

ASHANK BEHARA

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EDUCATION

University of Illinois at Urbana-Champaign

Mechanical Engineering and Computer Science

Concentration in Robotics

August 2018 - May 2022

Key Coursework

Robotics, Autonomous Systems, Deep Learning, Computer Architecture, Data Structures and Algorithms, Linear Algebra, Circuits/Electronics, Dynamics, Solid Mechanics, Statics, CAD, Differential Equations, Fluid Dynamics, Thermodynamics, Discrete Structures

WORK EXPERIENCE — SEE MORE

Center for Autonomy @ UIUC

Undergraduate Perception Researcher

August 2020 - Present

- Building deep learning and LiDAR based 3D object detection and localization model for autonomous and electric vehicle using OpenCV and Pytorch
- Researching novel sensor fusion models and algorithms for 3D object detection and semantic segmentation for camera and LiDAR based perception systems
- Deploying perception model and streaming point cloud and camera data from different hardware components and sensors across the Polaris GEM car using ROS Kinetic and testing in simulation through Gazebo

3M

R&D Computer Vision Intern

May 2020 - August 2020

- Real-time image processing on live video of highly reflective, specular, and complex surfaces of vehicles to support robotic vision and perception
- Custom trained and implemented YOLO based R-CNN model with a DarkNet backbone for real-time object detection and localization platform
- Leveraged OpenCV to extract specific features and perform computations used to provide quantifiable metrics from images and improved accuracy of calculations using a multiple polynomial regression machine learning model trained and built using SciKit-Learn
- Deployed object detection model and image processing code on multi-axis robotic arm for detection and localization of low visibility bodies
- Built image classifier using a custom built CNN written with Tensorflow and Keras and deployed on NVIDIA Jetson-Nano for IoT solution

Caesar Research Group @ UIUC

Undergraduate IoT Researcher

March 2020 - August 2020

- Working on frontend infrastructure and VR backend teams 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 component properties

Hack4Impact

Software Developer

September 2019 - Present

- Full stack development in tech for social good 501(c)(3) shipping robust software solutions to other nonprofits across the world
- Worked in a wide variety of areas such as auth infrastructure, backend REST API development in Node.js and Flask, integration of external APIs, frontend development in React and Next.js, and SQL and MongoDB database design
- Built and shipped interactive project sharing platform and built frontend for proof of concept ride sharing web application for UIUC students

RAAD Systems

Mechanical Design Engineering Intern

May 2019 - August 2019

- 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 and implemented a D-H matrix for kinematics analysis
- Gained knowledge in good industry practices to robustify load bearing parts of mechanical systems and proper design procedures for geometric tolerancing

DPQL Lab @ UIUC

Undergraduate Research Assistant

June 2019 - December 2019

- Wrote multiple MatLab and Python scripts to process, analyze, and correlate data from accelerometers, Vicon motion capture system, and force plates
- Applied a multiple logistic regression model using SciKit-Learn in Python to determine when wheelchair falls might occur based on generated data

Grasp Lab @ UPenn

Robotics Research Intern

June 2017 - August 2017

PROJECTS

Vision-based PPE Validation — github.com/abehara2/GotMask

C++ and Python implementations of real time object detection of face-masked and gloved medical personnel using image segmentation and HAAR classifiers with OpenCV. Built, trained, and optimized CNN to 96.3% accuracy using Tensorflow and Keras for glove identification. Deployed on Raspberry Pi 4.

Autonomous Early-Collision Detection System — github.com/abehara2/RideSafe

Implemented Single Shot Detector in Python and OpenCV for classification and localization of pedestrians, vehicles, and road signs. Built depth perception system to accurately compute distance to a detected object and see if an object is within a set distance to the mounted camera.

Fatemaker — github.com/hack4impact-uiuc/kids-save-ocean

Sustainability project accelerator aimed at motivating children to make a change in their communities and empower other children across the world. Full stack web application developed using Next, MongoDB Node.js, Fuse.js, and Express.js. Worked vertically in tech stack on a team with other software developers and product designers to build the best possible product.

SKILLS

Software & Tools: C++, Python, Java, Javascript, Matlab, OpenCV, Tensorflow, Keras, ROS, Gazebo, React, Node.js, MongoDB, SciKit-Learn
Modeling and Analysis: CREO Parametric, Solidworks, Inventor, Fusion 360, APriori, Cura, Vicon

EXTRA-CIRRICULARS AND AWARDS

Co-founder and VP of Neurotech @ UIUC: Machine learning and technical consulting for Fortune 500 companies

First Place @ Autodesk 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