Kexin Shi

Zurich, Switzerland | +41 76 514 65 07 | kexin.shi@uzh.ch

EDUCATION

University of Zurich, Department of Informatics	Zurich, Switzerland
MSc Informatics	2020.9 - Now
Xi'an Jiaotong University, Faculty of Electronic and Information Engineering	Xi'an, China
BEng Computer Science and Technology	2016.9 – 2020.6
National University of Singapore, School of Computing	Singapore
Summer Research Student	2019.7-2019.8
University of Cambridge, Artificial Intelligence Winter Session	Cambridge, UK
Visiting Student	2019.1-2019.2
Shanghai Jiao Tong University, School of Electronic Information and Electrical Engineering	Shanghai, China
Summer School Student	2018.7

RESEARCH EXPERIENCES

UZH & ETHz Robotics and Perception Group: Learning Perception-Aware Agile Flight   2022.3 – 2022.10
- Proposed a method learn neural network policies that achieve perception-aware, minimum-time flight in cluttered environment.
- Developed a learning-by-cheating framework to distill knowledge from RL state-based teacher policy to vision-based student policy for mapping depth images to control commands directly.
- Summitted to ICRA 2023.

ETHz Computer Vision and Geometry Group: An Offline Python SLAM using COLMAP   2022.3 – 2022.6
- Leveraged the advantages of both COLMAP and ORB-SLAM and built an offline python SLAM using monocular camera, including keyframe selection, covisibility graph and loop closure to improve speed and alleviate scale drift.
- Conducted benchmarking experiments on TUM-RGBD and KITTI datasets to show ours achieve faster speed and better reconstruction results compared with COLMAP and ORB-SLAM2.

ETHz Robotics System Lab: Monocular Markerless 6D Pose Estimation of ANYmal   2022.3 - 2022.6
- Generated an accurate dataset containing RGB images, ground truth 6D pose of the based of ANYmal using Kalibr.
- Adopted EfficientPose model on the generated dataset to detect location and estimate 6D pose of ANYmal from RGB images.

UZH & ETHz Robotics and Perception Group: Efficient Processing of Events Data   2021.9 – 2022.2
- Compared 3D methods to explore spatial-temporal information of events data simultaneously, including point-based methods, voxel-based methods, and point-voxel methods.
- Adjusted the structure of point-voxel model to fit the event data, fused voxel features and point features effectively, and improved performance in classification task of N-Caltech 101 dataset and optical flow regression task of DSEC dataset compared with pure point-based and voxel-based methods.

Bachelor Thesis: Recommendation System of Social Events   XJTU, China   2020.1 – 2020.6
- Collected and processed users and social events data from Meetup website, established a heterogeneous information network based on large amounts of different types of data, constructed meta-paths to calculate the similarity between nodes in several ways.
- Realized the functions of recommendation user interest-oriented social events, social groups, and people with the same interests.

Research Assistant: Gesture Interaction of Rehabilitation Robot   CUHKSZ, China   2019.10 – 2019.12

- This project was awarded as an excellent product in the 21st China Hi-Tech Fair 2019.
- Implemented a rehabilitation robot which can improve the social and cognitive abilities of autistic children by recognizing their expressions, talking with them, interacting with them by gestures, etc.
- Took responsibility for gesture interaction, extracted joint data from Kinect sensor, built and ensembled GMM-HMM model and DNN-HMM model.

PROJECT EXPERIENCES

DLAD Course Project: Multi-task Learning for Autonomous Driving   ETHz, Switzerland   2021.3 – 2021.7

- Adopted DeepLabv3+ model and used multi-task learning (MTL) models to achieve semantic segmentation and monocular depth estimation jointly. Tried three architectures to achieve MTL: Joint architecture, Branched architecture, and architecture with self-attention modules.
- Analyzed and processed irregular lidar points and built a 2-stage 3D object detector to detect vehicles in autonomous driving scenes.

VAMR Course Project: Visual Odometry   UZH, Switzerland   2020.11 – 2021.1

- Implemented a monocular visual odometry pipeline including extracting feature points using different feature detectors, tracking keypoints with KLT or SIFT, estimating camera poses with P3P or DLT, triangulating landmarks, and optimizing with bundle adjustment.
- Tested the pipeline and visualized 3D landmarks and related camera poses on parking, KITTI and Malaga datasets. Finally got 0.5/0.5 bonus points.

Competitions and Honors

The 18th "Ascendas Cup" Extracurricular Academic Science and Technology Competition   2019.3

- Designed FPGA hardware for accelerating CNN framework and awarded the First Prize at university level.
- Adopted a PipeCNN model, explored data throughput and storage band width optimization strategies, and finally implemented image classification application using AlexNet on a FPGA comprehensive development board: ALTERA AX515.

The National Mathematical Contest in Modeling   2018.9

- Awarded the First Prize in the undergraduate group at national level.

University Academic Scholarships 3 years in a row   2016 - 2019