Vishal Gattani

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Education

University of Maryland College Park, MD — Anticipated May 2023
Master of Science, Systems Engineering — 3.762/4 CGPA

International Institute of Information Technology, Bangalore (IIIT-B) — Aug 2015 – Sept 2020
Integrated Master of Technology, Electronics and Communication Engineering — 3.54/4 CGPA

Research and Internship

Graduate Research Assistant — Nov 2021 – Present
Simulation-based System Design Lab (SBSDL), UMD — College Park, MD

- Aim to build assurance cases for simultaneous verification and validation through multi-robot simulation.
- Using Scenario descriptive languages to yield concrete scenes within Unity which can be simulated to produce training or testing data to further improve development and operational testing.
- Implemented features within the ground autonomy Unity simulator to enhance simulation capabilities.

Research Associate — Oct 2020 – July 2021
Surgical and Assistive Robotics Lab (SARL), IIIT-B — Bangalore, India

- Experimented with depth cameras such as Microsoft Kinect V2 and Azure Kinect for analyzing and comparing efficient human motion capture.
- Integrated a dual-arm robotic system for biomimetic control via Motion Capture using Microsoft Kinect Azure.

Summer Intern — May 2018 – July 2018
Mercedes-Benz Research & Development India — Bangalore, India

- Developed an RL-based HVAC Optimization responsible for maintaining the temperature of the electric vehicle.
- Developed a software tool for compiling and sorting information to prepare source data for computer entry.

Publications

V. Gattani and M. Rao, (2021), "An integrated system design interface for operating 8-DoF robotic arm", Published in 2021 ICCAS.

Academic Projects

Path Planning of Point/Rigid Robots - Dijkstra, A*, RRT, PRM algorithms to search and execute a robot's path to a destination.
Self Replicating Robot System - Modelling, V&V to determine performance and reliability of different configurations of a self-replicating robotic system.
Kinematic Control of an 8-DoF biomimetic robot arm - Used Blender Game Engine to visualize, program, and control upper-limb motion .
Sign Language Detection - Used Mediapipe and LSTM to detect real-time gestures.
Real-time Human MoCap - Developed a graphical interface to replicate human motion using Blender Game Engine with Mediapipe and Microsoft Kinect.
Image Processing - Image Filtering, Point feature detection and matching, Visual Odometry
Scene Graph using OpenGL - Development of hierarchical models, rendering/integration with OpenGL, shader programming - vertex and fragment shaders.
LASER Communication System - Designed an electronic circuit to transmit and receive audio signals using laser diodes and photo-resistors respectively.
RadArduino - Designed a 2-Dimensional Radar using Ultrasonic Sensors and an Arduino microcontroller.

Technical Skills

Languages: Python, C++, C
Software: Blender Game Engine, Unity, OpenGL, MATLAB, LaTeX, LTSpice, MultiSIM, Arduino, Processing, Cameo Systems Modeler
Developer Tools: ROS, Github, VS Code
Operating Systems: macOS, Windows, Linux