Daksh Dhingra

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SUMMARY

- 2+ yr experience with coding in C++, 3+ yr experience with coding in Python.
- Looking for summer internship opportunities in Computer Vision and Robot perception for summer' 2021.
- Completed coursework and certifications in Deep learning, Mobile Robotics, Reinforcement learning, robot manipulation, Motion planning, and Probabilistic robotics.
- Experienced in deep learning frameworks- PyTorch and TensorFlow

EDUCATION

University of Washington, Seattle, USA — Jan' 20 - Jun'23 (expected)
PhD ME-Robotics — **GPA-4.0/4.0**

University of Washington, Seattle, USA — Aug'18- Dec'19
M.S ME-Robotics — **GPA-3.8/4.0**

YMCA University of Science and Technology, Faridabad, India — July' 11- July' 15
BTech in Mechanical Engineering — GPA- 7.9/10

EXPERIENCE

Robot Learning Intern, Honda Research Institute (HRI), Santa Clara, CA — Jan' 21- Mar' 21

Coding languages: Python. Framework: Pytorch

- Worked on real time object pose prediction problem with YCB dataset. This can serve as a big improvement for current manipulation problems for in-home robotic companions, at supermarkets and factory warehouses.

Deep Learning Intern, Volvo cars, Mountain View — June' 18- Sept' 18

Coding languages: Python, Javascript, and HTML. Framework: Flask, TensorFlow

- Developed an image annotation software, implemented classical computer vision techniques like superpixel segmentation and DBSCAN.
- Applied supervised active machine learning to the software which will retrain the model after every subsequent annotated frame making better pre-proposals. Object detection is implemented using a **Feature pyramid network** with a 13 layered Deep-RCNN backbone.

Research Assistant, Insect Robotics Laboratory, University of Washington — Dec'18- Sept'19

Coding languages: MATLAB/SIMULINK

- Build an automatic trimming device for calculating trim values for a flapping wing micro air vehicle.
- The robot used weighs 120mg with manufacturing and assembly in house. The control loop is programmed in SIMULINK-Realtime.
- Currently working on a stochastic controller for agile maneuvering of these robots.

Assistant Manager at National Engineering Industries, Jaipur, India. — July'15 -July'17

- Programmed automation of grinding machines, hydraulics presses, conveyors, and their communication with industrial robots on PLCs.

RELEVANT PROJECTS

Motion planning on Home Exploring Robotic Butler (HERB) (Software: Python) — Autumn 2017

- Implemented motion planning algorithms like A*, RRT*, lazy SP, lazy A*, and BIT* and compared them on the basis of their path lengths and computation time in 2D and 7D configuration space.

Black box rollouts prediction using Gaussian Process (Python) — Spring 2020

- Implemented a gaussian process-based dynamic model predictor with online learning of kernel scales and noise variances. The predicted mean closely followed the experimental trajectory of the robot with minimum variances.

CNN based architecture for predicting steering angle of self-driving cars (Python, TensorFlow) — Winter 2017

- Achieved 7.5 degrees of mean error in angle approximation of steering wheel based on the visual input of the road. Batch Normalization and dropout layers are used in the 10 layered CNN architecture with Adam optimizer and a learning rate of $1e^{-3}$ on TensorFlow.

Instrument detection in songs using CNN (Python, PyTorch) — Autumn 2019

- Accomplished 80% accuracy in the classification of the musical instruments used in a song. MEL spectrogram of audio files is used for training and testing of a 10 layered CNN.

PUBLICATIONS

D.Dhingra, Y. M. Chukewad and S. B. Fuller, "A Device for Rapid, Automated Trimming of Insect-Sized Flying Robot", in 2020 IEEE Conference on Robotics and Automation (ICRA)

LANGUAGES/ FRAMEWORKS

Python, Matlab, SIMULINK, FORTRAN, C++, ROS, PyTorch, TensorFlow, OpenCV, OpenRave, mujoco-py