

# Peter VanNostrand

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## Research Interests

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

## Education

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<b>Worcester Polytechnic Institute</b> PhD in Data Science, Current GPA 4.0/4.0	Worcester, MA Aug 2020 - Present
<b>Worcester Polytechnic Institute</b> MS in Data Science, GPA 4.0/4.0	Worcester, MA Aug 2020 – Dec 2022
<b>University at Buffalo, The State University of New York</b> BS in Computer Engineering, Electrical Engineering, GPA: 3.94/4.0	Buffalo, NY Aug 2016 – May 2020

## Publications

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### **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)

### **Counterfactual Explanation Analytics: Empowering Lay Users to Take Action Against Consequential Automated Decisions**

*Peter M. VanNostrand, Dennis M. Hofmann, Lei Ma, Belisha Genin, Randy Huang, and Elke A. Rundensteiner.*  
Proceedings of the VLDB Endowment (VLDB '24)

### **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

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- 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

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- 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

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- 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

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- 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 (3<sup>rd</sup> 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**

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**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

## **References**

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Available upon request