Quanling Zhao

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Last Update: 9/16/2024

Research Interest

- Machine Learning theory, Kernel method.
- Novel learning paradigms: Online, Few-shot, Federated, Continual, Unsupervised, Multimodal Learning.
- Efficient neuromorphic computing methods: Vector Symbolic Architecture/Hyperdimensional Computing.

Education

•University of California San Diego *2024 - Present*
PhD - Computer Science CA, USA

•University of California San Diego *2023*
B.S. - Computer Science - GPA: 3.812/4.0 CA, USA

Experience

System Energy Efficiency Lab *2022 - Present*
Graduate student researcher, Advisor: Tajana Rosing UCSD
- Theory of hyperdimensional computing / vector symbolic architecture.
- Applicable and efficient machine learning for various applications.

The Institute for Learning-enabled Optimization at Scale *2022 - Present*
Researcher UCSD
- Federated learning in Hierarchical IoT Network and multimodal learning on sensor data.

Early Research Scholar Program *2021 - 2022*
Undergraduate Researcher, Advisor: Christine Alvarado UCSD
- Robust and efficient Federated Learning algorithms in IoT setting.

Publications

1. **Quanling Zhao**, Xiaofan Yu, Shengfan Hu, Tajana Rosing, "MultimodalHD: Federated Learning Over Heterogeneous Sensor Modalities using Hyperdimensional Computing" - *Design, Automation, and Test in Europe (DATE), 2024*

2. **Quanling Zhao**, Anthony Thomas, Ari Brin, Xiaofan Yu, Tajana Rosing, "Unleashing Hyperdimensional Computing with Nyström Method based Encoding" - *MLNCP@NeurIPS, 2023*

3. **Quanling Zhao**, Xiaofan Yu, Tajana Rosing, "“Poster Abstract: Attentive Multimodal Learning on Sensor Data using Hyperdimensional Computing" - *ACM/IEEE International Conference on Information Processing in Sensor Networks (IPSN), 2023*

4. Xiaofan Yu, Ludmila Cherkasova, Harsh Vardhan, **Quanling Zhao**, Emily Ekaireb, Xiyuan Zhang, Arya Mazumdar, Tajana Rosing, "Async-HFL: Efficient and Robust Asynchronous Federated Learning in Hierarchical IoT Networks" - *ACM/IEEE Conference on Internet of Things Design and Implementation (IoTDI), 2023*

5. **Quanling Zhao**, Kai Lee, Jeffrey Liu, Muhammad Huzaifa, Xiaofan Yu, Tajana Rosing, "FedHD: Federated Learning with Hyperdimensional Computing" - *ACM Annual International Conference on Mobile Computing And Networking (MobiCom) Demo, 2022*

6. Emily Ekaireb, Xiaofan Yu, Kazim Ergun, **Quanling Zhao**, Kai Lee, Muhammad Huzaifa, Tajana Rosing, "ns3-fl: Simulating Federated Learning with ns-3" - *Workshop on ns-3 (WNS3), 2022*

Awards

Computer Science & Engineering annual Awards *June 2023*
Excellence in Research - One among two recipients in graduating class. UCSD

Courses & Skills

- Language: English (Full professional proficiency), Chinese (Native)
- Java, C/C++, Python, Matlab, System Verilog.
- LaTeX, Git, Markdown, Kubernetes.
- Build deep learning architectures using Pytorch, TensorFlow.
- Math: Statistics/probability, calculus, differential eq, discrete, graph theory, linear optimization, linear algebra.
- Computer Science: Networks, programming language, cryptography, computing theory, data structure, circuits/computer architecture, ML/AI/DL/Recommander System.