

Summary

I joined Omron Research as their 4th employee and have worked on a wide range of research projects mainly focused on Optimization for Motion Planning and Control. Before joining Omron, I spent 2 years at LL4MA Lab working on Deep Learning for robotic manipulation tasks.

I focus on 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 and k8s

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

- ▷ Developed test framework for an end-to-end random bin picking pipeline
- ▷ Designed and developed a real-time middleware for reactive robot control
- ▷ Created standards and guidelines for code reviews and code quality
- ▷ Built and maintained Jenkins CI infrastructure used by 4 teams
- ▷ Saved the organization >\$150k by reviewing and selecting an opensource alternative to a commercial product

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

Website: <https://chenna.me> **Linkedin:** [kautilyachenna](#) **Github:** [hashb](#)