Vishal Gattani

7700 Adelphi Rd, Apartment 23, Hyattsville, MD 20783
Phone: +1(480) 376 3397 | vgattani@umd.edu
https://github.com/vishalgattani | https://www.linkedin.com/in/vishal-gattani-71692611a/

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

- Employed scenario descriptive language for Unity simulator to probabilistically generate scenarios for rapid operational development and testing.
- Implemented features to evaluate the simulator's capabilities and limitations in diverse situations and conditions.

Master's Thesis — Jan 2023 – April 2023
Experimental Design using Bayesian Network Simulation-based Assurance Cases, UMD — College Park, MD

- Executed a Bayesian framework to determine experimental designs to improve assurance cases.
- Performed Design of Experiments to achieve parameters to increase belief in the system's capabilities.

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

- Analyzed human motion capture with Microsoft Kinect V2 and Azure Kinect to achieve efficient motion capture.
- Managed a team to develop a dual-arm robotic system through depth cameras for biomimetic control.

Publications

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

Academic Projects

Self-Driving Car Sim - Created a simulator incorporating a Hybrid A* path-finding algorithm, combined with a PID controller, using Voronoi Field and Euclidean distance as heuristics for self-driving cars.

Robot Path Planning - Implemented Dijkstra,A*, and RRT for holonomic and non-holonomic robots.

3D PRM for UAVs - Generated a 3D trajectory for UAVs using Probabilistic roadmaps to generate collision-free paths by representing a dense urban environment as a probabilistic graph.

Humanoid Arm teleoperation - Created a teleoperation system to visualize, program, and control upper-limb motion in real-time through Motion Capture with a precision of 0.1° using Blender. | *Video*

Sign Language Detection - Designed a gesture recognition system for ASL using Mediapipe and LSTM models to detect real-time gestures.

Stereo Disparity - Estimated pixel-wise depth by computing Disparity Map using sliding-window approach.

SfM - Reconstructed a 3D scene and simultaneously obtained the camera poses from a given set of images using their feature points correspondence.

Lane Detection - Detected lanes using a curve fitting approach and estimated road curvature.

Scene Graph - Created hierarchical models with scene graphs to optimize rendering and improve object management.

Technical Skills

Languages: Python, C++, C
Software: Blender, Unity3D, OpenGL, MATLAB, LTSpice, MultiSIM, Arduino, Cameo Systems Modeler
Developer Tools: ROS, Git, VS Code, Processing
Operating Systems: macOS, Windows, Linux
Deep Learning Architectures: LSTM, UNet.