Bhargav Chandaka

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Education

University of Illinois at Urbana-Champaign *August 2023 - May 2025 (expected)*
Master of Science in Computer Science (Incoming)

University of Illinois at Urbana-Champaign *August 2019 - December 2022*
Bachelor of Science in Mathematics & Computer Science GPA: 3.85/4.0
Selected Coursework: AI for Robotic Manipulation, Machine Vision, IOT, Systems Programming

Industry Experience

MIT Lincoln Laboratory Lexington, MA
Embedded Software Engineer *Feb 2023 - Current*

- Refining time series ML models for realtime biological aerosol threat detection on edge devices
- Automating and defining system-level tests for an internal UAV navigation/target tracking framework

Johnson & Johnson Medtech Redwood City, CA
Robotics Software Engineer Intern *May 2022 - December 2022*

- Improved user workflows after a system restart for the Monarch flexible surgical robot platform
- Implemented a production-level feature with C++/CMake and tested in simulation and on hardware

Earthsense (Agtech Startup) Champaign, IL
Computer Vision Intern *January 2022 - May 2022*

- Worked with algorithms to analyze crops using video data gathered by autonomous mobile robots
- Explored optimizing PyTorch/Tensorflow Mask-RCNN instance segmentation models for faster inference on edge devices(Raspberry Pi/Intel Compute Stick) using Onnx, TFLite, d2Go, and tensorRT

Merck Kenilworth, NJ(remote)
Devops/ML Intern (Process Automation Platform) *June 2021 - December 2021*

- Developed and documented an Azure CICD pipeline to deploy AWS resources with infrastructure-as-code
- Created and deployed a document classification model as an API using PyTorch and AWS Sagemaker

John Deere Champaign, IL
Software Engineer Intern (Robotics R&D) *February 2020 - May 2021*

- Integrated a path tracking controller into an autonomous construction vehicle with Matlab/C
- Created a real-time web dashboard to remotely supervise multiple autonomous golf mowers

Research Experience

Autonomous Vehicle Research (Project Page Link) Champaign, IL
Undergrad Research Assistant (Professor Shenlong Wang) *January 2022-Current*

- Combining photo-realistic video simulation with a physical test track environment to better test self-driving systems in safety-critical scenarios (Sim-on-Wheels)
- Performing lidar/camera sensor calibration, pointcloud mapping, modular autonomy, waypoint tracking, and realtime 3D object insertion with ROS, opencv, and moderngl
- Submitted a paper(as first co-author) for the RAL journal in collaboration with three PhD students

Surgical Robot Research Champaign, IL
Undergrad Research Assistant (Professor Kris Hauser) *August 2020-December 2020*

- Conducted an independent study on robotic eye surgery using an industrial robot arm and OCT imaging
- Implemented a robust kalman filter to improve the accuracy of image-based needle and cornea tracking

Awards and Honours

Honorable Mention at the UIUC Undergrad Research Symposium Poster Session *May 2022*
Poster Title: Realistic Video Simulation for Testing Real Time Self-Driving Systems
Research Mentor: Asst. Prof. Shenlong Wang, Department of Computer Science

Multiple Awards worth $1250 at the Cozad New Venture Startup Challenge *May 2022*

Best use of echoAR Prize at the GarudaHacks Hackathon *August 2020*

AIM HIGH Grant merit-based scholarship worth $2500 per semester from UIUC August 2019

Technical Skills

Strong Experience with: Python, C++, Java, ROS, OpenCV, PyTorch, Linux, Git, AWS, Azure Devops
Some Experience with: Matlab/Simulink, ReactJS, SQL, Docker, 3D printing, Autodesk Fusion 360

Leadership & Clubs

Illinois Robotics in Space Champaign, IL
Autonomous Team Lead *September 2019-May 2022*

- Led a team of 12 to program an autonomous lunar rover for the Nasa Robot Mining Competition
- Improved team project management by creating an internal wiki for documentation, an agile-style board of tickets to organize work, and clearly discussing updates/next steps each week
- Utilized the Robot Operating System (ROS2) to interface with an IMU, Intel Realsense, arduino, etc.
- Implemented Aruco marker based localization, a ground detection algorithm, and created a custom Gazebo simulation model and environment for early robot testing

Voca (Independent Startup Venture) Champaign, IL
Engineering Lead *September 2021-May 2022*

- Participated in an early startup project as part of the AxisMed pre-incubator for innovation in healthcare
- Creating a mobile+web app platform that tracks more objective metrics to better treat vocal disorders
- Pitched to investors at the Cozad New Venture Challenge

Personal Projects

Sensor Fusion for Pose Estimation during GPS Cutout (GitHub Repo) *May 2022*

- Applied sensor fusion of GPS, Camera, and IMU data to better estimate a vehicle's position during GPS cutouts for my Machine Vision Final Project
- Implemented a stereo Visual-Inertial Odometry algorithm from scratch and leveraged a kalman filter to shift the position estimate between VIO and GPS outputs based on the noise in each individual estimate
- Ran experiments with the KITTI dataset and simulated noisy GPS cutouts in various test cases

Chess Plan (Demo Video Link) *May 2021*

- Taught 7DOF robot arms to play chess in simulation as my final project in AI for Robotic Manipulation
- Trained a Resnet-152 model to predict chess piece locations based on an image of the board
- Performed grasp analysis to create a database of feasible grasps to grip each piece with and constructed motion plans around obstacles to autonomously pick and place pieces to execute the desired chess move

Math AR App (Project Page Link) *August 2020*

- Built an Android app in 36 hours with Flutter and Unity to teach young students math by visualizing 3D math tools(unit blocks, number lines, etc.) in Augmented Reality for the GarudaHack Hackathon

Volunteering

FIRST Robotics/IRIS Outreach *September 2019-Current*

- Volunteering at FLL, FTC, and FRC events as a state-level referee, project judge, and other capacities
- Showcased my team's lunar rover robot, sensors, and club information in interactive booths/presentations at many local stem fairs, high schools, and other events
- Taught an introductory 1 hour course on robotics development for prospective freshman students