WILLIAM N. HERLANDS

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EDUCATION

Carnegie Mellon University, Pennsylvania (2014-Present)
- PhD Student in Machine Learning and Public Policy; GPA: 4.02
- Funded in part by NSF Graduate Fellowship and ARCS Fellowship
- Advised by Dr. Daniel Neill and Dr. Andrew Gordon Wilson
- Coursework includes: Advanced statistical machine learning, statistics theory, microeconomics, probabilistic graphical models, convex optimization, computational causation, and political philosophy.

Princeton University, New Jersey (2008-2012)
- BSE in Electrical Engineering; GPA: 3.79
- Concentration in Machine Learning
- Minors in Computer Science and Near Eastern Studies

EMPLOYMENT

Boston Citywide Analytics Team, Massachusetts (2016) *Summer Fellow*
- Worked in Dept. of Innovation and Technology to bring cutting edge analytics technologies to city govt.
- Developed a natural language processing tool to provide actionable insight into tens of thousands of resident permit applications and internally generated documents that until then had been ignored.

Baron Public Affairs, Washington DC (2015-2017) *Consultant*
- Consulted on statistical methodology and big data technologies for this elite political consulting firm
- Developed massive network-based machine learning system for influence mapping in heterogeneous data

MIT Lincoln Laboratory, Massachusetts (2012-2014) *Assistant Researcher*
- Conducted research on artificial intelligence, robotics, and cybersecurity. See research below.
- Initiated and managed project on robotic swarm cybersystems, collaborating with MIT researchers
- Guided Department of Defense officials on implications of our research for national defense

Adaptive Motion Technologies, Maryland (2012) *Engineer*
- Designed and constructed a low-cost, highly adaptable prosthetic leg for amputees in the developing world
- Presented design to Walter Reed Army Institute of Medicine

Diana Furchtgott-Roth, New York (2012) *Intern*
- Conducted general macroeconomics research for former chief economist of the Department of Labor and Senior Fellow at the Manhattan Institute
- Wrote reports on the economic implications of 2012 Presidential candidates' energy policies

AWARDS
- Suresh Konda Award for the best 1st paper at in public policy, Carnegie Mellon University (2016)
- National Science Foundation Graduate Research Fellowship (3 year tuition and stipend award, 2014)
- ARCS Foundation Fellowship (3 year stipend award, 2014)
- *Phi Beta Kappa*, liberal arts and sciences honor society (inducted June 2012)
- *Tau Beta Pi*, engineering honor society (inducted December 2010)
- *Sigma Xi*, scientific research honor society (inducted June 2012)
- Calvin Dodd MacCracken Senior Thesis Award, Princeton University (June 2012)
- Charles Ira Young Memorial Tablet and Medal (June 2012)
- Excellence in Engineering Funding (May 2011)
- Kamran Rafieyan '89 Fund for Undergraduate Research (October 2011 and October 2010)

PUBLICATIONS
- "Change Surfaces for Expressive Multidimensional Changepoints and Counterfactual Prediction", **Herlands**, Nickisch, Neill, Wilson. *Working paper.*

- "Bivariate Kernel Space-Time Test for Leading Indicator Selection", **Herlands**, Neill. *Working paper.*

• "Scalable Gaussian Processes for Characterizing Multidimensional Change Surfaces", **Herlands**, Wilson, Nickisch, Flaxman, Neill, van Panhuis, Xing. *Artificial Intelligence and Statistics* (AISTATS), 2016.

• "Lass0: Sparse Non-Convex Regression by Local Search", **Herlands**, De-Arteaga, Neill, Dubrawski. *NIPS Workshop on Optimization*, 2015.

• "A Machine Learning Approach to Musically Meaningful Homogeneous Style Classification", **Herlands**, Der, Greenberg, Levin. *Association for the Advancement in Artificial Intelligence* (AAAI), 2014.

• "Effective Entropy: Security-Centric Metric for Memory Randomization Technologies", **Herlands**, Hobson, and Donovan. *USENIX Workshop on Cybersecurity Security Experimentation*, 2014.

TALKS

• "Generalized Difference-in-Difference Models with Gaussian Processes", *Joint Statistical Meetings*, 2016.

• "Scalable Gaussian Processes for Characterizing Multidimensional Change Surfaces", **Herlands**, Wilson, Nickisch, Flaxman, Neill, van Panhuis, Xing. *John Heinz III College at Carnegie Mellon University*, 2016.

• "Small Area Spatiotemporal Crime Rate Forecasting", *The American Society of Criminology*, 2015.

TEACHING

Machine Learning 10-601, Carnegie Mellon (2016) *Teaching Assistant*
• Designed problem sets and tests. Taught recitations and held weekly office hours for this Masters level course in machine learning methodology and practice.

System Design and Analysis ELE301, Princeton (2012) *Teaching Assistant*
• Mentored and supervised Junior Electrical Engineering students as they developed small-scale autonomous vehicles

PROFESSIONAL SERVICE

• Organizing 2016 NIPS Workshop on Interpretable Machine Learning for Complex Systems

RESEARCH EXPERIENCE

Crime Prediction for Safer Cities, Carnegie Mellon University (2016 - Present) *Researcher*
• Developing high precision spatio-temporal forecasts of violent crime on a week-by-week basis in Pittsburgh. Predictions through integrating innovative deep learning architectures, Hawkes processes, and Gaussian processes
• Working with Pittsburgh police to integrate predictions into weekly deployment procedures for patrol cars beats

Event Pattern Detection Laboratory, Carnegie Mellon University (2014 - Present) *Researcher*
• Investigating novel methods for causal inference at the intersection of machine learning and econometrics
• Evaluating policy interventions without randomized control trials. Developing Bayesian nonparametric algorithms to predict counterfactual measures in highly complex, massive, multidimensional data

Transportation Experimentation and Prediction, City of Boston (2014-2015)
• Worked with Department of Transportation to develop randomized experiments and evaluation techniques to reduce traffic through real time predictive analytics and scheduling of public transportation

Human Trafficking Advertisement Modeling, Carnegie Mellon University (2014)
• Analyzed 10,000s of ads on solicitation websites to characterize online human trafficking behavior for a FBI project to counter international human traffickers.

Robotic Swarm Cybersystems, MIT Lincoln Laboratory (2013 - 2014) *Researcher*
• Explored jamming and Byzantine adversary vulnerabilities in distributed multi-robot systems
• Developed defensive mechanisms for quadcopter ad-hoc communication network

Goal-Oriented Scenario Modeling Robots, MIT Lincoln Laboratory (2012 –2013) *Researcher*
• Created incentive-based artificial intelligence system to emulate at scale human reactions to contemporary cybersecurity attacks on large networks; Trained system to real network data using reinforcement learning

Cyber Measurement Campaign, MIT Lincoln Laboratory (2012 – 2014) *Researcher*
• Developed a system to quantify the defensive capabilities of emerging memory-based randomization defenses, known as moving target defenses. Supported government deployment and testing of novel cybersecurity technologies

COLLEGE

The Princeton Tory (2008- 2012) *Editor-in-Chief, Staff Writer*
• Formulated articles for this magazine of moderate and conservative political thought
• Developed the magazine's website and associated blog site

Students and Workers for International Free Trade (2010-2012) *Founder and co-President*
• Founded group devoted to educating students about the benefits of nuanced international free trade policies in order to benefit the domestic US economy and developing nations
• Organized a nation-wide collegiate protest to reform corporate welfare in the US Farm Bill

Princeton Autonomous Vehicle Engineering Team (2008- 2011) *Team Member*
• Worked in collaborative, multi-disciplinary teams on electronic and mechanical hardware projects to autonomize a Ford Explorer

James Madison Program in American Ideals and Institutions (2008- 2012) *Undergraduate Fellow*
• Participated in seminars on Constitutional thought and political theory

Skills

• Programming languages: Python, R, Matlab, Stan, Java, C, and MIPS
• Amateur ornithologist, specializing in quail
• Experience with metal mills, lathes, laser cutters, and woodworking