

Reuben Abraham T. Georgi

Email: reuben.abraham97@gmail.com • Phone No: On request • Personal Page: <https://ra-georgi.github.io/>

Robotics engineer with 3 years of experience possessing a Master's degree focused on Autonomy and Control. Experience and interests primarily centre around classical and learning based techniques of 3 major aspects of autonomous systems: Control, Planning and Perception. Interested in working hard on challenging and exciting projects while following best practices to create safe and reliable systems

EDUCATION

Purdue University

Master of Science in Aeronautics and Astronautics (MSAA)

West Lafayette, Indiana

May 2021

Punjab Engineering College

Bachelor of Technology (B.Tech) in Aerospace Engineering

Chandigarh, India

October 2019

WORK EXPERIENCE/INTERNSHIPS

Simelabs (Astek Group)

Robotics System Engineer

Kochi/Bangalore, India

February 2022- Present

Mobile Robot Demonstrator model

- Developed a web based mobile robot application using ROS2 and Turtlebot3 as a technology demo for the robotics team
- Utilized NAV2 for SLAM, PyQt for creating a local GUI interface and OpenCV for handling vision tasks incorporated in the model

R&D Automation Project (At **West Pharmaceutical Services**)

- Simulated and programmed ABB (Yumi, GoFa) and Omron Robots (TM5) for process checking, layout & cycle time optimization and assembly operations
- Implemented system using ROS2 (Moveit2) for ensuring collision free trajectories during assembly line stoppages and reducing manual intervention and programming

AbbVie Inc.

Research Analyst/ Summer Intern

Chicago, USA

July-September 2020

- Conducted CFD simulations in M-Star CFD and Ansys to characterize the hydrodynamics of USP dissolution apparatus
- Performed post-processing and analysis of results obtained from simulations using Paraview with the results published in Journal of Pharmaceutical Sciences

Helicopter Division, Hindustan Aeronautics Limited

Intern

Bangalore, India

January-May 2018

- Internship Project: Mathematical modelling of helicopter blades to simulate response and predict performance of an isolated rotor

SPACE lab, Khalifa University

Intern

Abu Dhabi, U.A.E

May-July 2017

- Assembled and programmed Tetrax ranger using MATLAB and Arduino for line following control tasks and set up a Pumpkin CubeSat kit using MPLAB

SELECTED PROJECTS

3D Planning and Control of Quadcopter

- Implemented Python class to simulate Quadcopter flight along with techniques for control and planning for different simulation conditions including obstacle avoidance and controller saturation
- Techniques for control and planning implemented: PID, LQR, MPC, iLQR

3D SLAM

- Implementation of the extended and unscented Kalman filter (EKF, UKF) in Python for simultaneous localization and mapping in 3 dimensions
- Considered scenario with known correspondences and unknown number of landmarks with uncertainty introduced by adding noise to odometry and sensor measurements

Reachability Analysis for Pursuer-Evader Dynamic Games

- Computed backward reachable sets for dynamic games involving a superior evader using the Level Set Toolbox on MATLAB
- Investigated the impact of the number of pursuers and their speed ratio on the backwards reachable set

Quadcopter Design using Genetic Algorithm

- Formulated a multi-objective problem to minimize cost and weight of a quadcopter
- Generated Pareto frontier and identified best combination of components from available options

Genetic Algorithm Based Approach for Path Planning in a Static Environment

- Utilized a point-based approach to generate the shortest collision free path for an agent
- Examined the effects of varying the type of crossover operation on the solution

TECHNICAL SKILLS

Languages: • **MATLAB** • **Python** • **C++**

Packages/Libraries: • **ROS: NAV2, Moveit2** • **Numpy** • **Matplotlib** • **OpenCV** • **JAX**

Other software: • **ABB Robotstudio/RAPID** • **ANSYS** • **Arduino** • **Simulink**

PUBLICATIONS

Alexander M. Kubinski, Gayathri Shivkumar, Reuben A. Georgi, Susan George, James Reynolds, Ricardo D. Sosa, Tzuchi R. Ju, **Predictive Drug Release Modeling Across Dissolution Apparatuses I and II using Computational Fluid Dynamics**, Journal of Pharmaceutical Sciences, Volume 112, Issue 3, 2023, Pages 808-819, ISSN 0022-3549, <https://doi.org/10.1016/j.xphs.2022.10.027>.
