Ye Htet

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Education

Washington University in Saint Louis (GPA: 3.8/4.0) **Aug 2021 – Present**
Ph.D. Candidate in Computer Science, advised by Dr. Jeremy Buhler *Saint Louis, MO*

- **Concentrations**: ML/AI, Computer Architecture, Systems
- **Coursework**: Machine Learning, Operating Systems, Computer Vision, Advanced Algorithms

Illinois College (GPA: 4.0/4.0) **Aug 2018 – May 2021**
B.Sc. in Computer Science *Jacksonville, IL*

Research Fields

Machine Learning Acceleration, Artificial Intelligence, Model Optimization, Model Compression, Dynamic Neural Networks, Pruning, Quantization, Simulation, High Performance Computing, Real-time Computing, Low-Power Design, Data Structure & Algorithms, Computer Architecture, Parallel Computing

Skills

Programming Languages: Python, C/C++, Bash, CUDA, OpenMP

Tools: PyTorch, Lightning, ONNX, sklearn, wandb, Numpy, Pandas, Matplotlib, Scipy, Git, Docker, Linux

Research Experience

Neural Networks for Resource-Constrained platform **Apr 2024 – Present**

- Applying model compression method such as **pruning** and **quantization** to enable the realistic deployment of the neural network models for **real-time** localization using a raspberry pi 3B+ test-bed in **C++**.
- Overseeing a summer research student in developing **slimmable** and **early-exit** networks, that can dynamically adapt its size in **real-time**.
- Organizing the investigation of accuracy versus resource consumption trade-offs in the use of **dynamic neural networks** within the **streaming** model.

Uncertainty Prediction Neural Networks for GRB localization **May 2023 – Apr 2024**

- Led the development of a full **deep learning** pipeline in **Python** for training and testing **physics-guided neural network models** for a scientific application (GRB localization) using **Pytorch Lightning** and **wandb**.
- Designed relevant features and target predictions to achieve significant improvement in localization accuracy.
- Mentored a master's student to use **RayTune** for the parallel distributed automatic **hyper-parameter tuning** of the model optimization space, resulting in smaller and accurate models

Data Analysis of GRB localization pipeline for ADAPT/APT **Aug 2021 – May 2023**

- Developed a **Python** library and tools that model and perform various data aggregations and transformations for efficient analysis of the output data generated by the pipeline.
- Investigated **data analysis** of a **simulation-based C/C++** computational pipeline using python libraries such as **numpy**, **pandas** and **matplotlib**, identifying the impacts of uncertainties in the sensor measurements leading to significant improvement in localization accuracy.
- Collaborated with several **team members** within a multi-institutional project for the development and analysis of a computational pipeline for gamma-ray bursts localization.

Projects

- **Quantifying different object detection architectures on ImageNet**: A comprehensive research for a class project on various object detection techniques surveying influential papers. Took several models pre-trained on COCO and performed transfer learning/fine-tuning to apply them to ImageNet images.
- **Bank Conflict Latency of Convolutions on GPUs**: A class research project to investigate the bank conflicts of convolution algorithms on the GPU and an asymptotic analysis of the corresponding latency on shared memory using the Discrete Memory Machine Model (DMM)

Publications

- **Ye Htet**, Marion Sudvarg, Jeremy Buhler, Roger D. Chamberlain, and James Buckley. "Localization of Gamma-ray Bursts in a Balloon-Borne Telescope". The First Workshop on Enabling Predictive Science with Optimization and Uncertainty Quantification in HPC (EPSOUQ), November 2023. Held in conjunction with SC 2023.
- **Ye Htet**, Marion Sudvarg, Jeremy Buhler, Roger D. Chamberlain, Wenlei Chen, James H. Buckley for the APT collaboration. "Prompt and Accurate GRB Source Localization Aboard the Advanced Particle Astrophysics Telescope (APT) and its Antarctic Demonstrator (ADAPT)". In Proc. of 38th International Cosmic Ray Conference – PoS(ICRC2023), volume 444, pages 956:1–956:9, July 2023.
- Marion Sudvarg, **Ye Htet**, Roger D. Chamberlain, Jeremy Buhler, Blake Bal, Corrado Altomare, Davide Serini, Mario Nicola Mazziotta, Leonardo Di Venere, Wenlei Chen, James H. Buckley for the APT collaboration. "Front-End Computational Modeling and Design for the Antarctic Demonstrator for the Advanced Particle-astrophysics Telescope". In Proc. of 38th International Cosmic Ray Conference – PoS(ICRC2023), volume 444, pages 764:1–764:9, July 2023.

Teaching Experience

Washington University in Saint Louis **Aug 2023 – May 2024**
Assistant in Instruction (Mentor: Dr. Roger Chamberlain) *Saint Louis, MO*

- Taught a graduate-level **high performance computing** systems course how to use a profiling and analysis tool (TAU) for the assignments.
- Held office hours for a graduate-level **computer architecture** class once every week to answer questions and review material taught in class.
- Developed students' understanding of fundamental concepts necessary to work on lab assignments and promoted a mastery of the practice problems as review for the exams.

Washington University in Saint Louis **Dec 2023 – May 2024**
Teaching Assistant - CSE 566S High Performance Computer Systems

Washington University in Saint Louis **Aug 2023 – Dec 2023**
Teaching Assistant - CSE 560M Computer Architecture

Other Experience

Speech and Debate, Illinois College **Jan 2019 – May 2021**

- Achieved first place for novice LD debate at Webster University tournament with 60 participants in the same tier.
- Achieved second place on a Public Speaking Showcase, presenting an informative speech on Artificial Intelligence to an audience of 130 people at Illinois College.
- Achieved top novice speaker award at forensics swing at McKendree University.

International Student Mentor, Illinois College **Aug 2019 – Dec 2019**

- Coached a team of 20 incoming international students together with the International Student Support Assistant.
- Conveyed student's opinions as the student representative at the monthly International Student Action Team chair meeting.
- Organized three campus social events or activities for students such as an outdoor grilling event attended by 30 international students.

Student Ambassador, Illinois College **May 2019 – Aug 2019**

- Empowered interested students to apply for the college on visitations and guided campus tours.
- Monitored event set up and implementation with the guest experience coordinator for 200 visitors on each event.

Honors & Awards

- **Thomas Smith Prize**: Honor Prize for first year excellence in Mathematics.
- **Levy, Ray & Shoup Scholarship**: Scholarship Award for excellence in Computer Science.
- **Alpha Lambda Delta**: National Honor Society to recognize the high academic achievement of first-year students.
- **Rammelkamp Honor Scholar**: Illinois College honor for highest cumulative grade point average.
- **Damsgaard-Carlson Debate Scholarship**: Scholarship Award for excellence in Debate.
- **George Gridley Wood Award**: Award for excellence in Speech and Debate.