

# KAUSTUBH HARAPANAHALLI

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## EDUCATION

**Doctor of Philosophy in Computer Science** Aug '25 - Present  
Arizona State University, Tempe, AZ

**Master's of Science in Computer Science** Aug '22 - Aug '25  
Arizona State University, Tempe, AZ  
3.75 GPA

## SKILLS

**Programming:** Python, C++, JavaScript, SQL

**Tools:** PyTorch, TensorFlow, Docker, Git, AWS, ReactJS, PostgreSQL, Django, REST, Nginx

## PUBLICATIONS

Sai Shashank Peddiraju, **Kaustubh Harapanahalli**, Edward Andert, and Aviral Shrivastava, "*IncidentNet: Traffic Incident Detection, Localization, and Severity Estimation with Sparse Sensing*" at 2024 IEEE 27th International Conference on Intelligent Transportation Systems (ITSC), 2024. [\[link\]](#)

## EXPERIENCE

**Artificial Intelligence and Machine Learning Intern** May '25 - Aug '25  
**AION Robotics, Remote**

- Generated high-density camera datasets and built an experimentation playground to benchmark and fine-tune real-time perception models.
- Integrated workflows and comparative performance analysis into AION's AI/ML pipeline to improve model reproducibility and accelerate simulation.

**Artificial Intelligence and Computer Vision Intern** Jun '23 - Jan '24  
**Siemens Technology, Remote**

- Developed a **Patch Augmentation** library enhancing anomaly detection in computer vision models where the defect size is minuscule compared to image size, utilizing randomized and bounding-box aware patch extraction.
- Implemented and analyzed the impact of patch augmentation on model generalization, significantly improving detection accuracies with a **99.67%** training accuracy in image classification using ResNet18 and a **99.23%** mAP in object detection with YOLOv5.

**Research Engineer** Aug '19 - Jun '22  
**Siemens Technology, Bengaluru, India**

- Formulated and developed a framework for *rapid prototyping and developing computer vision solutions for industrial AI solutions*. The framework reduced more than **40%** of manual effort on developing prototypes.
- Developed an automation tool for processing and generating global coordinates for railway use-cases using Airflow, resulting in **75%-time reduction**, manual intervention down from **8 to 3 days**.

## PROJECTS

**Function Integration of Image Analysis Techniques for Colonoscopy Imaging Analysis** Spring '23  
Developed a multi-task model integrating image classification, object detection, and instance segmentation with a ResNet-50 backbone. On a colonoscopy dataset, the integrated model achieved 99.8% F1-score, 0.879 MAE loss, and 86.2% IoU—surpassing the baseline performance of 98.3% F1, 0.973 MAE, and 78.9% IoU.

**Comparative study between UNet and UNet++ model architectures for Medical Imaging Segmentation** Fall '22  
Trained UNet and UNet++ model architectures for Pneumothorax and Polyp instance segmentation tasks. The IoU for Polyp Segmentation was **68.81%** and **75.27%** for UNet and UNet++, and for Pneumothorax was **67.78%** and **72.1%**.

## LEADERSHIP AND OUTREACH

**Vice President, Technical:** The AI Society at ASU, Tempe, AZ Jun '25 - Present

**Technical Director:** The AI Society at ASU, Tempe, AZ Jan '25 - May '25