AAYUSH JUNG RANA

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Experience

- **Research Assistant** - Center for Research in Computer Vision (CRCV)
  University of Central Florida (UCF)
  (08/2017 - 07/2023 Expected)
- **Research Intern** - Qualcomm Technologies
  (05/2022 - 08/2022)
- **Research Intern** - Center for Vision Technologies (CVT)
  Stanford Research Institute (SRI) International
  (05/2020 - 08/2020)
- **Research Assistant** - Vision and Graphics Lab
  CSIM, Asian Institute of Technology (AIT)
  (06/2015 – 07/2017)
- **Software Intern** – IT Department, Western Digital Thailand
  (05/2015 – 08/2015)
- **Engineer Intern** – Network Technology Laboratory, Thailand
  (06/2013 – 09/2013)

Research Interests

- Computer Vision
- Machine Learning
- Video Understanding
- Action Detection
- Image Processing
- Robotics

Education

- **Doctor of Philosophy (PhD) in Computer Science** *(08/2017 - 07/2023 Expected)*
  Center for Research in Computer Vision (CRCV), University of Central Florida
- **B.S.E. in Information and Communication Technology** *(09/2011 – 05/2015)*
  Asian Institute of Technology

Publications

- **Aayush Jung Rana**, Yogesh Singh Rawat; ***Are all Frames Equal? Active Sparse Learning for Video Action Detection***; Advances in Neural Information Processing Systems (**NeurIPS**) 2022

- **Aayush Jung Rana**, Yogesh Singh Rawat; ***We don't Need Thousand Proposals: Single Shot Actor-Action Detection in Videos***; IEEE/CVF Winter Conference on Applications of Computer Vision (**WACV**) 2021

- Naman Biyani, **Aayush Jung Rana**, Shruti Vyas, Yogesh Singh Rawat; ***LARNet: Latent Action Representation for Human Action Synthesis***; British Machine Vision Conference (**BMVC**) 2021

- Mamshad Rizve, Ugur Demir, Praveen Tirupattur, **Aayush Jung Rana**, Kevin Duarte, Ishan Dave, Yogesh Singh Rawat, and Mubarak Shah; ***Gabriella: An Online System for Real-Time Activity Detection in Untrimmed Security Videos***; IEEE International Conference on Pattern Recognition (**ICPR**) 2020 *(Best Paper Award)*

- **Aayush Jung Rana**, Yogesh Singh Rawat; ***SSA2D: Single Shot Actor-Action Detection in Videos***; Student Abstract at the Thirty-Fifth **AAAI** Conference, 2021

Projects and Research Experience

- **Video semantic segmentation with temporal consistency (Qualcomm)**
  Improve low latency video semantic segmentation with temporally consistent predictions.

- **Low cost annotation for video action detection *(CRCV, UCF)***
  Use active learning to identify high utility regions for annotation to achieve high precision video action detection, addressing issues with sparse annotation based deep learning.

- **Large scale object detection using LiDAR *(SRI International)***
  Use LiDAR data from high altitude aerial vehicles to perform 3D object detection over large areas using deep learning. Developed models to run fast inference over large areas with higher precision.

- **Video activity localization and classification *(CRCV, UCF)***
  Perform localization and classification of actors and action from an untrimmed video sequence on a multi-label and multi-class dataset using deep learning. Developed under IARPA funded program with 1st place in ActEV SDL 2020 challenge and 2nd place in TRECVid 2019 challenge.

- **End-to-end video action localization and classification *(CRCV, UCF)***
  Deep learning based real-time end-to-end action localization and classification method. Achieves state-of-the-art results with significantly reduced inference time.

- **Real-time Farm Mapping *(VGL, AIT)***
  SLAM based 3D environment mapping system to measure position and thickness of eucalyptus trees.

- **Sugarcane leaf disease and insect detection *(VGL, AIT)***
  Image processing (superpixel segmentation, edge detection), machine learning, and mathematical modeling based system development to detect and classify different insects and leaf diseases.

- **Driver monitoring system with real-time feed *(AIT Thesis)***
  Lane detection, analysis, and database management frontend and backend system implemented with real-time server interaction using OpenCV (C++) and Ruby on Rails

- **Automatic drone control *(TAMECH 2013 Automated Drone Competition)***
  Developed drone control system using Robot Operating System and OpenCV in C++. Placed in top ten in the 2013 Thai Aerial Mission Engineering Challenge

Skills

Programming: Python, C++, C, Java, Matlab, C#, SQL
Libraries: Deep learning (Pytorch, Tensorflow, Keras), OpenCV, ROS
Embedded systems: ARM Cortex, Raspberry Pi, Arduino, Udoo

Honors and Awards

- UCF ORCGS Fellowship
- AIT Fellowship
- AIT Dean's List

Workshops

- TinyAction Challenge *(**CVPR Workshop**, 2022)* - Organizer
- Robustness in Sequential Data *(**CVPR Workshop**, 2022)* - Program Committee
- TinyAction Challenge *(**CVPR Workshop**, 2021)* - Organizer
- Multi-modal Video Understanding in a Noisy Environment *(**ACM MM Grand Challenge**, 2021)* - Organizer
- Trustworthy AI for Multimedia Computing *(**ACM MM Workshop**, 2021)* - Program Committee

References

Dr. Yogesh Singh Rawat
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Dr. Mubarak Shah
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