Varundev Suresh Babu

Computer Engineer

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Education

Ph.D. Computer Engineering
Dissertation: *Agile Autonomous Racing*
University of Virginia
2021 (Expected) | Charlottesville, VA

M.Sc. Computer Engineering
Specialization: Cyber-Physical Systems
University of Virginia
2016 - 2018 | Charlottesville, VA

BEng., Electronics Engineering
Visvesvaraya Technological University
2010 - 2014 | Karnataka, India

Technical Skills

Overview

$0\ Projects \longrightarrow 10\ Projects$

Computer Vision

Machine Learning

Robot Operating System

Programming

$0\ LOC \longrightarrow 5000\ LOC$

Python

MATLAB • LaTeX

C • C++

Capabilities

- System Architecture Design
- Rapid Prototyping
- Systems Integration
- Control Systems Design
- UAV & UGV Design

Professional Summary

Dedicated Computer Engineer with extensive research experience in robotics & embedded software. Detailed & goal oriented. Excellent technical & communication skills, with proven record of obtaining funding & designing elegant solutions.

Experience

2019 - Present — **Graduate Research Engineer** — **University of Virginia**
UVA Link Lab

- Created a fleet of scaled autonomous Ackermann-steering robots using off-the-shelf components & embedded computer
- Implemented full perception, planning & control pipeline using a combination of traditional and deep-learning techniques
- Used TensorRT, PyTorch, ROS

2016 - 2017 — **Product Engineer** — **Scanoptix**
Research & Development

- Used model-based feedback from existing Ophthalmoscope to obtain optical & mechanical framework
- Initiated a large python-based project framework using git, Jira, Confluence & Trello with over 250 personal commits
- Used rapid prototyping techniques to build and verify design theories; integrated results from user testing for improved product

Projects

2019 - Present — **Agility in Autonomous Vehicles** — **UVA Link Lab**
Lead Engineer
Used 1/10 scaled autonomous cars to test agility, safety & reliability of navigation algorithms; achieved full loop closure using traditional control methods; currently working on deep learning based perception for multi-agent cooperative & adversarial racing

2018 - 2019 — **F1/10 Autonomous Racing** — **UVA Link Lab**
Lead Engineer
Customized fast obstacle avoidance & path tracking algorithms for a non-holonomic robot; improvised ROS navigation plugins using GPU particle filters & software-based state estimation for high-speed loop closure; participated & won international competition

2017 - 2018 — **UAV Assisted Radio Telescope Calibration** — **UVA-NRAO**
Co-PI, Beam Mapping Project
Custom built heavy-lift autonomous hexrotor for high precision 3D navigation; currently being field tested to be used by NRAO for generating radiation pattern of new antenna designs; used PX4, with optical flow and range finders for precision non-GPS navigation

Achievements

2019 — **Invited Speaker**
Presenting work on autonomous racing simulator
ROSCon 2019 - Macau

2019 — **Named Inventor**
Re-engineered a lightweight Video Indirect Ophthalmoscope (VIO)
United States Patent 10,376,142

2018 — **Raised $10,000 as Student Entrepreneur**
Designed UAV based quick response solutions for law enforcement
Received combination of investments, NSF & private grants