Abhishek Balasubramaniam
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Education

Masters of Science in Computer Engineering Expected Graduation: Dec 2021
Colorado State University, Fort Collins, Colorado CGPA: 3.58/4

- Courses include: Hardware/Software system design in embedded system; Introduction to robot programming and Simulation; Many core system design using machine learning; Advanced Computer Architecture and Digital Image processing; Machine learning; Embedded systems and machine learning

Bachelor of Technology Mechatronics Engineering June 2013 – April 2017
Hindustan University, Chennai, TamilNadu, India CGPA: 7.3/10

- Courses include: 2D/3D modelling; C++; Python; ROS; Arduino; Robotics; and Artificial Intelligence

Experience

Graduate Research Assistant January 2020 – Present
Colorado State University, Fort Collins, Colorado

- Object detection model optimization techniques using Keras and Tensor flow. Optimization techniques such as Pruning, Quantization, Knowledge distillation, Encoding and decoding, and Co-optimization are used. We use Jetson Tx2, Drive Px2 for evaluation.

CAVS Technical Advisor Sept 2019 – Jan 2020
Colorado State University Vehicle Innovation Team

- Ecocar Mobility challenge is an competition in which we develop a prototype of Level 2 automotive vehicle.
- My role as a graduate student is to come up with ideas that can improve the CAVS system performance.

Co-founder and Machine Learning Architect Oct 2017 - Jun 2019
Cambionix Innovations, Chennai, India

- Co-founded Cambionix Innovations with the vision to enhance user experience and automate small and medium scale industries.
- I was responsible for design, integrate and innovate solution to enhance the performance of existing mechanical devices.
- Top 10 best engineering services start-up in India 2018 by Silicon India Magazine.

Professional Skills

Programming Languages & System Integration:
C++, Java, Python, HTML, CSS, Node js, Angular js, PHP, JavaScript and Android, AWS, Azure, SQL, MongoDB, Oracle.

Machine learning Packages & Tools:
TensorFlow & lite, PyTorch, Cuda, Keras, Jupiter, Paperspace, AWS.

Robotics Software and Hardware platform:
Robot Operating System, Arduino, Processing, PLC programming, MATLAB, Arduino, Raspberry Pi, Nvidia JTK1 and JTK2, Intel Microprocessors, Jetson TX2.

Designing & simulation:
Auto-cad, Fusion 360, Blender, Solidworks, Illustrator, Qt Designer, Lab-view, Fluid SIM.

Projects

ROS Based Stereo Vision System For Autonomous Navigation

A Stereo vision based autonomous navigation system that used Deep learning model for Object Detection and Navigation. ROS For communication and an android app with ROS backend for GPS data acquisition.

Wireless ultrasound and body monitoring device

Designing and fabricating a compact ultrasound device which has a wireless data transmission via Wi-Fi.

Unmanned aerial vehicle with position and altitude lock with GPS based navigation system

An ROS based drone with altitude and position lock in which we used Neural network and Fuzzy logic for controls.

Android Based Position Tracking Robot

A semi-Autonomous vehicle that used an android app to avoid obstacles and navigate using OpenCV and ROS as Backend.

Automatic dial gauge calibrator

I developed a prototype of an automated dial gauge calibration device with universal dial gauge probe adapters using a microprocessor based DAC which can be used as an alternative for Digital Read Out machine.

Cartesian Drawing Robot

I developed a 2D drawing machine using Arduino microcontroller and processing software. I used a Selective Compliance Articulated Robot Arm configuration for the robot.

Projects for Competition

Hindustan mars Rover Team

As a Technical Team Manager I was responsible for designing the technical aspects of the prototype of a Martian rover for the competition "University Rover Challenge 2014" which was held by Mars Research Society USA, UTAH. We secured 10th place out of the 36 finalist and we secured 2nd place out of 8 finalist from India

Team Falcon Team

I developed an autopilot system for the competition DRONES FOR GOOD conducted by government of UAE. Deep learning model for Object Detection and Navigation.

Publication

- B. Abhishek, K. Keshav, S. Gautham, D. V. R. R. Samuel and S. R. Nair, "Low cost ROS based semi-autonomous drone with position and altitude lock," 2017 IEEE International Conference on Power, Control, Signals and Instrumentation Engineering (ICPCSI), Chennai, 2017, pp. 2109-2112.
- B. Abhishek, S. Gautham, D. Varun Rufus Raj Samuel, K. Keshav, U. P. Vignesh and S. R. Nair, "ROS based stereo vision system for autonomous vehicle," 2017 IEEE International Conference on Power, Control, Signals and Instrumentation Engineering (ICPCSI), Chennai, 2017, pp. 2269-2273.
- Abhishek Balasubramaniam, Shyam Nair, Allen Frederick I. A. "Arachnidan 6 Wheeled All Terrain Explorer Equipped with a 7 DOF Robotic Arm", *20st International Mars Society Convention, Mars Society, USA*
- Abhishek Balasubramaniam "Dinoponera 6 Wheeled Exploration Vehicle and Swarm Bots", *20st International Mars Society Convention, Mars Society, USA*

Achievements

- Top 10 best engineering services start-up in India 2018 by Silicon India Magazine
- Invited as a speaker to present a model on Mars rover in 20th International Mars Society convention and 21th International Mars Society convention
- 17th place in University Rover Challenge 2015 conducted by Mars Research Society, Utah, USA
- Finalist in the competition "Robotryst 2013" conducted by Robosapiens at IIT DELHI

Membership in Organization

- Institute of Electrical and Electronics Engineers
- ROS Community
- Pycon India
- Mars society India

Languages Known:

- Tamil (Native speaker)
- English (Proficient) IELTS: 7