ASHISH SUKUMAR

+1 (508) 502-8692 asukumar1@wpi.edu
github.com/Yami1106 Portfolio: yamiportfolio.netlify.app

PROFESSIONAL SUMMARY

Software Engineer with strong foundations in algorithms, systems design, and machine learning. Experienced in C++ and Python development, high-dimensional search algorithms, and deep learning architecture implementation.

TECHNICAL SKILLS

Languages: C++, Python
Core: Data Structures, Algorithms, Object-Oriented Programming
Algorithms: A*, Sampling-Based Planning, Kinodynamic Search
Machine Learning: CNNs, ResNet, DenseNet, ResNeXt, HomographyNet
Computer Vision: Homography Estimation, Camera Calibration, RANSAC
Tools: Git, Linux

EDUCATION

M.S. Robotics Engineering 2025–Present
Worcester Polytechnic Institute GPA: 4.00/4.00

B.Tech Computer Science and Engineering 2021–2025
SRM Institute of Science and Technology CGPA: 9.54/10

PROJECTS

Sampling-Based Planning Library (C++)
- Implemented RRT, RRT*, PRM, PRM*, and AO-RRT from scratch
- Designed modular architecture separating state space, validity checking, and expansion policies
- Benchmarked planners on high-dimensional articulated systems

Deep Learning HomographyNet
- Built supervised and unsupervised homography regression models in PyTorch
- Implemented TensorDLT and Spatial Transformer Networks
- Trained on 50,000 synthetic image pairs; achieved 8.7 px validation MAE

Camera Calibration (Zhang's Method from Scratch)
- Implemented normalized DLT homography estimation
- Recovered intrinsic matrix from linear constraints
- Achieved 0.509 px RMS reprojection error after nonlinear refinement

Pb-Lite Boundary Detection
- Designed 112-filter bank and χ^2 texture gradient pipeline
- Outperformed Sobel/Canny by reducing texture false positives

EXPERIENCE

Junior Project Technical Assistant – e-Yantra IIT Bombay 2024–2025
- Developed simulation modules and embedded control software
- Created structured technical documentation pipelines