

VENGATESAN GOVINDARAJU

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Singapore
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EDUCATION



Doctor of Philosophy, (Jan 2013 - April 2017)
National University of Singapore
Supervisor: Assoc. Prof. Gerard Leng Siew Bing
Thesis Title: Path Planning Strategies for Visibility Enhancement with Unmanned Aerial Vehicles in Cluttered Environments



Bachelor of Technology, Mechanical Engineering (July 2007 - May 2011)
National Institute of Technology - Trichy
Master of Business Administration (Online) (May 2018 - Feb 2019)
Quantic School of Business and Technology, Washington, D.C.

PROFESSIONAL EXPERIENCE

Panasonic

Senior Staff Engineer at 'Panasonic Research & Development Center Singapore', (July 2019 - Present)

3D Reconstruction:

- Developed real-time hyper realistic 3D reconstruction pipelines for indoor environments using vision sensors (Monocular, Stereo, and Depth) with technologies like StructureFromMotion, MultiViewStereo, Gaussian Splatting, and NeRF.
- Created 3D/UI tools to demonstrate 3D relighting of reconstructed spaces.

Visual SLAM technologies:

- Improved localization performance for autonomous vehicles, delivery robots, and wheelchairs by enhancing SLAM algorithms.
- Parallelized data collection and mapping processes, demonstrating a real-time auto-parking system that reduced overall operational time.
- Designed the software architecture for a mobile app-based Visual Positioning System with Augmented Reality for personal navigation.

Robotics technologies:

- Technical Lead for development RISE robot platform from scratch for indoor inspection of built environments.
- Led the migration of the HOSPI delivery robot from ROS1 to ROS2 and developed a ROS2-based adapter for the Robotics Middleware Framework (RMF), facilitating integration with smart building infrastructure.

Technical Leadership:

- Introduced automation and productivity tools, including tmux and Docker, to streamline robot bring-up processes, enhancing development and testing efficiency.
- Implemented Scrum-based product development methodologies within the team, improving workflow and collaboration.

Senior Engineer (Navigation) at 'Aitech Robotics and Automation Pte. Ltd.' (Singapore), (July 2017 - June 2019)

- Developed reflector-based mapping and localization, sensor-fusion (IMU, Lidar) and control algorithms, for several medium/heavy-duty autonomous mobile-robots (differential, ackermann, tricycle, omni-directional), for intra-logistics applications.
- Implemented highly accurate vision-based table-docking system for a 10-ton payload omni-directional mobile platform.
- Worked on design, procurement, fabrication, testing and deployment at customer site by spearheading robotics, IT and operations teams to complete projects on time.





Aviation Officer, at Mumbai International Airport, (Sept 2011 - Nov 2012)
Indian Oil Corporation Ltd.

- Maintenance in-charge of fuel pumping equipments, vehicles. Also, proactively developed a software application for efficient scheduling of Aircraft Refuelling Operations

TEACHING EXPERIENCE

Associate Lecturer Taught Industrial Robotics, Robot communications and Team Project modules at PSB Academy.

Teaching Assistant at NUS for modules EG1109 - Statics and Mechanics of Materials and ME3112 - Mechanics of machines. (Spring 2014, Fall 2015 resp.)

NOTABLE PUBLICATIONS



Conferences

1. Vengatesan G, Takrit T, Zheng W *Mobile-robot and Cloud-based Integrated Defect Inspection System for Indoor Environments* , Proceedings of the 40th International Symposium on Automation and Robotics in Construction (ISARC 2023) (Jul - 2023).
2. Vengatesan G, Gerard Leng, Zhang Qian, *Visibility-based UAV path planning for surveillance in cluttered environments* , 12th IEEE International Symposium on Safety, Security, and Rescue Robotics, Toyako - Japan (Oct - 2014)



Journals

1. Vengatesan G, Gerard Leng, Zhang Qian, *Multi-UAV Surveillance over Forested Regions* , Photogrammetric Engineering and Remote Sensing, No. 12, pp. 1129-1137(9) (Dec - 2014)

ACADEMIC ACHIEVEMENTS

Won prizes at robotics competitions at national level technical festivals such as **IIT-Bombay TechFest - 09, IIT Madras Shaastra - 09.**

BAJA - SAE All Asia: Participated in **SAE-Baja** All Asia 2010 - All terrain vehicle design and fabrication competition held at NATRIP facility, Pithampur, Indore.

PROJECT WORKS

- ‘Stereo Camera Calibration and 3D coordinate measurement using Stereovision’ at Engineering Design Dept., **IIT Madras** (May - July 2010)
- ‘Optimization of Magnetic Abrasive Finishing Process using Breeding Swarm Optimization’ at Mechanical Engg Dept, **IIT Kanpur** (May - July 2009)

COMPUTER SKILLS

- *Operating Systems* : **Linux**, Windows
- *Languages* : **C++, Python, Javascript**
- *Packages* : Docker, Kubernetes, Torch, ROS2, MATLAB, AutoCAD, Solidworks, Basic Unity/UE/Blender, OpenCV, OpenPCL.

EXTRA-CURRICULAR ACTIVITIES

Sports / Other relevant informations:

- Parade Commander, Awarded Best Cadet at the inter-college National Cadet Corps.
- Driving: Yes.
- Willingness to Travel: Yes!
- Hobbies: Swimming, Reading
- *Languages*: Fluent in English, Tamil and conversational Hindi