Xuedong ZHANG

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EDUCATION

Technical University of Munich   Munich, Germany
M.Sc. Mechatronics and Robotics   Apr. 2020 - Oct. 2023
Grade: 1.2

Hefei University of Technology   Hefei, China
B.E., Mechanical Design and Manufacturing and Automation   Sep. 2013 - July 2017
GPA: 3.62/4.3 (Ranking: 11/384)

WORK EXPERIENCE

Unilever (China) Co., Ltd.   Hefei, China
Quality Engineer   July 2017 - Apr. 2018

- Responsible for multiple quality projects such as the *Production Date Missing* project and the *Packaging Material Scratch* project.

- Enhanced the quality of products, e.g. reduced the occurrence of production date missing and scratches on the bottle body.

RESEARCH EXPERIENCE

Technical University of Munich   Munich, Germany
Master's Thesis (C++, Python, PyTorch, OpenCV)   Feb. 2023 - Sep. 2023
Understand Human-Object Interaction in Scene for Human-Robot Collaboration
Supervisor: Prof. Dr.-Ing. Darius Burschka
Advisor: M.Sc. Hao Xing

- Collected a new dataset for action recognition and segmentation.

- Constructed a real-time system for human-object interaction analysis. (Human pose recognition based on OpenPose, multiple object tracking based on YOLO and ByteTrack, action recognition and segmentation based on graph convolutional network (GCN).)

- Evaluated the constructed real-time system on the collected dataset, an accuracy of 73.93% and a processing speed of about 33 fps can be achieved.

- Presented this work at the Munich Robotics Fair Automatica 2023.

- After completing this thesis, an additional improvement based on the diffusion model was proposed.

Technical University of Munich   Munich, Germany
Semester Thesis (Python, OpenCV)   Apr. 2022 - Nov. 2022
A Robust Method for Joint Computation of Structure and Depth using Plane and Parallax
Supervisor: Prof. Dr.-Ing. Darius Burschka
Advisor: M.Sc. Hao Xing

- Motion detection using epipolar constraint and flow vector bound constraint.

- Estimated the depth of dynamic objects under a moving camera by using the structure from motion (SfM) algorithm and their relative scale based on the ground information.

- Modified the optical flow and the structure of dynamic objects using 3D information and the Plane and Parallax algorithm.

PROJECTS

Reproduced Papers   Munich, Germany
Self-learning (Python, PyTorch)   Apr. 2022 - now

- An Image is Worth 16x16 Words: Transformers for Image Recognition at Scale

- Two-Stream Adaptive Graph Convolutional Networks for Skeleton-Based Action Recognition

- Denoising Diffusion Probabilistic Models

- Diffusion Action Segmentation

- and other papers, etc.

Computer Vision   Munich, Germany
Course Project (MATLAB)   Apr. 2022 - Sep. 2022

- 4 tasks using MATLAB Grader, including implementing a Harris feature extractor, calculating image point correspondences between two images, estimating the essential matrix using the eight-point algorithm, and extracting all possible Euclidean movements (R, T) from the estimated essential matrix.

- A computer vision challenge, reproduced the paper work of Tour into the picture: using a spidery mesh interface to make animation from a single image. Developed a Matlab application that is capable of creating and visualizing different perspectives of a room based on a single image.

Practical Course MATLAB/Simulink for Computer Aided Engineering   Munich, Germany
Course Project (MATLAB)   Oct. 2021 - Mar. 2022

- Using toolboxes and solutions provided by MATLAB/Simulink to solve exercise tasks.

- Toolboxes, such as Simulink, Optimization Toolbox, Statistics and Machine Learning Toolbox, Symbolic Math Toolbox, Control System Toolbox, Simulink Control Design Toolbox, Stateflow Toolbox, etc. are included.

Mobility Data Analysis   Munich, Germany
Course Project (Python, Pandas)   Apr. 2021 - Sep. 2021

- Analyzed driving behavior and personal mobility data using Python (Pandas, GeoPandas).

- A machine learning project where GPS trajectory data was used to classify transportation modes (car, bus, bike, walk, etc.).

HONOURS & AWARDS

Outstanding Graduate	Provincial level, 2017
Outstanding Graduate	School level, 2017
The Second Prize Scholarship	School level, 2016
The First Prize Scholarship	School level, 2015
Excellent Student Cadre	School level, 2015
Merit Student	School level, 2015
The Third Prize Scholarship	School level, 2014

SKILLS

Programming Languages:	Python, C/C++, MATLAB
Frameworks:	PyTorch, OpenCV, CoppeliaSim
Languages:	**Native:** Chinese
	Fluent: English (C1 IELTS: 7), German (C1 DSH: 2)

HOBBIES

Reading books, Hiking, Playing chess