FRANCIS JOSEPH

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OBJECTIVE

To develop algorithms for **planning** and **control** of mobile robots.

EDUCATION

UNIVERSITY OF CALIFORNIA, San Diego USA
Graduate (MS) Student
Expected June 2018
Concentration: Robotics

PES INSTITUTE OF TECHNOLOGY, Bengaluru India
(**VISVESVARYA TECHNOLOGY UNIVERSITY**)
BE in Mechanical Engineering
September 2008 - June 2012

COURSE WORK

Robot Motion Planning
Linear Control Systems
Principles of Artificial Intelligence:
Probabilistic Reasoning and Decision-Making
Estimation & Sensing
Optimal Control
Robot Manipulation
Design & Analysis of Algorithms

SKILLS

- C • C++ • Python • MATLAB • ROS
- TensorFlow • Keras
- Pybullet • OpenAI Gym • MuJoCo
- Robotics Toolbox (MATLAB)
- OpenCV • G code
- Excel (VBA/Macros) • LaTeX
- GIT • SVN Subversion
- Linux • Windows

SIDE PROJECTS

- Gaussian model to **detect** red barrels.
- Kalman filter to **track position** of camera.
- Particle filter to **localize** a robot for SLAM.
- Strain sensors to **map** internal coral reef.
- RRT **planner** for a two-link arm.
- RRT* **planner** for a 2D workspace.
- JPS incremental **planner** for a 2D space.

WORK EXPERIENCE

PLUSAI Palo Alto, CA
Intern – Member of Technical Staff **June 2017 – September 2017**

- Learnt a **steering model** using data from the self-driving car.
- Worked on a **planner** for unstructured driving.
- Developed a **controller** in C++ for highway driving of the car.
- Developed a **simulator** in python to simulate scenarios in highway driving.

ESI SOFTWARE PVT. LTD. India – An affiliate of ESI Group
Software Engineer **August 2012 – July 2016**

- Developed **features for the pre-processor software too**l to determine the characteristics of the material after welding and heat treatment.
- Worked with **vector manipulation and algorithms** to find geometric parameters from meshed CAD models.
- Developed in **C++** and created automated testing code using **python**.

PES INSTITUTE OF TECHNOLOGY, India
Guest Lecturer **August 2013 – May 2014**

- **Taught** Basics of Automotive Engineering.

PROJECTS

LEARNING TO CONTROL A SELF-FOLDING ROBOT **September 2017 – Present**
Bio-Inspired Robotics and Design Lab, UC San Diego

- Collected data using an **Optitrack** system.
- Developing a suitable **function approximation** for the model.
- Checking the performance of **open loop control** policies.

AUTONOMOUS MAIL DELIVERY, UCSD **January 2018 – Present**

- Using Open Planner to simulate **planning** algorithms.
- Understanding **mapping** data.
- Understanding the Autoware **software stack** to implement on the car.

LEARNING CONTROLS OF A TWO-LINK ARM **April 2017 - June 2017**

- Learnt the **controls** of a two-link arm as a reinforcement problem without knowledge of the model of the arm.
- Used **MuJoCo** for simulation with **OpenAI Gym** and **TensorFlow**.

TEAM HAYA (Team Lead) **August 2010 - July 2011**

- Developed the **kinematics** and **fabricated** a short throw gear shifter.
- Car **won** the SAE dynamic handling event.