Bernadette K. Bucher

408 S Croskey St Unit C, Philadelphia, PA 19146
bucherb@seas.upenn.edu
http://bernadettekbucher.com

Education

University of Pennsylvania *August 2018 - present*
Ph.D. Computer Science, Advisor: Dr. Kostas Daniilidis
Fully funded through department and advisor

Georgia Institute of Technology *August 2016 - August 2018*
15 graduate credits, School of Computer Science
Fully funded by Lockheed Martin Corporation

The University of Alabama
M.A. Economics *January 2012 - May 2014*
M.A. Mathematics, Advisor: Dr. Kabe Moen *August 2012 - May 2014*
B.S. Mathematics and Economics, Advisor: Dr. Kabe Moen *August 2010 - May 2014*
Fully funded through academic scholarships

Publications

Bernadette Bucher*, Siddharth Singh*, Clélia de Mutalier, Kostas Daniilidis, Vijay Balasubramanian. *Curiosity Increases Equality in Competitive Resource Allocation.* ICLR Workshop on Bridging AI and Cognitive Science, 2020.

Bernadette Bucher*, Karl Schmeckpeper*, Nikolai Matni, Kostas Daniilidis. *Action for Better Prediction.* arXiv Preprint, 2020.

Sudeep Dasari, Frederik Ebert, Stephen Tian, Suraj Nair, **Bernadette Bucher**, Karl Schmeckpeper, Siddharth Singh, Sergey Levine, Chelsea Finn. *RoboNet: Large-Scale Multi-Robot Learning.* CoRL, 2019.

Bernadette Bucher, Anton Arapin, Ramanan Sekar, Feifei Duan, Marc Badger, Kostas Daniilidis, Oleh Rybkin. *Perception-Driven Curiosity with Bayesian Surprise.* RSS Workshop on Combining Learning and Reasoning Towards Human-Level Robot Intelligence, 2019.

Kenneth Chaney*, **Bernadette Bucher***, Evangelos Chatzipantazis, Jianbo Shi, Kostas Daniilidis. *Unsupervised Monocular Depth and Latent Structure.* CVPR Workshop on 3D Scene Understanding for Vision, Graphics, and Robotics, 2019.

Bernadette Bucher. Mathematically Modeling the Spread of Methamphetamine Use. Masters Thesis. The University of Alabama Libraries Digital Collections, 2014. 1561337.

Selected Research Experience

Doctoral Research (August 2018 - Present)
Dr. Kostas Daniilidis, GRASP Lab, Department of Computer Science, University of Pennsylvania

- Developing meaningful representations of sensory data in robotic systems for autonomous decision making with a focus on neuromorphic approaches to perceptual decision making.
- Collaborating directly with multiple departments outside of engineering within University of Pennsylvania as well as with other universities and industry partners.

Masters and REU Research (May 2013 - May 2014)
Dr. Alun Lloyd, Department of Statistics, North Carolina State University &
Dr. Kabe Moen, Department of Mathematics, The University of Alabama

- NSF and NSA funded research to model the spread and dynamics of methamphetamine use throughout populations. Continued and extended research for Masters thesis.

REU Research (June 2012 – July 2012)
Dr. Francine Blanchet-Sadri, Department of Computer Science
University of North Carolina at Greensboro

- NSF funded research to develop theoretical framework for studying the complexity behavior of infinite abelian partial words. Simulated theoretical results in Python.

Industry Experience

Senior Software Engineer (September 2016 - August 2019, King of Prussia, PA)
Warfighter Solutions
Rotary and Mission Systems, Lockheed Martin Corporation

- Engineering team author for $200+ million winning government proposal.
- Architecture team lead for internal research effort of 2 to 12 people. Executed demos for customer engagements. Transitioned technology to affiliated business capture efforts.
- Author and demo presenter for multiple RFI responses to various government customers.
- Designed and developed suite of configurable digital signal processing algorithms for real-time software defined radio platforms in C++ and CUDA.
- Supported integration of algorithm software suite for different applications and waveforms across multiple programs including government contracts and internal research efforts.
- Led and supported multiple physical layer development and RF integration processes from algorithm simulation through hardware integration.
- Agile Scrum Master for software and systems engineering team for phases of a program.
- Interviewed 50+ engineering candidates to support division staffing.

Software Engineer (January 2015 - September 2016, Gaithersburg, MD & King of Prussia, PA)
GEOINT Visualization Services
Space Systems Company, Lockheed Martin Corporation

- Designed, developed, and maintained full stack web-based mapping software.
- POC for users developing with our API to build plugins for our applications.
- Led 3 to 8 person software engineering team in planning complete sprints, ran daily scrum meetings, and wrote new stories during periods as an Agile Scrum Master.
- Hosted Customer Program Manager on all PA location site visits.

Systems Integration and Test Engineer (September 2014 - January 2015, Gaithersburg, MD)
Integrated Exploitation Capabilities
Information Systems and Global Solutions, Lockheed Martin Corporation

- Evaluated image processing algorithms for technology assessment of existing software.
- Developed and maintained C++ and Java based software products on an Agile team.
- Led refactoring effort to bring software up to new security standards.

Selected Presentations

Improving Predictive Models with Curiosity. Invited speaker. University of Pennsylvania, GRASP Student Seminar Series, April 2020.

Perception-Driven Representations for Autonomous Robotics. Invited speaker. Massachusetts Institute of Technology, CSAIL, Robotics Seminar, November 2019.

Geometric Deep Learning. Invited speaker. University of Alabama, Department of Mathematics, Applied Mathematics Seminar, April 2019.

Error Correcting Codes. Invited speaker. Lockheed Martin Corporation, Rotary and Mission Systems, Warfighter Solutions Lunch and Learn Series, September 2017.

Digital Demodulation. Invited speaker. Lockheed Martin Corporation, Rotary and Mission Systems, Warfighter Solutions Lunch and Learn Series, March 2017.

Mathematics Careers in Digital Signals Processing. Invited speaker. Villanova University, Department of Mathematics, Association of Women in Mathematics, February 2017.

Modeling Illicit Drug Use: How Does Methamphetamine Use Spread Through Urban and Rural Populations? Poster presentation. Joint Mathematics Meetings, January 2014.

The Navier-Stokes Equations: A Survey of Progress and Problems. Invited speaker. University of Alabama, Department of Mathematics, Mathematics Seminar, November 2013.

Infectious Disease Modeling and the Spread of Methamphetamine Use. Invited speaker. University of Alabama, Department of Mathematics, Pi Mu Epsilon, October 2013.

Selected Honors and Awards

Haidas and Chryssikou Fellowship Recipient	*2020*
NSF Travel Grant Award for RSS Conference Presentation	*2019*
Rising Stars Executive Mentoring Program, Lockheed Martin Corporation	*2018-2019*
Special Recognition Award, Lockheed Martin Corporation	*2017*
New Business Capture Award, Lockheed Martin Corporation	*2017*
2 Spot Awards, Lockheed Martin Corporation	*2016-2017*
10+ Peer Awards, Lockheed Martin Corporation	*2015-2018*
Outstanding Presenter Award, Joint Mathematics Meetings	*2014*
Vice President, Pi Mu Epsilon, National Mathematics Honorary Society	*2013-2014*
Double Major with Distinction Award	*2014*
Faculty Excellence Award in Economics	*2013*
Analytic Excellence in Business Award	*2013*
Special Achievement Award in Economics	*2012*

University of Alabama Presidential Scholarship *2010-2014*
University of Alabama Engineering Scholarship *2010-2012*

Selected Teaching and Outreach

Head Teaching Assistant *January 2020 - May 2020*
Automata, Computability and Complexity (CIS 262)
Dr. Jean Gallier, University of Pensylvania

Team Mentor, George Washington Carver High School *August 2019 - February 2020*
FIRST Tech Challenge

Teaching Assistant *August 2019 - December 2019*
Advanced Topics in Machine Perception (CIS 680)
Dr. Jianbo Shi, University of Pensylvania

Mentor, Research and Engineering Apprenticeship Program *June 2019 - August 2019*
Army Engineering Outreach Program

Volunteer Robot Design Judge *February 2019*
FIRST LEGO League

Volunteer Teacher *December 2014*
Cool Careers in Cybersecurity for Girls Workshop

Lab Instructor, Mathematics Technology Learning Center *January 2013 - May 2014*
The University of Alabama