WILLIAM N. HERLANDS

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EDUCATION

Carnegie Mellon University, Pennsylvania (September 2014-Present)
- PhD Student in Machine Learning and Public Policy; GPA: 4.00
- Advised by Dr. Daniel Neill
- Supported by National Science Foundation Graduate Research Fellowship and ARCS Fellowship

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

EMPLOYMENT

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 Principal Deputy, Assistant Secretary of Defense for Research and Engineering on implications of our research for national defense

Diana Furchtgott-Roth (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

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

RESEARCH

Machine Learning

Event Pattern Detection Laboratory, Carnegie Mellon University (2014 - Present) *Researcher*
- Developing anomaly detection algorithms to solve problems of public interest, focusing on urban analytics including traffic prediction and crime cluster detection
- Investigating novel methods for causal inference at the intersection of machine learning and econometrics

Trajectory Prediction Project, Carnegie Mellon University (2015 - Present) *Researcher*
- Developing general methods for time series prediction using function-to-function regression
- Applying to hospital setting to predict future vital signs and risk of cardiac events

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

Statistical Machine Learning and Homogeneous Music Classification (2011 –2012) *Researcher*
- Developed methods of differentiating between Mozart and Haydn's stylistically homogeneous string quartets, where humans have great difficulty distinguishing the two
- Built a machine learning system, which yields musicologically relevant results

General Science

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

Adaptive Motion Technologies, Maryland (2012) *Researcher*
• 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

Lightwave Communications Laboratory, Princeton University (2010- 2011) *Researcher*
• Constructed architecture to achieve stable excitatory and inhibitory feedback in a photonic neuron
• Model the thresholding function of a neuron's axon hillock using a nonlinear optical loop mirror

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

Princeton Autonomous Vehicle Engineering Team (2008- 2011) *Senior 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*
• Member of program exploring political thought, law, and politics

Program on Religion, Diplomacy, and International Relations (2012) *Fellow*
• Participated in discussion and policy groups about the effects of religion and culture on contemporary international relations and armed conflict

AWARDS

• 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 (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

• "A Machine Learning Approach to Musically Meaningful Homogeneous Style Classification", W. Herlands, R. Der, Y. Greenberg, S. Levin. Proceedings of the Twenty-Eighth AAAI Conference on Artificial Intelligence

• "Effective Entropy: Security-Centric Metric for Memory Randomization Technologies", W. Herlands, T. Hobson, and P. J. Donovan. Proceedings of the 7th USENIX conference on Cyber Security Experimentation

• "Intelligent Sensor Interconnection Networks Performing Signal Classification", W. Herlands, M. Fok, P. Prucnal. Poster at 2011 IEEE Conference on Photonic Interconnections with High Speed Digital Systems

Skills

• Proficient in Python, R, Java, and Matlab. Experience in C and MIPS
• Amateur ornithologist, specializing in quail
• Experience with metal mills, lathes, laser cutters, 3D printers, and woodworking