Peter VanNostrand

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Research Interests

Explainable AI, Algorithmic Bias, Human-Centric Computing, Responsible Data Science

Education

Worcester Polytechnic Institute   Worcester, MA
PhD in Data Science, Current GPA 4.0/4.0   Aug 2020 - Present

Worcester Polytechnic Institute   Worcester, MA
MS in Data Science, GPA 4.0/4.0   Aug 2020 – Dec 2022

University at Buffalo, The State University of New York   Buffalo, NY
BS in Computer Engineering, Electrical Engineering, GPA: 3.94/4.0   Aug 2016 –May 2020

Publications

Pluto: Sample Selection for Robust Anomaly Detection on Polluted Log Data
Lei Ma, Lei Cao, Peter M. VanNostrand, Dennis M. Hofmann, Elke A. Rundensteiner
Proceedings of the ACM on Management of Data 2025 (SIGMOD '25)

Actionable Recourse for Automated Decisions: Examining the Effects of Counterfactual Explanation Type and Presentation on Lay User Understanding
Peter M. VanNostrand, Dennis M. Hofmann, Lei Ma, Elke A. Rundensteiner
Proceedings of ACM Conference on Fairness, Accountability, and Transparency (FAccT '24)

FACET: Robust Counterfactual Explanation Analytics
Peter M. VanNostrand, Huayi Zhang, Dennis M. Hofmann, Elke A. Rundensteiner
Proceedings of the ACM on Management of Data 2023 (SIGMOD '23)

A Demonstration of AutoOD: a Self-Tuning Anomaly Detection System
Dennis Hofmann, Peter VanNostrand, Huayi Zhang, Yizhou Yan, Lei Cao, Samuel Madden, Elke Rundensteiner
Proceedings of the VLDB Endowment 2022 (VLDB '22)

ELITE: Robust Deep Anomaly Detection with Meta Gradient
Huayi Zhang, Lei Cao, Peter VanNostrand, Samuel Madden, Elke A. Rundensteiner
Proceedings ACM SIGKDD Conference on Knowledge Discovery & Data (KDD '21)

Confidential Deep Learning: Executing Proprietary Models on Untrusted Devices
Peter M. VanNostrand, Ioannis Kyriazis, Michelle Cheng, Tian Guo, Robert J. Walls
arXiv:1908.10730 2019

Presentations

Apr 2023   **FACET: Finding Actionable Explanations for Unwanted AI Predictions**
                      Peter M. VanNostrand, Huayi Zhang, Dennis Hofmann, and Elke A. Rundensteiner
                      WPI Graduate Research Innovation Exchange (Poster Presentation)

Apr 2021   **Leveraging Labeled Examples for Robust Deep Anomaly Detection**

Peter VanNostrand, Huayi Zhang, Lei Cao, Samuel Madden, and Elke Rundensteiner
WPI Graduate Research Innovation Exchange (Poster Presentation)

Sept 2019   **Confidential Deep Learning: Executing Proprietary Models on Untrusted Devices**
Peter M. VanNostrand, Ioannis Kyriazis, Michelle Cheng, Tian Guo, Robert J. Walls
Great Lakes Security Day (Research Talk)

Apr 2019   **Optimized Simultaneous Localization and Mapping for Resource Limited Systems**
Peter VanNostrand, Karthik Dantu
SUNY Undergraduate Research Conference (Poster Presentation)

Teaching and Mentorship

Project Mentor, WPI Major Qualifying Project – Explainable AI   Aug 2023 – May 2024
Guided a team of five undergraduate students in their first research project focusing on human-computer interfaces and design to create a lay user appropriate explanation UI

Project Mentor, WPI Major Qualifying Project – Anomaly Detection   Aug 2023 – May 2024
Guided a team of four undergraduate students in their first research project to develop a deployable web platform for domain experts to leverage deep anomaly detection methods

Guest Lecturer, WPI NSF Research Experience for Undergraduates   Summers 2020-2023
Served as a guest lecturer for the REU site *Interdisciplinary Data Science Research for Healthy Communities in the Digital Age* instructing 20+ students annually on best research practices and effective communication and presentation

Professional Experience

- Graduate Research Assistant, Worcester Polytechnic Institute   Aug 2020 – Present
- Undergraduate Research Assistant, Worcester Polytechnic Institute   May 2019 – Sep 2019
- Undergraduate Research Assistant, University at Buffalo   Jun 2018 – May 2019
- Full Stack Web Developer, Software Solutions Inc   May 2017 – Aug 2017

Honors and Awards

- FAccT Travel Award, Association of Computer Machinery   Jun 2024
- CEDAR PhD Fellowship (2 years Tuition/Spend), National Science Foundation   Aug 2023
- People's Choice Poster (3rd Place), Graduate Research Innov. Exchange, WPI   Apr 2023
- Best Poster Runner Up, Graduate Research Innovation Exchange, WPI   Apr 2022
- Community-Building Award, WPI Data Science Department   May 2021, May 2022
- GAANN PhD Fellowship (3 years Tuition/Spend), U.S. Dept of Education   Aug 2020
- Eagle Scout, Boy Scouts of America   Aug 2016

Skills & Tools

Skills: crowd sourced experimentation, A/B testing, dashboard design, data visualization, algorithmic auditing, technical/grant writing, project management, communication, policy

Tools: Python (Pytorch, Numpy, Pandas, Scikit-Learn, Jupyter), Javascript (React, D3, Node, JQuery), SQL, Java, C++, Git, Bash, LaTeX, MS Office, Adobe Illustrator, Davinci Resolve