Jerrin **Bright**

REALTIME PERCEPTION · AUTONOMOUS SYSTEMS

✉ jerriebright@gmail.com | ⌂ jerriebright.github.io | ⊙ jerriebright | in jerriebright

Summary

A versatile and self-motivated engineer highly skilled in Autonomous Systems and Robotic Real-time Perception, focusing on aerial systems and autonomous cars. I am an ardent follower of cricket, chess and loves travelling.

Education

Vellore Institute of Technology *Chennai, India*
B.TECH. IN MECHANICAL ENGINEERING *June 2018-May 2022*
- Research: An End-to-End Autonomous UAV System in GPS-Denied and Unstructured Environments.
- Supervisor: Dr. Arockia Selvakumar Arockia Doss

Research Experience

Indian Institute of Science *Bangalore, India*
RESEARCH INTERN, AI AND ROBOTICS PARK (ARTPARK) *July 2021- May 2022*
- Autonomous navigation of UAVs in uncluttered and unstructured environments using various sensor sub-systems.
- Implementation of Model Predictive Control, Control Barrier Functions, DL based Depth Estimation, etc.
- Hands on with Jetson boards, Realsense, Jevios components and turtlebot, DJI M600, Jetbots and custom UAVs
- **Supervisors:** Mr. Badrinarayanan Rangarajan and Prof. Suresh Sundaram

McMaster University *Ontario, Canada*
GLOBALINK RESEARCH INTERN *July 2021- September 2021*
- Designing of a four Degree of Freedom (DoF) soft robotic manipulator in PyBullet simulation engine using Soft Motion (SoMo) toolkit.
- Supplied sinusoidal torque to the actuators and plotted the velocity, position, acceleration, and input (torque) to analyze different actions.
- **Supervisor:** Prof. Gary Bone

Arizona State University *Phoenix, USA*
SUMMER RESEARCH INTERN *May 2021 - July 2021*
- Using laser scanning, and photogrammetry to digitize environments via visualizing data collected from sensors fusing into a unified system.
- DL algorithms are used for automated analysis. The digital representations made will be processed to provide insights to builders, and stewards.
- **Supervisor:** Prof. Thomas Czerniawsk

Aero2Astro *Chennai, India*
AUTONOMOUS SYSTEM DEVELOPER - INTERN *October 2020- April 2021*
- Developing ROS-based autonomous navigation firmware using Visual Inertial SLAM concepts for indoor environment.
- Implementation was based on Sensor Fusion techniques, Extended Kalman Filters and is aimed to eradicate the need for GPS thus making the system/ firmware more reliable.

Yuan-Ze University *Taoyuan City, Taiwan*
PROJECT RESEARCH INTERN *April 2020– June 2020*
- Built a robust smart parking system using semantic segmentation with Convolutional Conditional Random Fields and Atrous Convolution enhance the visual capability of the system.
- **Supervisor:** Prof. Wei-Tyng Hong

Area of Expertise

Simulation Tools	: **AirSim, Fusion360, SolidWorks, Proteus, Gazebo, RViz, MATLAB, SOFA**,
Coding Tools	: **C, C++, Python, Embedded System, HTML, CSS, JS, PHP**,
ML Tools	: **OpenCV, TensorFlow, Matplotlib, NumPy, Keras, PyTorch, Scikit**,
Others	: **Linux Ubuntu, ROS, Raspbian OS, Window**,

Publication

ME-CapsNet: A Multi-Enhanced Capsule Networks with Routing Mechanism
Submitted to IEEE 8th International Conference on Electronics, Computing and Communication Technologies

A Comprehensive Study on Autonomous Navigation using Learning Techniques for Robotic Systems
Submitted to MDPI Sensors

Optimization of quadcopter frame using generative design and comparison with DJI F450 drone frame
International Conference of Robotics, Intelligent Automation and Control Technologies

Honors & Awards

Globalink Graduate Fellow, MITACS Canada
Outstanding Research Paper Award, RIACT International Conference, 2020
Recognized Galactic Problem Solver, NASA International Space Challenge, 2020
Top Ten Internationally, International Planetary Aerial Challenge, 2021

Projects

Autonomous UAV Navigation using Imitation Learning
May 2021- July 2021
IISc, Bangalore
- Implemented a simple UAV navigation using imitation learning technique.
- The policy was trained using the dataset from RRT-MPC-based UAV navigation in cluttered environments using AirSim simulation environments.
- Attention-based networks were used as the base model to imitate the expert.

SLAM embedded AGV for autonomous navigation
Sep 2020– Oct 2020
Vellore Institute of Technology
- Implemented 3D mapping using Kinect and IMU sensors in an indoor environment.
- The Visual Inertial Navigation System was used to make the 3D map simulated in the Gazebo environment and visualized 2D in RViz.
- Feature extraction via Oriented fast and Rotated Brief (ORB) was used for extraction and tracking.

Autonomous MAV enhanced with door-to-door delivery topographies
Jan 2020– April 2020
Eyantra- IIT Bombay
- Developed a ROSpy based control system for a MAV to transverse to a set of GPS setpoints autonomously picking and delivering a package.
- The Control System has two modules, namely the Altitude (AC) and the position (PC) controller.
- AC stabilizes the drone using a PID-based controller. PC takes in the target GPS coordinates and has setpoint values and navigates successfully.

Custom 3D Pose Estimation Toolkit for Robotic Systems
Jan 2020– April 2020
Aero2Astro
- Developed a toolkit to reconstruct ubiquitous environments using Oriented FAST and Rotated Brief feature detector and descriptor, FLANN for matching, RANSAC for outlier removal, Optical flow, PnP (DLT and Levenberg) for estimating the pose of the robot.

Membership

IEEE, Robotics and Automation Society
Atom Robotics, Co-Founder and Senior Advisor
ValueML, Machine Learning Contributor
Madras Scientific Research Foundation, Research Fellow
National Service Scheme, Active Member