AAYUSH RANA

aayushjr@knights.ucf.edu
407-232-3804

Experience

- **Research Intern** - Center for Vision Technologies (CVT)
  Stanford Research Institute (SRI) International
  (05/2020 - 08/2020)
- **Research Assistant** - Center for Research in Computer Vision (CRCV)
  University of Central Florida (UCF)
  (08/2017 - present)
- **Research Assistant** - Vision and Graphics Lab
  CSIM, Asian Institute of Technology (AIT)
  (06/2015 – 07/2017)
- **Internship** – IT Department, Western Digital Thailand
  (05/2015 – 08/2015)
- **Internship** – Network Technology Laboratory, NECTEC 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
  Center for Research in Computer Vision (CRCV)
  (08/2017 - present) **University of Central Florida**
- B.S.E. in Information and Communication Technology
  (09/2011 – 05/2015) **Asian Institute of Technology**

Honors and Awards

- UCF ORC Doctoral Fellowship
- AIT Fellowship
- AIT Dean's List

Publications

- **We don't Need Thousand Proposals: Single Shot Actor-Action Detection in Videos**
  IEEE Winter Conference on Applications of Computer Vision (WACV) 2021
- **LARNet: Latent Action Representation for Human Action Synthesis**
  British Machine Vision Conference (BMVC) 2021
- **Gabriella: An Online System for Real-Time Activity Detection in Untrimmed Security Videos**
  IEEE International Conference on Pattern Recognition (ICPR) 2020 *(Best Paper Award)*
- **SSA2D: Single Shot Actor-Action Detection in Videos**
  AAAI-21 Student Abstract and Poster Program at the Thirty-Fifth AAAI Conference, 2021

Skills

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

Projects and Research Experience

- **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**

- **Large scale object segmentation using LiDAR *(SRI International)***
  Use LiDAR data from high altitude aerial vehicles to perform object segmentation over large areas.

- **Video activity localization and classification *(CRCV, UCF)***
  Perform localization and classification of actors and action from a given untrimmed video sequence on a multi-label and multi-class dataset using deep learning. Developed under IARPA funded program and used on DIVA and A2D datasets. 1st place in ActEV SDL 2020 challenge and 2nd place in TRECVid 2019 challenge.

- **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.

- **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 real-time 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

Reference

Dr. Mubarak Shah
Trustee Chair Professor
Director, Center for Research in Computer Vision (CRCV)
University of Central Florida
Phone: 407-823-4952
Email: shah@crcv.ucf.edu

Dr. Yogesh Singh Rawat
Assistant Professor
Center for Research in Computer Vision (CRCV)
University of Central Florida
Phone: 407-823-6495
Email: yogesh@crcv.ucf.edu