

# Vivek ROY

✉ [vivek@vivekroy.com](mailto:vivek@vivekroy.com) [github.com/thezealousfool](https://github.com/thezealousfool) <https://vivekroy.com>  
☎ +1 (412) 708-3305 [in linkedin.com/in/thezealousfool](https://www.linkedin.com/in/thezealousfool) 📍 Pittsburgh PA

## EDUCATION

---

### Carnegie Mellon University

*Master of Science in Robotics and Machine Learning*  
Advisor: Prof. Kris Kitani. GPA: 4.0/4.0

Pittsburgh PA  
Sep 2020 – May 2022

### Jadavpur University

*Bachelor of Computer Science and Engineering*  
GPA: 8.71/10 Rank: 7/75

Kolkata, India  
July 2015 - May 2019

## WORK EXPERIENCE

---

### Graduate Research Assistant

*Carnegie Mellon University*

Sep 2020 – May 2022

- Multi-camera calibration and ReID assisted human tracking  
Advised by *Prof. Kris Kitani*
  - Bundle adjustment based multi-camera calibration in a construction site.
  - ReID for tracking workers across multiple cameras.
- Estimating 3D Camera Pose from 2D Pedestrian Trajectories  
Advised by *Prof. Kris Kitani*
  - Camera re-calibration under the assumption that pedestrian trajectories on a flat 3D plane.
- Few-Shot Learning with Intra-Class Knowledge Transfer  
Advised by *Prof. Yu-Xiong Wang*
  - Generative model to hallucinate samples belonging to few-shot class
  - Statistics learnt from many-shot classes using a non-parametric model to seed the generator.
- On device deep learning based indoor localization  
Advised by *Prof. Kris Kitani*
  - State estimation using commodity smartphone sensors.
  - Bluetooth Low Energy (BLE) and Inertial Measurement Unit (IMU) sensor fusion.
  - Floor plan encoded map information as a prior to particle filter.

### Research Scholar

*Carnegie Mellon University*

June 2019 – Aug 2020

- Multitask Learning combining Object Detection, Segmentation, Tracking and Forecasting  
Advised by *Prof. Martial Hebert*
  - Formulated a temporally consistent neural network by extending MaskRCNN.
  - Tracking is done by associating segmentation masks over time.
  - Motion forecasting module to learn a motion model of the object and further improve detection and tracking.
- Learning to monitor, detect, track and characterize Radioactive and Nuclear threat in city traffic.  
*US Department of Homeland Security*
  - Object detection and classification used to detect and classify vehicles into different vehicle classes.
  - Object tracking is used to estimate the speed of the vehicles.
- Android and iOS apps for Indoor Navigation using Deep Learning  
Advised by *Prof. Kris Kitani*
  - On device deep learning models for state estimation.
  - Path planning and turn-by-turn navigation as an assistive technology for visually impaired people navigate.

## Research Intern

June 2018 – Aug 2018

Carnegie Mellon University

- Visual Object Tracking using Optical Flow  
Advised by *Prof. Martial Hebert*
  - Tracking hand-held objects more robustly even in scenarios of partial occlusion by the holding hand.
  - Leveraged geometrical information captured by the Brox method for computing dense optical flow for tracking.

## Graduate Teaching Assistant

Sep 2021 – Dec 2021

Carnegie Mellon University

- Introduction to Computer Vision by Prof. Kris Kitani and Prof. Ioannis Gkioulekas

## Summer Intern

June 2017 – Aug 2017

Google Summer of Code

- Developed 3D Hardware accelerated graphics drivers for Haiku OS
- Learn from the graphics pipeline in the Linux kernel and Mesa and port it to Haiku OS.

## PUBLICATIONS

---

Learnable Spatio-Temporal Map Embeddings for Deep Inertial Localization IROS 2022 (submitted)  
Dennis Melamed, **Vivek Roy**, Karnik Ram, Kris Kitani

Few-Shot Learning with Intra-Class Knowledge Transfer arXiv [PDF]  
**Vivek Roy**, Yan Xu, Yu-Xiong Wang, Kris Kitani, Ruslan Salakhutdinov, Martial Hebert

Estimating 3D Camera Pose from 2D Pedestrian Trajectories WACV 2020 [PDF]  
Yan Xu, **Vivek Roy**, Kris Kitani


DeepBLE: Generalizing RSSI-based Localization Across Different Devices arXiv [PDF]  
Harsh Agarwal, Navyata Sanghvi, **Vivek Roy**, Kris Kitani


Multitask Learning combining detection, segmentation, tracking and forecasting RISS 2019 [PDF]  
**Vivek Roy**, Luis Navarro, Martial Hebert


Using Convolutional Neural Networks on Optical Flow for Visual Object Tracking RISS 2018 [PDF]  
**Vivek Roy**, David Russell, Satyaki Chakraborty, Martial Hebert

## ACHIEVEMENTS

---

**National Talent Search Examination** Govt. of India  
Undergraduate scholarship offered by the Govt. of India to the top 1000 students in the country. 

**Regional Mathematics Olympiad (AMD 10/12)** 2011 – 2013  
Same as the AMC 10/12 in United states. One of 35 students in the state for 3 years. 

**Zonal Informatics Olympiad (USACO Bronze)** 2013  
Same as the USACO Bronze level in United states. One of 40 students in the state. 

## LEADERSHIP

---

**Team lead – Ego4D dataset license server** Sep 2021 – Feb 2022  
▪ Worked with Common Visual Data Foundation (CVDF) and Ego4D consortium to build the Ego4D license server.

**Systems Administrator – KLab, Carnegie Mellon University** June 2020 – May 2022  
▪ Secure and maintain multiple Linux servers. Secure and maintain multiple Linux servers.

**Summer Research Mentor – Carnegie Mellon University** June 2021 – Aug 2021  
▪ Mentored a summer research intern at CMU under Prof. Kris Kitani.