Reuben Abraham T. Georgi

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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 — West Lafayette, Indiana
Master of Science in Aeronautics and Astronautics (MSAA) — May 2021

Punjab Engineering College — Chandigarh, India
Bachelor of Technology (B.Tech) in Aerospace Engineering — October 2019

WORK EXPERIENCE/INTERNSHIPS

Simelabs (Astek Group) — Kochi/Bangalore, India
Robotics System Engineer — 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. — Chicago, USA
Research Analyst/ Summer Intern — 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 — Bangalore, India
Intern — January-May 2018

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

SPACE lab, Khalifa University — Abu Dhabi, U.A.E
Intern — May-July 2017

- Assembled and programmed Tetrix 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.

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.