Jiarun Wei

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EDUCATION

Carnegie Mellon University **09/2020 – 05/2022**
Master of Science - Mechanical Engineering *Pittsburgh, PA*
Courses: Deep Learning, Computer Vision, Java for Application Programmer, Machine Learning

University of California, Berkeley **01/2019 – 12/2019**
Exchange Study - Concurrent Enrollment *Berkeley, CA*
Courses: Feedback Control of Legged Robots, Introduction to Control of UAV, Model Predictive Control

Dalian University of Technology **09/2016 – 06/2020**
Bachelor of Engineering - Mechanical Engineering *Dalian, CN*
Courses: C Programming, Fundamentals of Controls, Digital Circuits

EXPERIENCE

Motion Planning, Autox Inc | Company Website **06/2022 – Present**
Software Engineer *San Jose, CA*
- Developed traffic rule descriptors to formalize autonomous vehicle's behavior at traffic lights, stop signs, etc.
- Implemented the traffic light reasoner to infer occluded and unrecognized lights based on surrounding objects.
- Integrated interactive prediction's result into vehicle's decision to improve the safety of vulnerable road users.
- Developed the component to score and filter trajectories from learning based planner inspired by human.
- Implemented the data pipeline for a learning based method that optimizes the trajectory filtering parameters.
- Built an automatic evaluation system to classify and rank bad trajectories to accelerate the triage process.

Safe AI Lab, CMU | Demo **09/2021 – 05/2022**
Research Assistant *Pittsburgh, PA*
- Developed an autonomous delivery robot with Visual and Lidar perception by **C++** and **Python** in **Linux**
- Achieved stable localization by *FAST-LIO* algorithm with Solid State Lidar and Stereo Camera IMU in **ROS**

PROJECTS

Monocular Depth Prediction Using Self-supervised Learning | Project repo **04/2022 – 05/2022**
- Built and trained a 2D image depth prediction neural network in **PyTorch** based on self-supervised learning
- Improved the prediction stability by adjusting Graph Adjacency Matrices in Graph Convolutional Network
- Implemented an automatic data selection and image color augmentation algorithm for **KITTI** dataset

Webiste Development for ICRA Competition | Website **01/2022 – 03/2022**
- Developed a deliverable website for SeasonDepth Challenge Competition using **HTML**, recorded by **ICRA**
- Fulfilled the front end interfaces of registration, login and ranking page by customized **CSS** and **Bootstrap**
- Deployed the website on RDS server and associated it with a domain name to evaluate the participants' models

Zombies-Infection Game | Project repo **10/2021 – 12/2021**
- Implemented a third person shooting game based on Object Oriented Programming by **C++** and **OpenGL**
- Constructed super classes of virtual props with extensible methods as interfaces in convenience of inheritance
- Optimized the texture loading time during weapon switching based on a novel pointer management algorithm

Collision Check for Robot Arms | Project repo **11/2020 – 12/2020**
- Designed a safety region generation approach for robot arm collision check by **Python** and **MATLAB**
- Implemented a self-designed algorithm to solve the geometric parameters of the safety region based on SVD
- Developed a CAD software plugin to calculate and visualize the safety region of 3D objects in arbitrary shape

Emoji Prediction for Twitter Texts | Project repo **10/2020 – 12/2020**
- Constructed a deep learning pipeline for emoji prediction on twitter texts based on **CNN** and **LSTM** by **Keras**
- Applied the **Word2vec** and **GloVe** embedding algorithm to data prepossessing and feature encoding of texts
- Conducted data cleaning and word parsing based on statistical method to get rid of the irrelevant information

SKILLS

Languages: C/C++, Python, Java, JavaScript, Shell Script, HTML, MATLAB

Tool-kits: Abseil, Protobuf, Git, Bazel, PyTorch, LMDB, Wandb, Tensorboard, Numpy, Scipy, Latex

Environment: Linux, GNU GRUB, SSH, Vim, Emacs, ROS, Conda, Docker, CARLA