

# JERRIN BRIGHT

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## 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**  
Bachelors of Technology in Mechanical Engineering  
**Chettinad Vidyashram, Chennai, India**  
CBSE – Computer Science

*June 2018-Present*  
*Cumulative GPA: 8.25/10.0*  
*June 2003-May 2018*  
*10<sup>th</sup> CGPA 9.4/10.0, 12<sup>th</sup> 83.2%*

## PROFESSIONAL EXPERIENCE

**Research Intern @ Indian Institute of Science, Bangalore, India** *July 2021 - Present*  
Unsupervised monocular 3D dynamic obstacle avoidance using semantic map and flow map (optical flow + depth map). Depth estimation and free-space segmentation was done. Faster RCNN and a refinement network was fused to detect small obstacles like cable wires, etc. and 3D motion planning using RRT algorithm was done to find the optimal path. **(Supervised by Prof. Suresh Sundaram)**

**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 digitalize 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, 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. Sensor Fusion of Camera and IMU using EKF to avoid failures or losses or sparse environmental conditions. **(Supervised by Prof. Wei-Tyng Hong)**

**Team Captain and Co-Founder @ Atom Robotics, VIT Chennai, India** *Jan 2019 – Oct 2021*  
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

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

## ACCOLADES AND RECOGNITION

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**Outstanding Research Paper Award**  
**Recognized Galactic Problem Solver**  
**Winner of KURUKSHETRA'20, CEG Anna University**  
**Second Runner-up, IEEE Hackathon**  
**Top 10 Internationally**

RIACT 2020 International Conference  
NASA International Space Challenge  
RoboZest, National Level Techfest  
Apogee'21, BITS Pilani Campus  
International Planetary Aerial Challenge

## RESEARCH PROJECT

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**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 (ORB) feature detector and descriptor, FLANN for matching and RANSAC for outlier removal and Optical flow and 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. Visual Inertial Navigation System was used to make the 3D map simulated in 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 system (Visual-based 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 to optimize space, at touch of a button. It can be used as an entertainment center, home office, bedroom, storage all in one closet.

**Robust Chest Xray 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

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**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 'ROBOPRIX' 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, etc.

## DECLARATION

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I, Jerrin Bright, hereby affirm that the aforesaid info is true to my knowledge, as of October 9<sup>th</sup>, 2021.