WILLIAM N. HERLANDS

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EDUCATION

PhD, Carnegie Mellon University, Pennsylvania (2020)
• PhD in Machine Learning and Public Policy; GPA: 4.03
• Advised by Dr. Daniel B. Neill and Dr. Andrew Gordon Wilson
• Doctoral dissertation: "Change modeling for understanding our world and the counterfactual one(s)"
• Coursework included: Advanced statistical machine learning, statistics theory, microeconomics, probabilistic graphical models, convex optimization, computational causation, and political philosophy.

Masters, Carnegie Mellon University, Pennsylvania (2017)
• Master of Science in Machine Learning; GPA: 4.03

Bachelors, Princeton University, New Jersey (2012)
• BSE in Electrical Engineering; GPA: 3.79
• Concentration in Machine Learning with minors in Computer Science and Near Eastern Studies

PUBLICATIONS

• "Automated Discovery of Difference-in-Differences", **Herlands**, Neill. *Working paper.*
• "Change Surfaces for Expressive Multidimensional Changepoints and Counterfactual Prediction", **Herlands**, Nickisch, Neill, Wilson. *Journal of Machine Learning Research* (JMLR) 2019.
• "Automated Local Regression Discontinuity Design Discovery", **Herlands**, McFowland III, Wilson, Neill. *Knowledge Discovery and Data Mining* (KDD) 2018.
• "Gaussian Process Subset Scanning for Anomalous Pattern Detection in Non-iid Data", **Herlands**, McFowland III, Wilson, Neill. *Artificial Intelligence and Statistics* (AISTATS), 2018.
• "Machine Learning for the Developing World", De-Arteaga, **Herlands**, Neill, Dubrawski, *ACM Transactions on Management Information Systems,* 2018.
• "Machine Learning for Drug Overdose Surveillance", Neill, **Herlands**. *Journal of Technology in Human Services,* 2018.
• "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.

ML PROJECTS

• "Crime is Hard: High Frequency Spatiotemporal Forecasting of Crime with Recurrent Neural Networks", Al-Shedivat, Fitzpatrick, **Herlands**.
• "Bivariate Kernel Space-Time Test for Leading Indicator Selection", **Herlands**, Neill.

ACADEMIC AWARDS

• George Duncan Award for Doctoral Excellence, Carnegie Mellon University (2018)
• Winner in National Institute for Justice's "Real-Time Crime Forecasting Challenge" (2017)
• Suresh Konda Award for the best 1st paper in public policy, Carnegie Mellon University (2016)
• National Science Foundation Graduate Research Fellowship (tuition and stipend award, 2014-2018)
• ARCS Foundation Fellowship (stipend award, 2014-2017)
• *Phi Beta Kappa*, liberal arts and sciences honor society (inducted 2012)
• *Sigma Xi*, scientific research honor society (inducted 2012)
• *Tau Beta Pi*, engineering honor society (inducted 2010)
• Calvin Dodd MacCracken Senior Thesis Award, Princeton University (2012)
• Charles Ira Young Memorial Tablet and Medal for excellent researcher, Princeton University (2012)
• Excellence in Engineering Funding, Princeton University (2011)
• Kamran Rafieyan '89 Fund for Undergraduate Research, Princeton University (2011 and 2010)

EMPLOYMENT **Obsecure, Massachusetts (2019-Present)** *Co-founder and CTO*

• Co-Founded ML-based cybersecurity company providing banks and fintechs guaranteed security in high-risk transactions. Manage engineering team and lead R&D.
• Invented patent pending cybersecurity solutions.
• Raised substantial (undisclosed) venture capital funding for a growing team of seven employees.

Willow, New York (2017-2019) *Co-founder and CEO*

• Built a direct-to-consumer eCommerce company providing high-quality wellness products for older adults.
• Raised $5.5M venture capital funding and managed a team of 15 employees.
• Sold in 2019 to large DTC wellness company.

NYU Center for Urban Science and Progress, New York (2017) *Researcher*

• Worked as a post-doc-equivalent researcher on the Urban Physiology project. Developed novel machine learning techniques for quantifying the anomalies and normal rhythms of complex urban data.

Boston Citywide Analytics Team, Massachusetts (2016) *Summer Fellow*

• Worked in Dept. of Innovation and Technology to bring cutting edge analytics to city government.
• Developed a natural language processing tool to process permit applications for actionable insights

Baron Public Affairs, Washington DC (2015-2017, 2019) *Consultant*

• Consulted on statistical methodology and big data technologies for political consulting firm.
• Developed massive network-based machine learning system for influence mapping in heterogeneous data.

Boston Citywide Analytics Team, Massachusetts (2014-2015) *Consultant researcher*

• Worked with Department of Transportation to develop randomized experiments and evaluation techniques to reduce congestion through real time predictive analytics and scheduling of public transportation.

MIT Lincoln Laboratory, Massachusetts (2012-2014) *Assistant Researcher*

• Conducted research on artificial intelligence, robotics, and cybersecurity.
• Initiated and managed project developing cyber-defenses for robotic swarms in unstructured environments.
• Guided Department of Defense officials on implications of our research for national defense.

TALKS

• "Change modeling for understanding our world and the counterfactual one(s)", *Carnegie Mellon University*, 2020.
• "Discovering Natural Experiments with Anomalous Pattern Detection", *Machine Learning for Good group, NYU,* 2020.
• "Automating Natural Experiments for Researchers who Hated Econometrics", *IBM Africa*, 2019.
• "Gaussian Process Subset Scanning for Anomalous Pattern Detection in Non-iid Data", *John Heinz III College at Carnegie Mellon University*, 2017.
• "Change Surfaces with Gaussian Processes", *GNS Healthcare*, 2017
• "Modeling and Detecting Patterns in Complex Urban Data", *Center for Urban Progress and Science, NYU*, 2017.
• "Generalized Difference-in-Difference Models with Gaussian Processes", *Joint Statistical Meetings*, 2016.
• "Scalable Gaussian Processes for Characterizing Multidimensional Change Surfaces", *John Heinz III College at Carnegie Mellon University*, 2016.
• "Small Area Spatiotemporal Crime Rate Forecasting", *The American Society of Criminology*, 2015.

TEACHING **Decision Analytics for Business and Policy 94-867, Carnegie Mellon (2017)** *Teaching Assistant*

• Taught recitations and review sessions for this Masters-level course in operations research.

Machine Learning 10-601, Carnegie Mellon (2016) *Teaching Assistant*

• Designed problem sets, tests, and taught recitations for Masters-level course in machine learning.

System Design and Analysis ELE301, Princeton (2012) *Teaching Assistant*

• Mentored and supervised electrical engineer students as they built and programmed autonomous vehicles

PROFESSIONAL SERVICE

- Co-Organized NeurIPS Workshop on Machine Learning for the Developing World, 2017, 2018
- Co-Organized NIPS Symposium on Interpretable Machine Learning, 2017
- Co-Organized NIPS Workshop on Interpretable Machine Learning for Complex Systems, 2016
- Program Committee for Artificial Intelligence and Statistics (AISTATS) 2019, 2021
- Program Committee for Uncertainty in Artificial Intelligence (UAI) 2021
- Program Committee for ACM Conference on Fairness, Accountability, and Transparency (FAccT) 2021
- Program Committee for Association for the Advancement of Artificial Intelligence (AAAI) 2021
- Program Committee for NeurIPS Workshop on Learning with Rich Experience (LIRE) 2019
- Program Committee for NeurIPS Workshop on Machine Learning for the Developing World 2019, 2020
- Program Committee for ICML Deep Generative Models Workshop 2018
- Reviewer for Neural Information Processing Systems (NeurIPS), 2017, 2018, 2019
- Reviewer for PLOS ONE, 2019
- Reviewer for Uncertainty in Artificial Intelligence (UAI), 2018, 2019
- Reviewer for International Society for Disease Surveillance (ISDS), 2018
- Reviewer for International Conference on Informational Systems (ICIS), 2017

Skills

- Programming languages: Python, R, Matlab, Stan, Java, and C
- Amateur quail farmer
- Experience with metal mills, lathes, laser cutters, and woodworking