Jon Maravilla

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Education

Oakland University Expected May 2029
B.S. in Computer Science GPA: 3.96/4.00

Research Interests

Sustainable AI and Efficient Agentic Systems, with an emphasis on reducing the computation, energy consumption, and inference cost of generative models and agent orchestration. Additional interests include model compression, quantization, knowledge distillation, and efficient deep learning systems.

Research Experience

Undergraduate Research Assistant Sep. 2025 – Present
Efficient AI Lab, Oakland University
Faculty advisor: Dr. Kaiqi Zhao; PhD mentor: Justin Kur

- **Led DiTCarbon**, developing its methodology and implementation, designing and conducting experiments, evaluating results, and writing the first-author manuscript. The framework predicts energy use and carbon emissions for AI image and video generation, reducing energy-prediction error by **36%** versus a runtime-informed baseline and **59%** versus a learned baseline.
- Built **PyTorch evaluation and transfer-learning pipelines** for data-augmented quantization-aware knowledge distillation, improving Top-1 test accuracy by up to **10%** for sub-8-bit CNNs.
- Improved **Qwen3.5-4B inference latency by 4.7**× on an AWS A10G GPU while preserving over **90% of baseline quality** through speculative decoding, pruning, and selective quantization.

Publications

DiTCarbon: Predictive Carbon Footprint Estimation for Diffusion Transformer Inference
Maravilla, J., Kur, J., and Zhao, K. (2026).
Accepted. Trustworthy AI4Good Workshop, International Conference on Machine Learning (ICML 2026).

Data-Augmented Quantization-Aware Knowledge Distillation
Kur, J., **Maravilla, J.**, and Zhao, K. (2026).
Accepted. International Joint Conference on Neural Networks (IJCNN), IEEE WCCI 2026.

Papers Under Review

DiTCarbon: Predicting Runtime and Lifecycle Carbon for Diffusion Transformers
Maravilla, J., Kur, J., and Zhao, K. (2026).
Under review. Association for the Advancement of Artificial Intelligence (AAAI), 2027.

Substantially expanded version of the ICML 2026 workshop paper.

Honors and Awards

NSF S-STEM Scholarship, Oakland University 2026

Hackathon Winner, Hacktoberfest × GrizzHacks 2026

Selected Project

AI Figure Skating Jump Analyzer
Independent computer vision project
Python, PyTorch, Streamlit, CVAT

- Built a video-classification pipeline using 2D and 3D CNNs and a custom CVAT-annotated dataset to identify figure-skating jumps.
- Developed an interactive Streamlit application demonstrating jump classification; project received positive feedback from the International Skating Union.

Technical Skills

Programming and Frameworks: Python, PyTorch, JavaScript, SQL, OpenCV, Streamlit

ML and Systems: Generative AI, multi-agent orchestration, model compression, quantization, knowledge distillation, GPU profiling, inference optimization

Tools: Linux/Unix, Git, Docker, AWS, CVAT, LaTeX

Additional Experience and Leadership

Assistant Learn to Skate Director & Figure Skating Coach Jun. 2024 – Present

- Assisted in managing a Learn to Skate program serving **40+ children** and provided skating instruction and choreography alongside world- and Olympic-level coaches.

Co-Founder, Ysari Digital Jan. 2023 – Sep. 2025
Web development and digital services

- Developed websites and AI-powered tools for more than a dozen small businesses and managed projects from client consultation to deployment and maintenance.

Former Team USA Figure Skater
Peak world ranking in the top 60; junior-level national medalist.

President, Detroit Skating Club Athletes Committee 2021–2023
Organized volunteer activities, community events, and fundraising.