GUANGYAO (THOMAS) ZHENG

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EDUCATION

Rice University Houston, TX
Ph.D. in Computer Science *2022 August - Present*
Advisors: Dr. Vladimir Braverman [website]; Dr. Michael A. Jacobs (Vice-chair)[website]
Research interests: Machine learning, artificial intelligence, algorithm development, deep learning, reinforcement learning, continual learning, medical imaging, computer vision, signal processing and analysis, optimization

Johns Hopkins University Baltimore, MD
B.s. in Applied Mathematics and Statistics; minor in Computer Science *2018 August - 2022 June*
Advisors: Dr. Vladimir Braverman [website]; Dr. Yinzhi Cao [website]; Dean's List 2019-2022

RESEARCH EXPERIENCE

Rice University, Computer Science Department Houston, TX
Ph.D. Candidate; Advisors: Dr. Vladimir Braverman, Dr. Michael A. Jacobs *2022 August - Present*

- Collaboration with Johns Hopkins University, UTHealth McGovern Medical School, and University of Maryland on Shared Experience Lifelong Learning supported by DARPA grant: DARPA-PA-20-02-11-HR00112190130
- Engaging in dynamic collaboration with NASA, UTHealth McGovern Medical School, and the University of Maryland to advance the field of deep lifelong reinforcement learning in medical imaging
- Facilitating a robust collaboration with Korea Institute for Advancement of Technology (KIAT), MEZOO, and Hallym University on novel arrhythmia multi-label classification and future onset prediction for noisy wearable device ECG data.
- Leading a collaborative initiative with Baylor College of Medicine (Dr. Livia Eberlin) on benign or malignant thyroid cancer prediction using mass spectrometry data.
- Fostering a proactive collaboration with Baylor College of Medicine (Dr. Nandan Mondal) on predicting the risk of stroke after receiving an LVAD heart transplant before surgery with few-shot learning methods data.

Johns Hopkins University, Computer Science Department Baltimore, MD
Research Assistant to Dr. Vladimir Braverman, Dr. Yinzhi Cao *2020 August - 2022 July*

- Led pioneering research under the guidance of Dr. Vladimir Braverman on Fast scRNA-seq clustering using Jensen–Shannon divergence and Leiden clustering algorithm.
- Conducted cutting-edge research under the mentorship of Dr. Yinzhi Cao on exploring the vulnerability caused by Web Cache Poisoning for exploitable websites' security to protect people's information from malicious attackers.
- Conducted comprehensive research under the mentorship of Dr. Yinzhi Cao, investigating the vulnerabilities stemming from Prototype Pollution to bolster the security of exploitable websites. Dedicated efforts towards safeguarding sensitive information from malicious attackers.

PUBLICATIONS

Journal/ConferencePapers

[1] A Collective AI via Lifelong Learning and Sharing at the Edge
Soltoggio, A., Ben-Iwhiwhu, E., Braverman, V., Eaton, E., Epstein, B., Ge, Y., Halperin, L., How, J., Itti, L., Jacobs, MA, Kantharaju, P., Le, L., Lee, S., Liu, X., Monteiro, S., Musliner, D., Nath, S., Panda, P., Peridis, C., Pirsiavash, H., Parekh, VS, Roy, K., Shperberg, S., Siegelmann, H., Stone, P., Vedder, K., Wu, J., Yang, L., **Zheng, G.**, Kolouri, S.
Nature Machine Intelligence (forthcoming)

[2] Selective experience replay compression using coresets for lifelong deep reinforcement learning in medical imaging
Guangyao Zheng, Samson Zhou, Vladimir Braverman, Michael A Jacobs, Vishwa S Parekh
Medical Imaging with Deep Learning 2023

Workshops

[1] Asynchronous Decentralized Federated Lifelong Learning for Landmark Localization in Medical Imaging
Guangyao Zheng, Michael A Jacobs, Vladimir Braverman, Vishwa S Parekh
FL4Data-Mining at SIGKDD 2023

Papers Under Review

[1] Lifelong deep reinforcement learning on the edge for medical imaging
Guangyao Zheng, Shuhao Lai, Michael A Jacobs, Vladimir Braverman, Vishwa S Parekh
International Symposium on Biomedical Imaging 2024

[2] Hierarchical Deep Learning for Autonomous Multi-label Arrhythmia Detection and Classification on Real-world Wearable ECG Data
Guangyao Zheng, Sunghan Lee, Jeonghwan Koh, Kushubu Pahwa, Haoran Li, Zicheng Xu, Haiming Sun, Junda Su, Sung Pil Cho, Sung Il Im, In cheol Jeong, Vladimir Braverman
IEEE Journal of Biomedical and Health Informatics

Working

[1] Multi-environment lifelong deep reinforcement learning for medical imaging
Guangyao Zheng, Shuhao Lai, Michael A Jacobs, Vladimir Braverman, Vishwa S Parekh

[2] New understanding of lifelong deep reinforcement learning on human anatomy and landmark localization
Guangyao Zheng, Shuhao Lai, Michael A Jacobs, Vladimir Braverman, Vishwa S Parekh

[3] Democratizing Healthcare AI with Shared Experience Lifelong Learning on the Edge
Guangyao Zheng, Shuhao Lai, Michael A Jacobs, Vladimir Braverman, Vishwa S Parekh

[4] Source Agonistic Lifelong Reinforcement Learning with Selective Experience Replay
Guangyao Zheng, Shuhao Lai, Michael A Jacobs, Vladimir Braverman, Vishwa S Parekh

HONORS & AWARDS

Google Cloud Academic Research Grant 2023
UTHealth 4th Annual Diagnostic and Interventional Imaging Retreat Best Presenter 2023

SKILLS

Programming Languages and Frameworks
Python, Java, C, C++, MATLAB, R, HTML, Latex
Proficient in both TensorFlow and Pytorch

Languages
Fluent in English, Chinese, Japanese, and French