

Summary

I joined Omron Research as their 4th employee and have worked on a wide range of research projects mainly focused on Motion Planning and Bin Picking for Industrial Robots. At Omron I pushed for the creation of Software Development Standards and created rules for Code Reviews and Code Quality standards, helping us deliver clean, tested and working code on time. Before joining Omron, I spent 2 years at LL4MA Lab working on Deep Learning for robotic manipulation tasks.

I pride myself in delivering clean and maintainable code while iterating quickly. I am passionate about using technology to find solutions to our growing social needs.

Skills

Languages: C++, Python, MATLAB

Tools: PCL, ROS, Gazebo, OpenCV, Tensorflow, Keras, Jenkins, Docker

Robots: Omron Adept Robots, KUKA LBR4+, Rethink Robotics Baxter, SimLab's Allegro Hand

Experience

Omron Research Center of America (ORCA)

Robotics Software Engineer

November 2018 – Present

- ▷ Designed and developed a real-time middleware in QNX for reactive robot control
- ▷ Developed test framework for an end-to-end random bin picking pipeline
- ▷ Worked on development of fast Motion Planning Algorithms based on RRT, EET and DPRM
- ▷ Created standards and guidelines for code reviews and code quality
- ▷ Championed development of in-house Jenkins CI infrastructure, now used by 4 teams

Learning Lab for Manipulation Autonomy (LL4MA Lab), University of Utah

Graduate Research Assistant

August 2016 – 2018

- ▷ Built a fast object detection and tracking pipeline, which is used by multiple teams in the Lab.
- ▷ Implemented Grasp Controllers and end-to-end Grasping Pipelines with motion planning and execution.
- ▷ Created and maintained a ROS wrapper for Blensor, a kinect camera simulator with realistic error models

Education

University of Utah, Salt Lake City, Utah

Master of Science in Mechanical Engineering

Aug 2016 – Aug 2018

BMS College of Engineering, Bangalore, India

Bachelor of Engineering in Mechanical Engineering

Sept 2011 – May 2015

Relevant Coursework: 3D Computer Vision, Artificial Intelligence, Convex Optimization, Intro to Robotics, Intro to Robot Control, Motion Planning, Machine Learning, Probabilistic Modeling, and System Identification.

Publications

“Planning Multi-Fingered Grasps as Probabilistic Inference in a Learned Deep Network”; Qingkai Lu, **Kautilya Chenna**, Balakumar Sundaralingam, Tucker Hermans; *International Symposium on Robotics Research (ISRR)*, 2017. [PDF] [CODE]

Selected Projects

Object Detection and Segmentation in Point Cloud data using PointNet

January 2018

- ▷ Trained modified **PointNet** model on **YCB object dataset** and **BigBird dataset**.
- ▷ Model runs at **24 fps** on a NVIDIA GeForce 1060 GPU with an accuracy of 88.3%.

Grasp Collision detection using Convolutional Neural Networks

Ongoing

- ▷ Developed a CNN model to detect collisions btw robot and environment using PointClouds and JointState.
- ▷ Model classifies collisions with an **accuracy of 84.7%** and is ~30% faster than FCL.

Video Action recognition using Deep Learning

October 2017

- ▷ Implemented a **Bi-Directional LSTM Model** on **VGG16** Net using Keras to classify actions in scenes.
- ▷ Achieved a Mean Average Precision of **15.7 mAP** compared to the State of the Art of 21.4 mAP.

Autonomous Grasp Inference and Execution using Baxter and KUKA lwr4 Robots

January 2017

- ▷ Designed an end-to-end grasping pipeline to grasp objects on a table autonomously.
- ▷ Training data was collected in Gazebo simulation and tested in real world. [ISRR 2017]

Others: Motion Planning: TrajOpt, RRT and Variants, RealTime RRT*; Image Segmentation with GMM, Image De-noising using MRF;

Links

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