Ashank **Behara**

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Education

University of Illinois at Urbana-Champaign *August 2018 - May 2022*

Computer Science and Mechanical Engineering, Bachelor's

Robotics, Autonomous Systems, Deep Learning, Computer Architecture, Data Structures and Algorithms, Linear Algebra, Dynamics, Solid Mechanics, Statics, Computer Aided Design, Differential Equations, Fluid Dynamics, Thermodynamics, Discrete Structures

Experience

Human Centered Autonomy Lab | University of Illinois at Urbana-Champaign *August 2020 - Present*

Robotics Researcher - Autonomous Vehicles *Urbana, Illinois*

- Implementing and training Velodyne LiDAR based 3D object detection model in Pytorch for electric and autonomous car
- Streaming point cloud and camera data from the GEM car using ROS and testing car functionality in simulation with Gazebo and Rviz
- Aided in rewriting the camera based birds-eye-view lane detection pipeline using Python and OpenCV

3M *May 2020 - August 2020*

Research Intern - Computer Vision *Maplewood, Minnesota*

- Custom trained and implemented YOLO R-CNN model with a DarkNet backbone for 2D object detection and localization of low visibility bodies
- Leveraged OpenCV in Python for curvature calculation of specular and reflective surfaces and deployed on multi-axis robotic arm
- Built multi-class image classifier using a custom built CNN in Tensorflow and Keras and deployed on NVIDIA Jetson-Nano for IoT solution

Hack4Impact *September 2019 - Present*

Software Developer *Urbana, Illinois*

- Full stack development in tech for social good 501(c)(3) shipping robust software solutions to other nonprofits across the world
- Work vertically in tech stack in in a team of 8 developers and designers with frameworks such as React.js, Node.Js, Flask, MongoDB, and Next.js
- Built and shipped interactive project sharing platform and built proof of concept ride sharing web application for UIUC students

Caesar Research Group | University of Illinois at Urbana-Champaign *March 2020 - August 2020*

IoT Researcher *Urbana, Illinois*

- Working on frontend infrastructure team for large scale IoT Virtual Circuit Emulator tool available for all UIUC engineering courses
- Modeling virtual user-constructed hardware components as Immutable.js objects and writing unit tests for translation to JSON
- Developing multiple displays with React (Typescript) and Konva.js for web frontend to visualize circuits and dynamically edit circuit properties

RAAD Systems *June 2019 - August 2019*

Robotics Intern *San Jose, California*

- Designed and modeled 6-axis robot and mounting interface for mobile robot using Autodesk Inventor
- Performed inertial and torque analysis for motor selection and functionality testing for kinematics analysis using MATLAB
- Gained knowledge in good industry practices to robustify load bearing mechanical systems and proper design procedures

Disability, Participation, and Quality of Life Lab | University of Illinois at Urbana-Champaign *June 2019 - December 2019*

Research Assistant *Urbana, Illinois*

- Leveraged Python and MATLAB for wheelchair fall detection using a large sensor suite consisting of accelerometers, gyroscopes, and force plates
- Used SciKit Learn to implement polynomial regression machine learning model and used Vicon motion capture system to validate predictions

Kod*Lab | University of Pennsylvania *June 2017 - August 2017*

Robotics Researcher *Philadelphia, PA*

- Performed motion analysis of hexapedal and aerial robots using Python and data extracted from the Vicon motion capture system
- Wrote Vicon user guide for the entire lab, assembled various robots, such as Minitaur, and and wrote clustering script for data classification

Projects

Vision-based PPE Validation

https://github.com/abehara2/GotMask

C++ and Python implementations of real time object detection of face-masked and gloved medical personnel using OpenCV. Built, trained, and optimized CNN to 96.3% accuracy using Tensorflow and Keras. Deployed on Raspberry Pi 4 with external camera and i2c LCD display.

Autonomous Early-Collision Detection System

https://github.com/abehara2/RideSafe

Implemented Single Shot Detector in Python and OpenCV for detection and localization of pedestrians, vehicles, and road signs. Built depth perception system with a single camera and am experimenting with semantic instance segmentation of depth cloud data.

Skills

Development: C++, Java, Python, Tensorflow, Keras, OpenCV, Pytorch, ROS, Gazebo, Javascript, MATLAB, React, Node, MongoDB, Verilog, MIPS
Modeling and Analysis: Autdesk Fusion 360, CREO Parametric, Solidworks, Autodesk Inventor, APriori

Extra Curriculars and Awards

Co-founder and VP of Neurotech @ UIUC: Machine learning and technical consulting for Fortune 500 companies
1st Place @ Autodesk BioEngineering Designathon: Designed knee injury simulator for medical students
Honorable Mention @ Health Make-a-Thon: Designed wearable for chronic illness detection for elderly patients in rural areas
Illinois Club Tennis Team: Opportunity to play a sport I love at a high level!