KartikPatath

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Field(s) of Interest

Perception, Localization and Mapping, Deep Learning, Robotic systems engineering

Education

Worcester Polytechnic Institute (WPI) MA, USA

Masters of Science in Robotics Engineering CGPA - 4/4 August 2019 - May 2021

Skills

Programming Python, C++

Other softwares PyTorch, Docker, GIT, ROS, OpenCV, OGRE, MATLAB

Experience

Velodyne Lidar | Computer Vision engineer Aug.2021 - March.2022

3D Lidar Perception

- Worked on 3D-object tracking and prediction along with occupancy estimation for Vella Development Kit (VDK),used for ADAS applications and autonomous driving

Honda Research Institute, USA | Robotics Research Intern Feb. 2021 - May 2021

Curiosity based SLAM

- Worked on curiosity based mapping and navigation in unknown environment, targeting indoor spaces. Benchmarked on custom developed A-star variant

NASA, Jet Propulsion Lab, Team COSTAR | JVSRP Intern Aug. 2020 - Jan. 2021

Perception of Sub-Terranean robots

- Developed an artifact localization method which uses camera and lidar fusion to accurately report artifact locations on the fly, used in the final stage of the DARPA SubT competition 2021

Worcester Polytechnic Institute | Research Assistant Sep. 2019 - Aug. 2020

Semantic SLAM

- Integrated system for performing semantic-level SLAM, including semantic object detection, data association,and loop detection based on semantic objects.

Carnegie Mellon University, Robotics Institute, Biorobotics Lab | Summer Intern May. 2017 - Aug. 2017

DYNAMIC TEXTURE MAPPING OF 3D MODELS FOR STIFFNESS MAP VISUALIZATION

- Developed an Rviz (ROS vizualizer) plugin for dynamic texturing which augments textures to 3D models in real-time, used texture mapping and projective geometry for the backend

VISION SYSTEM FOR A MODULAR 6-LEGGED ROBOT

- Developed a vision system with intel realsense and hokuyo lidar for a 6-legged robot. Also, Implemented RGBD and Monocular SLAM

Projects

Motion Forecasting for Autonomous Vehicles using Argoverse Dataset Jan 2020 - April 2020

- Trajectory prediction of an AGV using LSTM Encoder-Decoder and Social ways GAN on the Argo AI motion forecasting dataset

Curiosity-Driven Exploration Oct 2019 - Dec 2019

- Implemented Intrensic Curiocity Module and Random Network Distillation for MineRL Navigation Challenge, NeurIPS 2019

Multi-focal image fusion using deep Convolutional Neural Networks Sept. 2017 - May 2018

- CNN based image fusion approach using Siamese network architecture to compute the fusion mask for a pair of multi-focal images

Publications

- Qian Zhentian, **Kartik Patath**, Fu, Jie and Xiao Jing, “Semantic SLAM with Autonomous Object-Level Data Association”, research paper in IEEE International Conference on Robotics and Automation, ICRA 2021.(accepted)
- **Kartik Patath**, R. Arun Srivatsan, Nicolas Zevallos and Howie Choset, “Dynamic Texture Mapping of 3D models for Stiffness Map Visualization”, poster presentation in the workshop on Medical Imaging at the IEEE/RSJ International Conference on Intelligent Robots and Systems, IROS 2017.
- **Kartik Patath**, Hadi Salman and Howie Choset, ”Visual system for a Modular 6-Legged robot”, research paper and poster in vol.5, pages 138-141, Robotics Institute Summer Scholars Journal 2017.
- Nicolas Zevallos, R Arun Srivatsan, Hadi Salman, Lu Li, Jianing Qian, Saumya Saxena, Mengyun Xu,**Kartik Patath** and Howie Choset, ”A surgical system for automatic registration, stiffness mapping and dynamic image overlay”, The International Symposium on Medical Robotics, ISMR 2018.
- N. Zevallos, R. A. Srivatsan, H. Salman, L. Li, J. Qian, S. Saxena, M. Xu, **K. Patath** and H. Choset, ”A Real-time Augmented Reality Surgical System for Overlaying Stiffness Information”,in proceedings of Robotics: Science and Systems, RSS 2018.

Patents

05 May, 2017	**Humanoid Robot**, Application Number 201721015920	India
22 Dec, 2016	**Robotic Cleaning System**, Application Number 201621043891	India

Achievements & Awards

2017	**Summer Scholar**, Robotics Institute Summer Scholars Program	Pittsburgh, PA
2017	**Scholarship**, Federation of Indian Chambers of Commerce and Industry (FICCI)	Pittsburgh, PA

Coursework

- Deep Learning, WPI
- Reinforcement Learning, WPI
- Computer Vision, WPI
- Advance Robot Navigation, WPI
- Robot Dynamics, WPI
- Introduction to Computer Vision, Udacity
- CS231n:Convolutional Neural Networks for Visual Recognition , Stanford

Extracurricular Activity

- Teaching Assistant for ECE 2312 - Discrete-time Signals and Systems.
- Teaching Assistant for ECE 3311 - Principles of Communication Engineering.
- Teaching Assistant for ECE 2019 - Sensors, Circuits and Systems.
- Peer reviewer for RISS 2017 journal.
- Creative head of the departmental council, in the Electronics and Communication department.
- Vice-Chairman of my institute’s Robotics Lab, IvLabs, from 2016-2017.
- Mentored a team of four sophomores, the team was among the quaterfinalists of Texas Instruments Innovation Challenge 2016.
- Conducted workshops in my institute on topics such as Image processing, Microcontroller programming and Circuit designing.