Jace D. Robinson Curriculum Vitae

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Personal Statement

I am a graduate researcher fascinated with the notion of mapping mathematical and statistical ideas to real data with impact. Through several theoretical and applied research experiences, I have explored a range of topics from mathematical and probabilistic modeling, algorithmic development, pure mathematics, high performance programming, and software engineering. These experiences have cemented my desire to pursue a career researching problems at the intersection of data and mathematics. I will be pursuing a PhD in network science and machine learning following graduation.

Education

Wright State University Dayton, OH, USA
M.S. in Computer Science (GPA: 4.0) (Expected) April 2018
Advisor: Dr. Derek Doran
Thesis: "Seasonal Dynamic Stochastic Block Model" (in progress)
Focus: network science and machine learning
Highlighted Courses: network science, machine learning, information theory, algorithms design and analysis
B.S. in Mathematics with University Honors and summa cum laide (GPA: 3.98) May 2016
B.S. in Computer Science with University Honors and summa cum laide May 2016
Advisor: Dr. K.T. Arasu
Thesis: "Investigation of Algebraic Combinatorics through Difference Sets"
Focus: computational mathematics, combinatorics, applied mathematics
Highlighted Courses: intro machine learning, optimization techniques, computational data analysis, combinatorics and graph theory, intro to software engineering

Research Experience

Wright State University, Dayton, OH, USA
Graduate Research Assistant, Kno.e.sis Research Center August 2016-Present
Advisor: Dr. Derek Doran

- Creating a new dynamic network model using stochastic block model with seasonal time dependencies for anomaly detection in massive geospaces
- Applying my network model on datasets of Enron email network, New York City taxi dataset, and synthetic networks (R)
- Acquired knowledge of random network models, kalman filters, state space model, time series, bayesian statistics, artificial neural networks, general linear models, markov models, expectation-maximization, nonlinear optimization and markov chain monte carlo

- Assisted advisor in writing grant proposal based on thesis project for Bloomberg Data Science Grant
- Reviewer for two journal and two conference submissions

Undergraduate Research Assistant, Department of Mathematics and Statistics 2014-2015
Advisor: Dr. K.T. Arasu

- Created combinatorial arguments and computational software to discover new *almost difference sets* and *almost difference families* (Java)
- Assisted advisor in refereeing two potential journal publications

NASA Glenn Research Center, Cleveland, OH, USA
LERCIP Summer Intern June 2017-August 2017
Advisors: Debra Goodenow and Dr. Jerry Myers

- Used probabilistic risk assessment techniques to model how much risk astronauts face from medical conditions under different mission parameters
- Developed a tool which ran monte carlo simulations of mission scenarios, where diseases could occur at random across time following poisson, binomial and bayesian networks distributions (MATLAB)
- Followed agile programming environment with daily updates in slack and weekly in person code presentations

Air Force Institute of Technology, Wright Patterson Air Force Base, USA
Federal Contractor, Southwestern Ohio Council for Higher Education May 2016-May 2017
Federal Contractor, Oak Ridge Institute for Science and Education April 2015-April 2016
Advisor: Dr. Andrew Terzuoli

- Developed original parallel iterative closest point algorithm using k-d trees and Delaunay triangulation on GPU to align two point clouds in real-time (C, C++, CUDA)
- Algorithmic improvements to Gauss-Newton nonlinear optimization algorithm applied on noisy line-of-sight sensor measurements (MATLAB)
- Modeled web traffic using mixture model of Markov Chains (MATLAB)
- Additional contributions to projects of designing website to store and share 3d models, simulating radiation patterns of antennas in CST and SATCOM software, and modeling atmospheric effects on high frequency communication signals
- Communicated in interdisciplinary environment of physicists, mathematicians, electrical engineers, and computer scientists at undergraduate and graduate level
- Presented monthly technical presentations to project sponsors
- Mentored undergraduate students by creating and leading subprojects

Publications

Preprints or Under Review

1. **Robinson J.**, Myers J., Goodenow D., McIntyre L., Bhattacharyya K., Bellisario B., Leinweber L., Gilkey K., "Introduction to the Medical Extensible Dynamic Probabilistic Risk Assessment Tool", NASA Human Research Program Investigators Workshop, Jan 2018.

Peer Reviewed

2. **Robinson J.**, Doran D., "Seasonality in Dynamic Stochastic Block Models", Proceedings of the International Conference on Web Intelligence, ACM, 2017.
3. **Robinson J.**, Piekenbrock M., Burchett L., Nykl S., Woolley B., Terzuoli A., "Parallelized Iterative Closest Point for Autonomous Aerial Refueling", Proceedings of Advances in Visual Computing (Lecture Notes in Computer Science 10072), 2016.
4. Burchett L., **Robinson J.**, Piekenbrock M., Nykl S., Woolley B., and Terzuoli T., "Automated aerial refueling: Parallelized 3d iterative closest point", Proceedings in IEEE (International). Conference in Aerospace & Electronics, 2016.
5. Levy D., Roos J., **Robinson J.**, Carpenter W., Martin R., Taylor, C., Sugrue J., Terzuoli A., "Non Linear Optimization Applied to Angle-Of-Arrival Satellite Based Geo-Localization for Biased and Time-Drifting Sensors", In International Archives of the Photogrammetry, Remote Sensing & Spatial Information Sciences 41, 2016.
6. **Robinson J.**, Arasu K., "Investigation of Algebraic Combinatorics through Difference Sets", Undergraduate Thesis, Wright State University, 2016.
7. Phillips B., **Robinson J.**, "Some New Almost Difference Sets Via Finite Fields", ACM Communications in Computer Algebra 49, 2015.

Invited Presentations

1. "Generative Dynamic Network Modeling", Wright State, Data Science and Security Cluster, Dec 2017.
2. "Seasonal Dynamic Stochastic Block Model", Wright State, Graduate Research Symposium, April 2017.
3. "Some New Almost Difference Sets Via Finite Fields", Wright State, Celebration of Research, 2015.
4. "New Almost Difference Families via Cyclotomy and Block Designs", Miami University, Pi Mu Epsilon Student Conference, 2015.
5. "Some New Almost Difference Sets Via Finite Fields", University of Dayton, Undergraduate Mathematics Day, 2015.
6. "Some New Almost Difference Sets Via Finite Fields", Fordham University, Applied Computer Algebra Conference, 2014.

Teaching Experience

Wright State University, Dayton, OH, USA
Recitation Instructor, Department of Computer Science and Engineering 2013-2014
Courses: Discrete Mathematics, Discrete Structures, Intro to Discrete Structures

- Designed 55 minute reviews of the main lecture to present in recitation along with providing feedback on homework and exams

Undergraduate Teaching Assistant, Department of Mathematics and Statistics 2013
Courses: Calculus I-II, College Algebra

- Led lab over Mathematica, answered student questions one-on-one, and provided feedback on homework and exams

Honors and Awards

1. Summa cum laide for B.S. in Mathematics and B.S. in Computer Science 2016
2. University Honors for B.S. in Mathematics and B.S. in Computer Science 2016
3. CECS Senior Design Showcase Nominee 2016
4. Certificate of Achievement 2016
5. Dean's List (all semesters) 2012-2016
6. Dean's Circle Invitation 2013
7. Greeneview High School Valedictorian 2012

Scholarships

8. Barry Goldwater Scholarship Nominee 2015
9. Reynolds & Reynolds Scholarship $5,000 2014
10. Krishan K Gorowara Memorial Scholarship $1,000 2014
11. Science and Mathematics Scholarship $500 2014
12. Valedictorian/Salutatorian Scholarship (Full In-State Tuition) $32,000 2012
13. Honors Competitive Scholarship $10,000 2012

Highlight of Class Projects

1. Explored the differences in dissemination of fake versus factual news on Twitter using a dynamic stochastic block model and machine learning classifier with labels web crawled from fact checking website *snopes.com* (R)
2. Detected and presented significant differences in features between public and private universities through classification problem on U.S. College Scorecard dataset using Bayesian logistic regression (R)
3. Developed software to data mine Twitter, identify dangerous incidents by natural language processing, cluster using geolocations, and visualize results (Java, R)
4. Data mined Twitter and created visualizations of popular political candidates and news stories surrounding the 2016 presidential primary election (Python, Tableau, HTML)

Technology Proficiencies

R	MATLAB	C++	C
CUDA	Java	Python	HTML

Tableau

Leadership and Service Activities

Chair of College of Science and Mathematics Dean's Circle 2013-2015
Advisors: Assistant Dean Jacqueline Neal and Dean Yi Li

- Led a group of 14 students representing the 8 departments of the college
- Regularly spoke to crowds of prospective Wright State students and families at open house events
- Promoted involvement in scientific community through fun science seminars of *Fun with Fire and Explosions* and *The Science of Beer*
- Assisted faculty by organizing informational seminar on new *Undergraduate Research & Experiential Learning* program

Volunteer at Wright State Friendship Food Pantry 2012-2013
Advisor: Felix E. Torres

- Aided in providing emergency food and referrals to students in times of need, helping them to stay in school and meet their educational goals.

Other

U.S. Citizen