable and Adaptive Algorithms for the Triangle Interdiction Problem on Billion-Scale Networks. *International Conference on Data Mining (ICDM)*, IEEE 2017. **(Invited to KAIS Journal Special Issue: ICDM Best Papers)**
8. Tianyi Pan, Alan Kuhnle, Xiang Li, My T. Thai. Dynamic Propagation Rates: New Dimension to Viral Marketing in Online Social Networks. *International Conference on Data Mining (ICDM)*, IEEE 2017.
7. Alan Kuhnle, Tianyi Pan, Victoria G. Crawford, Md A. Alim, My T. Thai. Pseudo-Separation for Assessment of Structural Vulnerability of a Network. *International Conference on Measurement and Modeling of Computer Systems (SIGMETRICS)*, ACM 2017.
6. Alan Kuhnle, Tianyi Pan, Md A. Alim, My T. Thai. Scalable Bicriteria Algorithms for the Threshold Activation Problem in Online Social Networks. *International Conference on Computer Communications (INFOCOM)*, IEEE 2017.
5. Huiling Zhang, Alan Kuhnle, Huiyuan Zhang, My T. Thai. Detecting Misinformation in Online Social Networks Before It Is Too Late. *International Conference on Advances in Social Networks Analysis and Mining (ASONAM)*, IEEE 2016.
4. Huiyuan Zhang, Huiling Zhang, Alan Kuhnle, My T. Thai. Profit Maximization for Multiple Products in Online Social Networks. *International Conference on Computer Communications (INFOCOM)*, IEEE 2016.
3. Subhankar Mishra, Xiang Li, Alan Kuhnle, My T. Thai, Jungtaek Seo. Rate Alteration Attacks in Smart Grid. *International Conference on Computer Communications (INFOCOM)*, IEEE 2015.

2. Alan Kuhnle, Xiang Li, My T. Thai. Online Algorithms for Optimal Resource Management in Dynamic D2D Communications. *International Conference on Mobile Ad-hoc and Sensor Networks (MSN)*, IEEE 2014. (**Best Paper Award**)
1. Md A. Alim, Alan Kuhnle, My T. Thai. Are communities as strong as we think?. *International Conference on Advances in Social Networks Analysis and Mining (ASONAM)*, IEEE 2014.

Journal Articles

7. Alan Kuhnle, Victoria G. Crawford, My T. Thai. Scalable Approximations to k-Cycle Transversal Problems on Dynamic Networks. *Knowledge and Information Systems (KAIS)*, Springer 2019. (to appear)
6. Victoria Crawford*, Alan Kuhnle*, Christina Boucher, Rayan Chikhi, Travis Gagie. Practical Dynamic de Bruijn Graphs. *Bioinformatics*, Oxford University Press 2018. *These authors contributed equally to this work and are ordered alphabetically.
5. Alan Kuhnle, Md A. Alim, Xiang Li, Huiling Zhang, My T. Thai. Multiplex Influence Maximization in Online Social Networks with Heterogeneous Diffusion Models. *Transactions on Computational Social Systems*, IEEE 2018.
4. Alan Kuhnle, Victoria G. Crawford, My T. Thai. Network Resilience and the Length-Bounded Multicut Problem: Reaching the Dynamic Billion-Scale with Guarantees. *Journal Proc. ACM Meas. Anal. Comput. Syst. (POMACS)*, ACM 2018. An extended abstract of this work was presented at *ACM SIGMETRICS 2018*.
3. Alan Kuhnle, Xiang Li, J. David Smith, My T. Thai. Online set multicover algorithms for dynamic D2D communications. *Journal of Combinatorial Optimization*, Springer 2017.
2. Alan Kuhnle, Nam P. Nguyen, Thang N. Dinh, My T. Thai. Vulnerability of clustering under node failure in complex networks. *Social Network Analysis and Mining*, Springer 2017.
1. Subhankar Mishra, Xiang Li, Tianyi Pan, Alan Kuhnle, My T. Thai. Price Modification Attack and Protection Scheme in Smart Grid. *Transactions on Smart Grid*, IEEE 2015.

TEACHING EXPERIENCE

Lecturer, University of Florida
 Calculus for Business, Summer 2012
 Designed and taught course

Guest Lecturer, University of Florida
 Introduction to Bioinformatics, Fall 2018
 Duties: Taught lectures, designed assignments
 Course webpage: <http://www.christinaboucher.com/teaching/4930/index.php>

Guest Lecturer, University of Florida
 Approximation Algorithms, Fall 2017
 Duties: Taught lectures, designed assignments

Course webpage: <http://optnetsci.cise.ufl.edu/class/cot5442fa17/>

Teaching Assistant, University of Florida

Courses (sections): Software Engineering (6), Pre-Calculus (3), Calculus I (9), Calculus II (6)

Duties: Weekly discussion sections, office hours

PROFESSIONAL SERVICE *Program Committee member*: TheWebConf (WWW) 2019

Publicity Chair: Critical Infrastructure Network Security (CINS) 2017, International Workshop on String Algorithms in Bioinformatics (StringBio) 2018

Reviewer: IEEE Transactions on Networking, IEEE Transactions on Knowledge and Data Engineering, ACM SIGMETRICS, IEEE INFOCOM, Journal of Combinatorial Optimization, Online Social Networks and Media, International Symposium on String Processing and Information (SPIRE)