

Akash Awasthi

EDUCATION

University of Houston

Houston, USA

Ph.D. in Electrical and Computer Engineering, GPA: 3.66/4.0

August 2021 – Present

- **Advisor:** Dr. Hien Van Nguyen
- **Research Interests:** Large Multimodal Models, Diffusion Processes, Vision-Language Pretraining, Scientific ML
- **Relevant Coursework:** Machine learning & Computer Vision, Advanced Linear Algebra, Optimization Theory, Stochastic Processes, Signal Detection and Estimation Theory, Bigdata Analytics & Applications, Advanced Neural Networks

Kalasalingam University

Tamil Nadu, India

*B.Tech (Honours) in Computer Science and Engineering, GPA: 9.5/10.0, **Gold Medalist***

August 2016 – June 2020

- **Relevant Coursework:** Data Structures & Algorithms, Object-Oriented Programming, Software Design, Computer Organization, Neural Networks and Fuzzy Logic, Data Mining, Database Systems, Data Science, Machine Learning for Science

RESEARCH EXPERIENCE

Argonne National Laboratory (US Department of Energy)

Lemont, Illinois

Machine Learning Researcher (Part time)

July 2024 – Present

- **Advisor:** Dr. Jiali Wang
- Develop a diffusion model for generating high-resolution climate data from numerical simulations.
- Incorporate observational data into the diffusion processes to enhance the accuracy and reliability of the generated climate data.

BAERI/NASA Ames Research Center

Moffett Field, CA

Data Scientist

May 2024 – August 2024

- **Advisor:** Dr. Taejin Park
- Map global forest edges and quantified their impacts on forest structure and aboveground biomass.
- Develop a temporal and spatially invariant machine learning model for semantic segmentation of NAIP data.

BAERI/NASA Ames Research Center

Moffett Field, CA

Data Scientist

May 2023 – Aug 2023

- **Advisor:** Dr. Ramakrishna Nemani
- Anomaly detection and localization on satellite videos using denoising diffusion models.

BAERI/NASA Ames Research Center

Moffett Field, CA

Data Scientist

May 2022 – Aug 2022

- **Advisor:** Dr. Ramakrishna Nemani
- Anomaly detection on satellite videos using denoising diffusion models.

University of Houston

Houston, TX

Graduate Research Assistant

Aug 2021 – Present

- **Advisor:** Dr. Hien Van Nguyen
- Multimodal learning on radiology datasets.
- Working with **MD Anderson Cancer center** to develop Human-AI collaborative systems in radiology to enhance the diagnostic performance and training.

Great Learning

Gurgaon, India

Data Scientist

Dec 2020 – July 2021

- Developed advanced analytics systems using predictive models to identify factors influencing business outcomes.
- Created updated learning materials and projects for the Data Science and Business Analytics program.

Indian Institute of Technology Kanpur (IIT Kanpur)

Student Research Associate

Kanpur, India

Jan 2020 – Sep 2020

- **Advisor:** Dr. Shivam Tripathi & Dr. Ashu Jain
- Developed data-driven models for downscaling climate data for regional analysis.

Rice University

Visiting Researcher (Remote)

Houston, TX

Jan 2020 – June 2020

- **Advisor:** Dr. Pedram Hasanzadeh
- Applied machine learning techniques to climate data analysis.

Indian Institute of Technology Gandhinagar (IIT Gandhinagar)

Research Intern

Gandhinagar, India

Feb 2019 – July 2019

- Generated super-resolution climate projections for Earth system models using deep learning.
- Developed Evaluation strategies for Statistical Downscaling using Deep Learning

Bhabha Atomic Research Center (BARC)

Project Trainee

Mumbai, India

Dec 2018 – Jan 2019

- **Advisor:** Vibhuti Duggal
- Worked on high-performance computing and parallel computing technologies such as CUDA and MPI.

PUBLICATIONS & PREPRINTS

- **Awasthi, Akash**, Vamsi, A.M., Duggal, V., Deepalakshmi, P. and Rao, S., 2019, March. 3D Visualization and Localization of Radiation Source in External Radiotherapy Using Inverse linear Boltzmann Transport Equation. In 2019 5th International Conference on Advanced Computing & Communication Systems (ICACCS) (pp. 123-128). IEEE. (Published, Best Paper Award, Top 1%)
- A. Madhu Vamsi, **Awasthi, Akash**, P. Deepalakshmi, P. Nagraj, P. Anup Raj. "IOT Based Autonomous Inventory Management for Warehouses." EAI International Conference on Big Data Innovation for Sustainable Cognitive Computing (BDCC 2018), 13 – 15 December 2018. EAI/Springer Innovations in Communication and Computing. Springer. (Published)
- **Awasthi, Akash**, A. Madhu Vamsi, P. Deepalakshmi, P. Nagraj. "Movable Barcode Scanning System Using IOT Smart Glass Technology." International Journal of Intelligent Enterprise. (Published)
- **Awasthi, Akash**, H.V. Nguyen, A. Michaelis, and R.R. Nemani. "Detecting Extreme Events in Streaming Satellite Data." In AGU Fall Meeting Abstracts (Vol. 2022, pp. IN56A-06). (Published)
- **Awasthi, Akash**. "Regional Analysis of ESM Models Using Bias Corrected Spatial Disaggregated Super-Resolution Convolutional Neural Networks." In 2023 10th International Conference on Signal Processing and Integrated Networks (SPIN) (pp. 1-6). IEEE. (Published)
- **Awasthi, Akash**, A.M. Vamsi, and P. Deepalakshmi. "Deep Learning-Based Mobile Robot for Warehouse Keeping." International Journal of Engineering and Advanced Technology (IJEAT), 9, pp. 153-156. (Published)
- **A. Awasthi**, S. Ahmad, B. Le and H. Nguyen, "Decoding Radiologists' Intentions: A Novel System for Accurate Region Identification in Chest X-Ray Image Analysis," 2024 IEEE International Symposium on Biomedical Imaging (ISBI), Athens, Greece, 2024, pp. 1-5, doi: 10.1109/ISBI56570.2024.10635322. (Published, Top 2%)
- **Awasthi, Akash**, S. Ly, J. Nizam, S. Zare, V. Mehta, S. Ahmed, K. Shah, R. Nemani, S. Prasad, and H. Van Nguyen. "Anomaly Detection in Satellite Videos Using Diffusion Models." arXiv preprint arXiv:2306.05376. (Accepted IEEE MMSP'24)
- **Awasthi, Akash**, Nizam, J., Zare, S., Ahmad, S., Montalvo, M.J., Varadarajan, N., Roysam, B. and Nguyen, H.V., 2023. Video Diffusion models for the apoptosis forecasting. bioRxiv, pp.2023-11. (Submitted IEEE BHI'24)
- **Awasthi, Akash**, Rizvi, S., M.J. Peláez, Z. Wang, V. Cristini, H. Van Nguyen, and P. Dogra. "Deep Learning-Derived Optimal Aviation Strategies to Control Pandemics." arXiv preprint arXiv:2210.10888. (Under Review Nature Scientific Reports)
- **Awasthi, Akash**, N. Le, Z. Deng, R. Agrawal, C. Wu, and H. Van Nguyen. "Multimodal Learning and Cognitive Processes in Radiology: MedGaze for Chest X-ray Scanpath Prediction. arXiv preprint arXiv:2407.00129." (Under Review RSNA: Artificial Intelligence Journal)
- **Awasthi, Akash**, Le, N., Deng, Z., Wu, C.C. and Van Nguyen, H., 2024. Enhancing Radiological Diagnosis: A Collaborative Approach Integrating AI and Human Expertise for Visual Miss Correction. arXiv preprint arXiv:2406.19686. (Under Review RSNA: Artificial Intelligence Journal)

HONORS & AWARDS

- Best Poster Finalist at IEEE ISBI 2024 (Top 2%)
- Recipient of the Student Travel Grant for IEEE ISBI 2024
- Graduate Research Fellowship, University of Houston (2021-Present)
- Awarded the Gold Medal for securing the top position in B.Tech at Kalasalingam University
- Offered Associate Position at Pricewaterhousecoopers (PwC India)
- Best Paper Award at the IEEE ICACCS 2019
- 1st Runner-Up in the Smart India Hackathon 2019, Department of Atomic Energy, Government of India
- Recipient of the IQAC Student Motivation Award for Research by Kalasalingam University
- Gold Medal in the NPTEL course "Programming in C++" by IIT Kharagpur (Top 1% All India)
- Silver Medal in the NPTEL course "IoT" by IIT Kharagpur (Top 5% All India)

PROFESSIONAL SERVICES

- Reviewer for IEEE Transactions on Neural Networks and Learning Systems
- Reviewer for IEEE Access
- Reviewer for MICCAI 2024
- Reviewer for ACCV 2024
- Scientific Committee Board Member for the International Olympiad on Artificial Intelligence (IOAI 2024) [Link to Team Page](#)

INVITED TALKS

- August 2024: Refined Urban Mapping: Integrating LIDAR Data and Aerial Imagery for Enhanced Semantic Segmentation of Trees and Buildings, NEX Group, NASA Ames Research Center, California
- Summer 2023: Introduction to AI/ML and their applications in detecting extreme weather events in satellite imagery, HBTU Kanpur, India
- Summer 2023: AI in NASA, M.Kumarasamy College of Engineering, Karur, India

TEACHING EXPERIENCE

Summer 2024: ECE 5397/6397 Machine Learning, Teaching Assistant

STUDENTS GUIDED

Syed Asad Rizvi - Now Ph.D. student at Yale University

Safwan Ahmad - Now Software Intern at Microsoft Redmond

Bryant Le - Now Software Engineer at GEICO

Videet Mehta - Now CS Undergrad at MIT

Keshav Shah - Now Software Intern at Visa