Akash Haridas

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https://www.linkedin.com/in/akasharidas/
https://akasharidas.github.io

EDUCATION

University of Toronto Sep 2022 – Dec 2023 (expected)
MSc in Applied Computing (Computer Science) **GPA: 4.0 / 4.0**
Courses: Computational Imaging, Imitation Learning for Robotics, Natural Language Computing, Visual Computing Systems

Indian Institute of Technology Madras Jul 2022
BTech + MTech in Aerospace Engineering and Data Science **GPA: 9.26 / 10.00**
Courses: Computational Photography, Deep Learning, Systems Engineering for Deep Learning

EXPERIENCE

Advanced Micro Devices (AMD) May 2023 - Dec 2023
Applied Research Intern, Machine Learning and 3D Computer Vision

- Built an automatic system to produce high-fidelity animatable 3D human avatars from a consumer laptop webcam.
- Developed a novel method based on photorealistic GANs, 3D morphable models, landmark detection, face recognition embeddings and differentiable rendering in PyTorch3D.
- Achieved ~45% higher perceptual quality and ~25% better lighting symmetry compared to existing literature when applied to low-quality webcams, while also satisfying latency constraints for edge devices.
- Contributed a demo app to help AMD showcase the AI inference engine in the upcoming Ryzen mobile chips.

Indian Institute of Technology Madras Jul 2020 - Jul 2022
Student Researcher, Deep Learning for Fluid Mechanics and CFD

- Worked on developing fast and accurate AI algorithms for fluid simulations.
- Trained a ConvNet with physics-based components in JAX (framework) to correct errors in low-precision simulations.
- Published two first-author research papers and presented at a conference.
- Demonstrated improved computational efficiency and ~45% error reduction: [Paper]

unMazer.ai Summer 2020
Intern, Computer Vision and Product Development

- Event detection using a custom CNN+LSTM network and object detection using YOLOv4 in CCTV road footage.
- Built a procotoring tool to detect cheating in online exams using eye tracking models and OpenCV.
- Instrumental in building three AI-based minimum viable products (MVPs) during the company's initial phase.
- Blog post: [Leveraging AI to Reduce Road Fatalities]

SELECTED PROJECTS

LLM Learning Assistant: Long-Form Content Summarization and Q&A using Retrieval-Augmented Generation [Code]
Built an app to help you quickly comprehend the content of podcasts and lectures, capable of running locally via llama.cpp. Learned to work with Llama 2, LangChain, and vector databases to perform search and retrieval-augmented generation.

Deconvolution using ADMM with Diffusion Denoising Prior [Poster] [Paper] [Code] Fall 2022
Improved image deblurring under high Gaussian noise by using a pretrained diffusion model as a denoising prior.

DADAgger: Imitation Learning with Disagreement-Augmented Dataset Aggregation [Paper] [Code] Fall 2022
Improved data efficiency of the DAgger algorithm by estimating model uncertainty using ensemble variance. Resulted in a car-racing agent that learns successfully using 80% fewer queries to the expert.

Find more course projects and side-projects at https://akasharidas.github.io/projects/

SELECTED PUBLICATIONS

Akash Haridas, Nagabhushana Rao Vadlamani, Yuki Minamoto, Deep neural networks to correct sub-precision errors in CFD, Applications in Energy and Combustion Science, Volume 12, 2022

SKILLS

Programming: Python, C++, Julia, MATLAB, CUDA, HTML/CSS, LaTeX
Tools/Frameworks: PyTorch, LangChain, JAX, NumPy, Linux, OpenCV, Pandas, Scikit Learn, Google Cloud Platform, PySpark