

Ashwin Bhat

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Education

Johns Hopkins University

Baltimore, MD

BACHELOR OF SCIENCE IN COMPUTER ENGINEERING

Aug. 2014 - May 2018

- IEEE (Vice President of Student Chapter), Robotics Club, Association for Computing Machinery
- **Selected Coursework:** Computer Vision, Algorithms for Sensor-Based Robotics, FPGA Lab, Electronics Design, Robot Sensors and Actuators

Experience

Medly Pharmacy

New York, NY

SOFTWARE ENGINEER II (PROMOTED OCT. 2021), SOFTWARE ENGINEER I

Oct. 2020 - Present

- Full-stack development creating internal products for Medly's patient experience team (Typescript, React, Redux, AWS, Postgres).
- Developing new pharmacy tools to streamline pharmacy operations and replace legacy third party software.
- Planning architecture and databases for backend services (AWS Serverless, Postgres).

Galen Robotics

Baltimore, MD

ELECTRICAL/SOFTWARE ENGINEER - (LEAD ELECTRICAL ENGINEER JUN. 2019-SEP. 2020)

May 2018 - May 2021

- Worked as a primary contributor on the electrical design of a collaboratively-controlled surgical robotics platform for minimally invasive surgeries targeting improved outcomes for patients and surgeons.
- Programmed sensor-based error checks, logging features, and motion trajectory constraints in C++.
- Improved smoothness of collaborative control through PID tuning of motor control.
- Led the designing (in Eagle), building, and testing of electrical architecture of the robotic system.
- Designed, built, and tested printed circuit boards (PCBs), cabling, and RFID antennas in electrical subsystems.
- Supervised team of electrical eng. interns. Led an iterative design process for electronics work with issue tracking.

Johns Hopkins University: Laboratory for Computational Sensing and Robotics

Baltimore, MD

UNDERGRADUATE RESEARCH ASSISTANT AT AUTONOMOUS SYSTEMS, CONTROL, AND OPTIMIZATION

Sept. 2016 - May 2018

LABORATORY (ASCO)

- Researched and implemented motion-based teleoperation for a robotic arm attached to a drone for application in aerial object manipulation using the Razer Hydra game controller, C++, and ROS.
- Implemented first person view teleoperation for aerial manipulation and installed flight control systems/components on drones.
- Advisors: Dr. Marin Kobilarov

Florida International University: School of Computing and Information Sciences

Miami, FL

UNDERGRADUATE RESEARCH ASSISTANT, NSF/DoD FUNDED REU

May 2017 - Aug. 2017

- Applied advanced statistical techniques to improve hyperparameter selection in augmented terrain-based navigation by robots.
- Used selection and weighting techniques to develop an algorithm for reducing autocorrelation to create combined parameter data maps for underwater localization. This algorithm achieved greater accuracy for localization.
- Developed software implementations of algorithm in Python and Matlab. Tested algorithm on historic data.
- Advisors: Dr. Niki Pissinou, Dr. Leonardo Bobadilla, Dr. Gregory Reis

Projects

Creating Motion Constraints

GALEN ROBOTICS

- Programmed feature to constrain surgical tool on an axis as robot was moved to improve first generation functionality of the system.
- This motion constraint feature allowed for better precision during surgery than using the tool freehand.
- Collaborated on calculations to approximate the angle of a robot joint and apply kinematic transformations to obtain the orientation to constrain the tool.

RFID Antenna Design

GALEN ROBOTICS

- Designed a prototype custom millimeter scaled RFID antenna on a PCB smaller than any existing off the shelf antennas to automate tool detection in a surgical robotic system.
- Developed a test bench of to determine effectiveness of several prototype antennas for this application.

Augmented Webcam Experience

COMPUTER VISION COURSE

- Developed a webcam experience that used finger+face tracking on real-time video to apply filters over the users face (MATLAB).
- Made filters select-able by the user depending on the number of fingers being held up in video. Filters changed in real-time.

Bluetooth Obstacle Avoiding Robot Car

ROBOT SENSORS/ACTUATORS COURSE

- Built a small robotic car that used ultrasonic sensors and an Arduino to detect and avoid obstacles autonomously.
- Integrated a Bluetooth sensor to enable wireless communication via phone to control car. Programmed in Arduino IDE.

Electronic Tracking for Earth Movers

ADVANCED ECE TEAM PROJECT COURSE

- Developed a proof-of-concept tracking system utilizing Kalman filter based noise reduction of Bluetooth sensors to reduce error in predicting location of Bluetooth beacon that would be placed on construction worker around construction vehicle.
- Created a position zone (estimated position of worker) and used weighted readings to reduce hysteresis seen by user. Prototyped in MATLAB.

Skills

Languages	Python, C++, C, Typescript, Javascript, Matlab, VHDL, Java
Software Libraries	Robot Operating System (ROS), OpenCV, scikit-learn, PyTorch, numpy, pandas, Gazebo
Software Tools/Misc.	Git, VSCode, Linux, Postgres, AWS, Jira, Bitbucket, Confluence, Qt Creator, Eclipse IDE
Electrical Skills	PCB Design, Circuit Analysis, FPGAs
Electrical Tools	Soldering, Test Equipment: Oscilloscopes, Function Generator, Multimeter, etc.
Other Skills	Research, Technical Writing, Proposal Writing, Presentation, Teamwork, Leadership

Publications

- Puleo, O., Sevimli, Y., Levi, D., **Bhat, A.**, Saunders, D., Taylor, R. (2019, June). Quantifying the Benefits of Robotic Assistance in Various Microsurgical Procedures. Paper presented at the Hamlyn Symposium in Medical Robotics, London, UK. doi: 10.31256/HSMR2019.8
- Sevimli, Y., Levi, D., **Bhat, A.**, Puleo, O., Taylor, R., Saunders, D. (2019, June). From Benchtop to Operating Room: The Evolution of the Galen Platform. Paper presented at the Hamlyn Symposium in Medical Robotics, London, UK. doi: 10.31256/HSMR2019.8
- Lahiri, D., Dua, R., Zhang, C., de Socarraz-Novoa, I., **Bhat, A.**, Ramaswamy, S., & Agarwal, A. (2012). Graphene nanoplatelet-induced strengthening of ultrahigh molecular weight polyethylene and biocompatibility in vitro. ACS applied materials & interfaces, 4(4), 2234-2241.