JERRIN BRIGHT

LINKEDIN | PORTFOLIO | GITHUB | MAIL | SCHOLAR | BLOGS

PERSONAL PROFILE STATEMENT

A versatile and self-motivated engineer highly skilled in Autonomous Systems and Robotic Real-time Perception, focusing on aerial systems and autonomous cars. Driven by desire for challenges that push me beyond my limits and eventually aid in the advancement of society regardless of affordability and background.

QUALIFICATIONS

Vellore Institute of Technology, Chennai, India _June 2018-Present_
Bachelors of Technology in Mechanical Engineering _Cumulative GPA: 8.25/10.0_
Chettinad Vidyashram, Chennai, India _June 2003-May 2018_
CBSE – Computer Science _10^{th} CGPA 9.4/10.0, 12th 83.2%_

PROFESSIONAL EXPERIENCE

Research Intern @ Indian Institute of Science, Bangalore, India _July 2021 - Present_
Unsupervised monocular 3D dynamic obstacle avoidance using guided semantic segmentation for the depth map estimation, solving the small object detection, depth estimation problem. Kinodynamic, Hybrid A* and MPC for trajectory and control. **(Supervised by Prof. Suresh Sundaram, Badrinarayanan Rangarajan)**

Globalink Research Intern @ McMaster University, Ontario, Canada _July – Sep 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. **(Supervised by Prof. Gary Bone)**

Summer Research Intern @ Arizona State University, Phoenix, USA _May - July 2021_
Using laser scanning, 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, stewards. **(Supervised by Prof. Thomas Czerniawski)**

Autonomous System Developer (ASD) - Intern @ Aero2Astro, India _Oct'20 - April'21_
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.

Data Science Intern @ BrainMagic InfoTech Pvt, Chennai, India _May – July 2020_
Automobile fault detection using vision techniques resulting in an IOU of 95%. Dimensional analysis was done to locate defects and monitor it. Later, it was deployed in AWS using Amazon Sagemaker and S3 Buckets.

Project Research Intern @ Yuan Ze University, Taoyuan City, Taiwan _April – June 2020_
Built a robust smart parking system using semantic segmentation with Conv. Conditional Random Fields and Atrous Convolution enhancing the visual capability of the system. **(Supervised by Prof. Wei-Tyng Hong)**

Team Captain and Co-Founder @ Atom Robotics, VIT Chennai, India _Jan 2019 – Oct 2021_
Advisory Board Committee @ Atom Robotics, VIT Chennai, India _Nov 2021 - Present_
An Intelligent Robotics and Satellite exploration team consisting of 50+ aspiring young minds. The team focuses on Intelligent ground vehicles, Can-Satellites and Planetary Aerial Systems.

RESEARCH AND PUBLICATIONS

Jerrin Bright et al 2021 IOP Conf. Ser.: Mater. Sci. Eng. 1012 012019 [**Paper link**]
Optimization of quadcopter frame using generative design and comparison with DJI F450 drone frame

AREA OF EXPERTISE

Design and Simulation Tools	Fusion360, SolidWorks, Proteus, Gazebo, RViz, MATLAB, SOFA
Programming Tools	C, C++, Python, Embedded System, HTML, CSS, JS, PHP
Machine Learning Tools	OpenCV, TensorFlow, Matplotlib, NumPy, Keras, PyTorch, Scikit
Platforms	Linux Ubuntu, ROS, Raspbian OS, Windows
Linguistic knowledge	Fluent: English; Intermediate: German, Hindi; Native: Tamil

ACCOLADES AND RECOGNITION

Outstanding Research Paper Award	RIACT 2020 International Conference
Recognized Galactic Problem Solver	NASA International Space Challenge
Winner of Line Follower, NIT Trichy	CURRENTS 2020, National Techfest
Second Runner-up, IEEE Hackathon	APOGEE 21, BITS Pilani Campus
Top Ten Internationally	International Planetary Aerial Challenge 2021

RESEARCH PROJECT

3D Pose Estimation using Stereo Visual Odometry *Jan – April 2020*

Development of python package to reconstruct indoor and outdoor environments with diverse texture contrasts 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 robot.

Autonomous MAV enhanced with door-to-door delivery topographies *Jan – April 2020*

Developed a ROSpy based control system for a MAV to transverse to a set of GPSs setpoint 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 coordinate has setpoint values and navigates successfully to the desired coordinates.

SLAM embedded AGV for autonomous navigation *Sep – Oct 2020*

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 Planetary System for Mars Exploration *Jan – Feb 2021*

Designed a VTOL-UAV from scratch including CFD analysis for propellers and Aerofoil. Designed and tested PCBs using Fritzing. Communication using XBee 900MHz. ROS was used for Software systems (Visual SLAM and PID Control for rudder, elevator and ailerons for horizontal and one for R-P-Y during lift).

Vestium- Smart Robotic Closet *May – Oct 2020*

Designed an 80*80 smart robotic furniture, which maximizes small spaces which will be poised to transform urban living. It is packed with plenty of space, hiding the bed when not in use, and allows optimizing space, at the touch of a button. It can be used as entertainment center, home office, bedroom, storage all in one closet.

Robust Chest X Ray Detection Architecture *July – Oct 2019*

Built a convolutional system for x-ray detection of 14 different chest diseases. Some of the important tools used in the system are transfer learning fusing Residual Networks with UNet, Data Augmentation techniques and autonomous cropping using contours and extrema.

Competition-based Robots *Jan 2019 – Mar 2021*

Designed and built Intelligent Ground Vehicles, Planetary Aerial Systems, Can-Satellites, Law Following Robot, Obstacle Racer, Robo-Soccer, Maze Runner, Sumo Robot, BattleBots with my team (Atom Robotics).

EXTRA-CURRICULAR

Machine Learning Contributor *Oct 2020 – Feb 2021*

Contributing ML blogs via CodeSpeedy to various blog-based companies. Have published 13 blogs.

Madras Scientific Research Foundation, NGO *Oct 2020 – Dec 2020*

Researched on various cutting-edge areas of Manufacturing, Robotics and Vision systems. Also, spreading awareness on basic robotics in schools and amongst unprivileged kids was done as part of the NGO.

Robotics Club, VIT *Jan 2019 – Mar 2021*

Have organized and led several events including the National Level Robotics Competition as the Overall Student Coordinator, ABB Robotics and several other workshops.

Institute of Electrical and Electronics Engineer *April 2019 – May 2020*

Active Member of Robotics and Automation Society (RAS).

National Service Scheme *May 2019 – July 2021*

Active Member of Indian Government sponsored public service program. Part of several awareness programs – International Coastal Cleanup Day, Community Services, planting of saplings, medical camps.