

Reuben Abraham T. Georgi

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Robotics engineer with 3 years of experience and a Master's degree in Control and Autonomy. Experience and interests centre on classical and learning-based techniques for control, planning, and perception. Striving to develop safe and reliable autonomous systems for real-world deployment

EDUCATION

Purdue University

Master of Science in Aeronautics and Astronautics (MSAA)

West Lafayette, USA

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 Application Demo

- Developed a web-based mobile robot application using ROS2 and Turtlebot3 as a technology demo for the robotics team
- Utilized Nav2 for SLAM & navigation, PyQt for creating a local GUI and OpenCV for handling vision tasks incorporated in the model

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

- Currently working on using RealSense depth camera data for component pose estimation with Open3D
- Simulated and programmed ABB (Yumi, GoFa) and Omron (TM5) robots for process checking, layout & cycle time optimization and assembly operations
- Developed proof of concept projects for:
 - Ensuring collision free trajectories during assembly line restarts using Moveit2 with ROS to reduce manual intervention and programming
 - Remote visualization of assembly operations in real-time using Robotstudio to communicate with robots and PLC

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 results published in the 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 TETRIX Ranger using MATLAB and Arduino for line following 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 in different conditions including obstacle avoidance and controller saturation
- Implemented the following techniques for control and planning: PID, LQR, MPC (Model Predictive Control), iLQR (Iterative Linear Quadratic Regulator)

3D SLAM

- Implemented the extended and unscented Kalman filter (EKF, UKF) in Python for simultaneous localization and mapping in 3 dimensions
- Simulated scenarios with known correspondences and unknown number of landmarks and introduced uncertainty 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
- Analysed the impact of the number of pursuers and their speed ratio on the backwards reachable set

Quadcopter Design using Genetic Algorithms

- Formulated a multi-objective problem to minimize cost and weight of a quadcopter subject to performance and integration constraints
- Developed MATLAB app for users to provide data and to visualize results, including the Pareto frontier which displays Pareto optimal solutions.

TECHNICAL SKILLS

Languages: **MATLAB, Python, C++**

Packages/Libraries: **ROS: Nav2, Moveit2, Gazebo, NumPy, Matplotlib, OpenCV, JAX**

Other software: **ABB Robotstudio/RAPID, RoboDK, Simulink, ANSYS, Arduino**

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>.

Alexander M. Kubinski, Ricardo D. Sosa, Gayathri Shivkumar, Reuben Georgi, Susan George, Eric J. Murphy, Tzuchi R. Ju, **Predictive dissolution modeling across USP apparatuses I, II, and III**, Journal of Pharmaceutical Sciences, Volume 114, Issue 6, 2025, 103765, ISSN 0022-3549, <https://doi.org/10.1016/j.xphs.2025.103765>.
