

ASHWANTH KUPPUSAMY

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EDUCATION

Master of Science, Computer Science Sep. 2023 – Dec. 2025
Oregon State University Corvallis, Oregon

Bachelor of Technology, Computer Science Jul. 2019 – Jun. 2023
Amrita Vishwa Vidyapeetham Coimbatore, India

WORK EXPERIENCE

Machine Learning Engineer Oct. 2024 - Present
Microtec Inc Corvallis, Oregon

- Implemented CNN and transformer models for multi-class lumber defect segmentation for **7** client projects.
- Enhanced model robustness to lighting and sensor variations through channel-wise **custom augmentations**.
- Optimized GPU memory handling in training through profiling studies, achieving a **4x** increase in batch size.
- Reduced labeling efforts by **75%** while improving performance through strategic use of out-of-domain data.
- Engineered custom **CUDA** kernels to optimize model validation function complexity from **O(n)** to **O(1)**.
- Developed effective fine-tuning techniques to enhance feature transfer from source to target domains.
- Implemented image processing techniques to mitigate labelling inconsistencies across datasets.

Artificial Intelligence Intern Jun. 2024 – Sep. 2024
Microtec Inc Corvallis, Oregon

- Conducted **R&D** and successfully implemented state-of-the-art CNN architecture, bringing it to production.
- Created sampling strategies to address class imbalance, boosting IoU by **80%** for underrepresented classes.
- Developed specialized loss functions leading to a **90%** reduction in false positive instances of wood defects.
- Engineered multi-GPU training pipeline to achieve **4x** faster training speeds and reduced development time.
- Collaborated with senior engineers to develop **custom metrics** for better model selection and optimization.
- Optimized models for deployment using ONNX and TensorRT, enhancing inference speed and efficiency.

Graduate Research Assistant Mar. 2024 – Present
Oregon State University Corvallis, Oregon

- Developed automated data pipeline converting system logs to provenance graphs for security analysis.
- Trained graph neural network model to detect anomalies and malicious system activities in real-time.

Undergraduate Student Researcher (Embedded AI) Jan. 2023 – May. 2023
Amrita Vishwa Vidyapeetham Coimbatore, India

- Designed an algorithm of $O(n \cdot \log(n))$ complexity to distribute inference load among multiple AI accelerators.
- Developed an algorithm to determine computational complexity of deep learning models in IR format.

PROJECTS

Brain Tumor Segmentation Mar. 2024

- Implemented 2D/3D UNet, ResUNet and Attention-ResUNet in PyTorch for brain tumor segmentation.
- Developed a Mixture of Experts architecture for 2D Attention ResUNet and improved IOU score by **6%**.
- Achieved an IOU score of **0.8** with 3D ResUNet and **0.79** with Mixture of Experts 2D Attention-ResUNet.

ResNet-14 CIFAR-10 Classification Feb. 2024

- Developed and trained ResNet-14 model in PyTorch, achieving **83.54%** accuracy on CIFAR-10 classification.

SKILLS

Technical Skills: Python, C++, C, JavaScript, Java, SQL, Git, Docker, Azure, Jenkins, Scrum

Libraries/Frameworks: OpenCV, pyTorch, CUDA, NumPy, ONNX, tensorRT, FFCV, pandas, matplotlib, Scikit-learn, OpenGL, GLSL, NLTK, spacy, React.js, Node.js

Soft skills: Problem-solving, Analytical thinking, Communication, Self-motivation and Teamwork

PUBLICATIONS

"Inference at the Edge for Complex Deep Learning Applications with Multiple Models and Accelerators" 2023 14th (ICCCNT), Delhi, India, 2023, pp. 1-7, doi: 10.1109/ICCCNT56998.2023.10306363