Curriculum Vitae

Walter Gerych
Assistant Professor @ WPI

Personal Webpage: waltergerych.github.io
wgerych@wpi.edu
585-808-4894

Research Interests

My research is on Trustworthy Machine Learning, with a focus on debiasing large pretrained models using efficient and minimally invasive approaches that maintain downstream performance.

Professional Positions

WPI Computer Science, Assistant Professor — 07/2025–Current
— Tenure-track assistant professor of Computer Science and AI.

MIT CSAIL & LIDS, Postdoctoral Associate — 10/2023–07/2025
— *Postdoc Advisor: Prof. Marzyeh Ghassemi*
— Worked in the Healthy ML research group
— Researched methods to debias pretrained models, developing measures of LLM and ML uncertainty, auditing generative models in clinical settings, and verifying generative models

Worcester Polytechnic Institute, Research Assistant — 06/2018–10/2023
— *PhD Advisors: Prof. Elke Rundensteiner, Prof. Emmanuel Agu*
— Member of the DAISY Research group and the WPI WASH research project.
— Research included machine learning under noisy labels, positive unlabeled learning, generative modeling, model debiasing, and machine learning for human activity recognition

IBM Research, Research Scientist Intern — 05/2-23–08/2023
— *Mentor: Yara Rizk, Manager: Vatche Isahagian*
— Conducted research into measuring confidence of large language models (LLMs)
— Developed unsupervised system to select the optimal LLM and template for each user query
— Submitted & published AAAI paper
— Submitted patent disclosure on system developed during internship (currently under review)

MIT Lincoln Lab, Intern — 05/2022–10/2023
— *Manager: John Moores*
— Developed deep models to forecast optical turbulence timeseries
— Created novel multi-stream Seq2Seq network to incorporate asynchronous exogenous variable streams for optical turbulence prediction

Kansas State University, Research Intern — 05/2015–08/2015
— *Mentor: Jeremy LeCrone*
— Developed cellular automata method for modeling mean curvature flow

Education

Worcester Polytechnic Institute, Worcester, MA — 2017–2023
PhD, Data Science — 2023
— Dissertation: *Leveraging Mislabeled Datasets And Improving Imperfect Pretrained Models*
MS, Data Science — 2019
GPA: 4.0/4.0

SUNY Geneseo, Geneseo, NY — 2013–2017
BS, Mathematics
Edgar Fellows Honors Program

Publications

39. Learning under Temporal Label Noise.
Sujay Nagaraj, **Walter Gerych**, Sana Tonekaboni, Anna Goldenberg, Berk Ustun, Thomas Hartvigsen. **ICLR**, 2025.

38. Mapping from Meaning: Addressing the Miscalibration of Prompt-Sensitive Language Models.
Kyle Cox, Jiawei Xu, Yikun Han, Rong Xu, Tianhao Li, Chi-Yang Hsu, Tianlong Chen, **Walter Gerych**, Ying Ding. (To Appear In) **AAAI**, 2025.

37. The Surprising Effectiveness of Infinite-Width NTKs for Characterizing and Improving Model Training.
Joshua DeOliveira, **Walter Gerych**, Elke Rundensteiner. (To Appear In) **AAAI**, 2025.

36. BENDVLM: Test-Time Debiasing of Vision-Language Embeddings.
Walter Gerych, Haoran Zhang, Kimia Hamidieh, Eileen Pan, Maanas Sharma, Thomas Hartvigsen, Marzyeh Ghassemi. **NeurIPS**, 2024.

35. Identifying Implicit Social Biases in Vision-Language Models.
Kimia Hamidieh, Haoran Zhang, **Walter Gerych**, Thomas Hartvigsen, Marzyeh Ghassemi. **AIES**, 2024.

34. TAXI: Evaluating Categorical Knowledge Editing for Language Models.
Derek Powell, **Walter Gerych**, Thomas Hartvigsen. **ACL**, 2024.

33. Who Knows the Answer? Finding the Best Model & Prompt Using Confidence-Based Search.
Walter Gerych, Yara Rizk, Vatche Isahagian, Vinod Muthusamy, Evelyn Duesterwald, Praveen Venkateswaran. **AAAI**, 2024.

32. Amalgamating Multi-Task Models with Heterogeneous Architectures.
Jidapa Thadajarassiri, **Walter Gerych**, Xiangnan Kong, Elke Rundensteiner. **AAAI**, 2024.

31. Debiasing Pretrained Generative Models By Uniformly Sampling Semantic Attributes.
Walter Gerych, Kevin Hickey, Luke Buquicchio, Kavin Chandrasekaran, Abdulaziz Alajaji, Emmanuel Agu, Elke Rundensteiner. **NeurIPS**, 2023.

30. Stabilizing Adversarial Training for Generative Networks.
Walter Gerych*, Kevin Hickey* (Joint First Author), Thomas Hartvigsen, Luke Buquicchio, Abdulaziz Alajaji, Kavin Chandrasekaran, Hamid Mansoor, Emmanuel Agu, Elke Rundensteiner. **IEEE Big Data MLDB**, 2023.

29. Population-Level Visual Analytics of Smartphone Sensed Health Using Community Phenotypes.
Hamid Mansoor, **Walter Gerych**, Abdulaziz Alajaji, Luke Buquicchio, Kavin Chandrasekaran, Emmanuel Agu, Elke Rundensteiner. **IEEE ICHI**, 2023.

28. Adversarial Human Context Recognition: Evasion Attacks and Defenses.
Abdulaziz Alajaji, **Walter Gerych**, Kavin Chandrasekaran, Luke Buquicchio, Emmanuel Agu, Elke Rundensteiner. **IEEE COMPSAC**, 2023.

27. Knowledge Amalgamation for Multi-Label Classification via Label Dependency Transfer.
Jidapa Thadajarassiri, Thomas Hartvigsen, **Walter Gerych**, Xiangnan Kong, Elke Rundensteiner. **AAAI**, 2023. *Oral Spotlight.*

26. Domain Adaptation Methods for Lab-to-Field Human Context Recognition.
Abdulaziz Alajaji, **Walter Gerych**, Luke Buquicchio, Kavin Chandrasekaran, Hamid Mansoor, Emmanuel Agu, Elke Rundensteiner. **Sensors** 23(6), 2023.

25. INPHOVIS: Interactive Visual Analytics For Smartphone-Based Digital Phenotyping.
Hamid Mansoor, **Walter Gerych**, Abdulaziz Alajaji, Luke Buquicchio, Kavin Chandrasekaran, Emmanuel Agu, Elke Rundensteiner, Angela Incollingo Rodriguez. **Visual Informatics**, 2023.

24. HAR-CTGAN: A Mobile Sensor Data Generation Tool for Human Activity Recognition.
Joshua DeOliveira, **Walter Gerych**, Aruzhan Koshkarova, Elke Rundensteiner, Emmanuel Agu. **IEEE Big Data 4th Special Session on HealthCare Data**, 2022.

23. Text Generation to Aid Depression Detection: A Comparative Study of Conditional Sequence GANs.
ML Tlachac, **Walter Gerych**, Kratika Agrawal, Benjamin Litterer, Nicholas Jurovich, Saitheeraj Thatigotla, Jidapa Thadajarassiri, Elke Rundensteiner. **IEEE Big Data 4th Special Session on HealthCare Data**, 2022.

22. Positive Unlabeled Learning with a Sequential Selection Bias.
Walter Gerych, Thomas Hartvigsen, Luke Buquicchio, Emmanuel Agu, Elke Rundensteiner. **SDM**, 2022.

21. Robust Recurrent Classifier Chains for Multi-Label Learning with Missing Labels.
Walter Gerych, Thomas Hartvigsen, Luke Buquicchio, Emmanuel Agu, Elke Rundensteiner. **CIKM**, 2022.

20. Stop&Hop: Early Classification of Irregular Time Series.
Thomas Hartvigsen, **Walter Gerych**, Jidapa Thadajarassiri, Xiangnan Kong, Elke Rundensteiner. **CIKM**, 2022.

19. Recovering The Propensity Score From Biased Positive Unlabeled Data.
Walter Gerych, Thomas Hartvigsen, Luke Buquicchio, Emmanuel Agu, Elke Rundensteiner. **AAAI**, 2022. *Oral Spotlight.*

18. On Detecting COVID-Risky Behavior from Smartphones.
Thomas Hartvigsen*, **Walter Gerych*** (Joint First Author), Marzyeh Ghassemi. **Workshop on Epidemiology meets Data Mining and Knowledge Discovery, KDD**, 2022.

17. Triplet-based Domain Adaptation (Triple-DARE) for Lab-to-Field Human Context Recognition.
Abdulaziz Alajaji, **Walter Gerych**, Luke Buquicchio, Kavin Chandrasekaran, Hamid Mansoor, Emmanuel Agu, Elke Rundensteiner. **IEEE PerCom Industry Track**, 2022.

16. Recurrent Bayesian Classifier Chains for Exact Multi-Label Classification.
Walter Gerych, Tom Hartvigsen, Luke Buquicchio, Emmanuel Agu, Elke Rundensteiner. **NeurIPS**, 2021.

15. GAN For Generating User-Specific Human Activity Data From An Incomplete Training Corpus.
Walter Gerych, Harrison Kim, Joshua DeOliveira, MaryClare Martin, Luke Buquicchio, Kavin Chandrasekaran, Abdulaziz Alajaji, Hamid Mansoor, Emmanuel Agu, Elke Rundensteiner. **IEEE Big Data 4th Special Session on HealthCare Data**, 2021.

14. Variational Open Set Recognition.
Luke Buquicchio, **Walter Gerych**, Kavin Chandrasekaran, Abdulaziz Alajaji, Hamid Mansoor, Thomas Hartvigsen, Elke Rundensteiner, Emmanuel Agu. **IEEE Big Data**, 2021.

13. Local Geometry Preserving Deep Networks For Featurizing High-Dimensional Datasets.
Walter Gerych, Jessica Bader, Declan Nelson, Thalia Chai-Zhang, Luke Buquicchio, Abdulaziz Alajaji, Kevin Chandrasekaran, Emmanuel Agu, Elke Rundensteiner. **IEEE ICMLA**, 2021.

12. Few-Shot Classification for Human Context Recognition Using Smartphone Data Traces.
Luke Buquicchio, **Walter Gerych**, Abdulaziz Alajaji, Kavin Chandrasekaran, Hamid Mansoor, Emmanuel Agu, Elke Rundensteiner. **IEEE ICMLA**, 2021.

11. Visual Analytics of Smartphone-Sensed Human Behavior and Health.
Hamid Mansoor, **Walter Gerych**, Abdulaziz Alajaji, Luke Buquicchio, Kavin Chandrasekaran, Emmanuel Agu, Elke Rundensteiner. **IEEE Computer Graphics and Applications**, 2021.

10. Smartphone Health Biomarkers: Positive Unlabeled Learning of In-the-Wild Contexts.
Abdulaziz Alajaji, **Walter Gerych**, Luke Buquicchio, Kavin Chandrasekaran, Emmanuel Agu, Elke Rundensteiner. **Pervasive Computing**, 2021.

9. Measuring Group Advantage: A Comparative Study of Fair Ranking Metrics.
Caitlin Kuhlman*, **Walter Gerych*** (Joint First Author), Elke A. Rundensteiner. **AIES**, 2021.

8. PLEADES: Population Level Observation of Smartphone Sensed Symptoms for In-the-Wild Data.
Hamid Mansoor, **Walter Gerych**, Abdulaziz Alajaji, Luke Buquicchio, Kavin Chandrasekaran, Emmanuel Agu, Elke Rundensteiner. **VISIGRAPP**, 2021.

7. Complex Activity Recognition Using Topic Models for Feature Generation from Wearable Sensor Data.
Kavin Chandrasekaran, **Walter Gerych**, Luke Buquicchio, Abdulaziz Alajaji, Emmanuel Agu, Elke Rundensteiner. **SMARTCOMP**, 2021.

6. BurstPU: Classification of Weakly Labeled Datasets with Sequential Bias.
Walter Gerych, Luke Buquicchio, Kavin Chandrasekaran, Abdulaziz Alajaji, Hamid Mansoor, Aidan Murphy, Emmanuel Agu, Elke Rundensteiner. **IEEE Big Data**, 2020.

5. INTOSIS: Interactive Observation of Smartphone Inferred Symptoms for In-The-Wild Data.
Hamid Mansoor, **Walter Gerych**, Luke Buquicchio, Abdulaziz Alajaji, Kavin Chandrasekaran, Emmanuel Agu, Elke Rundensteiner. **IEEE Big Data**, 2020.

4. DeepContext: Parameterized Compatibility-Based Attention CNN for Human Context Recognition.
Abdulaziz Alajaji, **Walter Gerych**, Kavin Chandrasekaran, Luke Buquicchio, Emmanuel Agu, Elke Rundensteiner. **ICSC**, 2020.

3. ARGUS: Interactive Visual Analytics Framework for the Discovery of Disruptions in Bio-Behavioral Rhythms.
Hamid Mansoor, **Walter Gerych**, Luke Buquicchio, Kavin Chandrasekaran, Emmanuel Agu, Elke Rundensteiner. **EuroVis (Short Papers)**, 2020.

2. COMEX: Identifying Mislabeled Human Behavioral Context Data Using Visual Analytics.
Hamid Mansoor, **Walter Gerych**, Luke Buquicchio, Kavin Chandrasekaran, Emmanuel Agu, Elke Rundensteiner. **COMPSAC**, 2019.

1. Classifying Depression in Imbalanced Datasets Using Autoencoder-Based Anomaly Detection.
   Walter Gerych, Emmanuel Agu, Elke Rundensteiner. **ICSC**, 2019.

▬▬▬ Recent Preprints

1. MaskMedPaint: Masked Medical Image Inpainting with Diffusion Models for Mitigation of Spurious Correlations.
   Qixuan Jin, **Walter Gerych**, Marzyeh Ghassemi.

▬▬▬ Supervised Undergraduate Publications

3. Human Context Recognition: A Controllable GAN Approach.
   Joshua DeOliveira, Harrison Kim, MaryClare Martin, **Walter Gerych**, Elke Rundensteiner. IEEE URTC, 2021

2. Positive Unlabeled Gradient Boosting.
   Caitlin Timmons, Andrea Boskovic, Sreeharsha Lakamsani, **Walter Gerych**, Luke Buquicchio, Elke Rundensteiner. IEEE URTC, 2020

1. Neural Network for Nonlinear Dimension Reduction Through Manifold Recovery.
   Jessica Bader, Declan Nelson, Thalia Chai-Zhang, **Walter Gerych**, Elke Rundensteiner. IEEE URTC, 2019

▬▬▬ Selected Honors and Awards

DARPA Riser, DARPA	2022
— DARPA award for early-career scientists identified as up-and-coming in their field	
Data Science Leadership Award, WPI	2020, 2021
Best Poster, Graduate Research Innovation and Exchange, WPI	2021, 2022
Best Poster, Graduate Research Innovation and Exchange, WPI	2020
V. Ambujamma Memorial Scholarship, SUNY Geneseo	2016
— For outstanding achievement as a student of mathematics	

▬▬▬ Teaching/Mentoring

I have mentored teams of REU students every summer since 2019. I have also mentored teams of students on their "Major Qualifying Projects" (year-long capstone projects) at WPI, and undergraduates at MIT as part of MIT's Undergraduate Research Opportunities Program.. I typically give the students a research topic and direction, and then meet with them at least twice a week to resolve any issues and provide next steps.

▬▬▬ Students Advised:

Anastasia Dunca, BS, MIT	08/2024–Current
Maanas Sharma, BS, MIT	02/2024–Current
Nathan Zekarias, BS, UMD	05/2024–11/2024
Joshua DeOliveira, MS, WPI	05/2021–05/2023
Cindy Trac, BS, WPI	08/2022–05/2023
Sirut Buasai, BS, WPI	08/2022–05/2023
Jason Dykstra, BS, WPI	08/2022–05/2023
Dillon McCarthy, BS, WPI	08/2022–05/2023
Aruzhan Koshkarova, BS, WPI	05/2022–08/2022
Alek Lewis, BS, WPI	08/2021–05/2022
Ryan Astor, BS, WPI	08/2021–05/2022
Kyle Costello, BS, WPI	08/2021–05/2022
Harrison Kim, BS, Northeastern University	05/2021–08/2021

MaryClare Martin, BS, Holy Cross	05/2021–08/2021
Jesse Abeyta, BS, WPI	08/2020–05/2021
Vinay Nair, BS, WPI	08/2020–05/2021
Nicholas Cheng, BS, WPI	08/2020–05/2021
Bryan Gass, BS, WPI	08/2020–05/2021
Caitlin Timmons, BS, Smith College	05/2020–08/2020
Andrea Boskovic, BS, Amherst College	05/2020–08/2020
Sreeharsha Lakamsani, BS, Arizona State University	05/2020–08/2020
Jessica Bader, BS, Iowa State University	05/2019–08/2019
Declan Nelson, BS, Georgia Institute of Technology	05/2019–08/2019
Thalia Chao-Zhang, BS, Bard College	05/2019–08/2019

Seminars

SERC Project Group Leader, MIT	2024–Current

— Group leader in MIT's Social and Ethical Responsibilities of Computing Scholar's program
— Lead a group 10 students in weekly seminars on methods to combat bias in generative models

Service

Departmental Service

Data Science Student Council, WPI	2018–2023
— President	2021-2023
— Vice President	2021–2021
PhD Peer Mentor, WPI	2020–2023
Judge for Graduate Qualifying Project Research Exchange, WPI	2021
Volunteer at Women in Data Science Conference @ WPI, WPI	2020, 2021
Lead Tutorial on Creating Engaging Research Presentations for Graduate Students, WPI	2022
Lead Tutorial on Creating Engaging Research Presentations for Undergraduate Students, WPI	2021
Lead Tutorial on Deep Learning with PyTorch for Undergraduate Students, WPI	2021

Professional Service

Time Series For Health workshop at ICLR 2024 (TS4H @ ICLR 2024)	2024

— Organizer

AHLI Conference on Health, Inference, and Learning (CHIL 2024)	2024

— Senior Area Chair (Methods Track)

Reviewer
— **NeurIPS**, **AAAI**, CVPR, KDD, ML4H, CHIL