Azwad **Sabik**

ROBOTICS SOFTWARE ENGINEER · BIOMEDICAL ENGINEER

✉ azwadsabik@gmail.com | 🏠 www.azwadsabik.com | 💻 azwadsabik | in azwadsabik | U.S. Citizen

Education

The Johns Hopkins University   *Baltimore, MD*

M.S.E. IN ROBOTICS   *2015 - 2016*

- Specialization: Medical Robotics and Computer Integrated Surgical Systems
- Notable Coursework: Robot Systems Programming, Deep Learning for Image Understanding, Computer Vision, Representation Learning

The Johns Hopkins University   *Baltimore, MD*

B.S. IN BIOMEDICAL ENGINEERING   *2011 - 2015*

- Minors: Computer Integrated Surgery, Robotics
- Notable Coursework: Computer Integrated Surgery I & II, Artifical Intelligence, Algorithms for Sensor Based Robotics, Mechatronics

Skills

Computer Science	algorithms, data structures, object-oriented design, UNIX/Linux environments
Engineering	systems modeling & simulation, statistical analysis, data visualization, electrical & mechanical design, prototyping (Arduino)
Robotics	kinematics, machine learning, computer vision, control systems, state estimation (e.g. Kalman Filter, SLAM), path planning
Implementation	programming (Python, C/C++), software (ROS, MATLAB, Caffe, Git, R), libraries (NumPy, Scikit-Learn, OpenCV))

Projects

ROBOT SYSTEMS PROGRAMMING COURSE PROJECT   *Spring 2016*

- implemented ROS package enabling autonomous navigation and landing of quadrotor at target location within drone cage
- performed sensor fusion between readings from onboard cameras, IMU, and ultrasonic rangefinder to achieve odometry and state estimation
- utilized ROS packages for efficient kinematic transformations and AR tag detection; developed system in Gazebo simulation prior to testing

LEARNING THEORY COURSE FINAL PROJECT   *Spring 2016*

- implemented stochastic simulation of human gaze as coordinated motion of eyes and head in one dimension driven by optimal feedback control
- performed motion planning through iterative computation of optimal inputs (as gains via Bellman equation) and state estimates (as Kalman gains)

DEEP LEARNING FOR IMAGE UNDERSTANDING COURSE PROJECT   *Spring 2016*

- fine-tuned and validated modified version of AlexNet in Caffe framework to perform 1000-class classification of pill images (56.1% test accuracy)

MECHATRONICS COURSE PROJECT [COURSE COMPETITION FIRST PLACE]   *Spring 2015*

- built 3-DOF autonomous vehicle to perform scavenging and delivery task while adhering to competition's vehicle cost and size constraints
- implemented controllers for embedded sensing (CMUcam5, IMU) and actuation (DC/servo motors) as well as high-level control by Arudino Mega

Experience

Clear Guide Medical (medical device start-up)   *Baltimore, MD*

SOFTWARE ENGINEERING INTERN (MENTORED BY DR. PHILIPP J. STOLKA)   *Summer 2015*

- developed pipeline utilizing software-based automation of video analysis to achieve product compatibility with previously unsupported ultrasound devices, capable of reducing current process' time and required human effort by approximately 60%.

Tsinghua University (Tsinghua-JHU Biomedical Engineering Summer Exchange Program)   *Beijing, China*

RESEARCH INTERN (LABORATORY OF DR. HONGEN LIAO)   *Summer 2014*

- developed process to automate analysis of IVUS (intravascular ultrasound) image sequence and subsequently create 3D vasculature models aimed at assisting pathology diagnosis and assessment or providing guidance during vascular and transcatheter surgery.

NASA Ames Research Center (via National Space and Biomedical Research Institute)   *Mountain View, CA*

RESEARCH INTERN (ADVANCED CONTROLS AND DISPLAYS LABORATORY, MENTORED BY DR. BERNARD D. ADELSTEIN)   *Summer 2013*

- developed software to visualize and analyze motion trajectories of tele-operated robot manipulators in order to identify features potentially relevant to assessing tele-operator performance.

Loma Linda University Medical Center - Department of Radiology   *Loma Linda, CA*

RESEARCH INTERN (MENTORED BY DR. REINHARD SCHULTE)   *Summer 2012*

- developed software for detection of phantom markers in MRI and CT image sequences for purpose of stereotactic localization as a part of NIH-funded translational research project investigating proton therapy as a treatment for cardiac arrhythmias.