Yutian Han

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Born 4 February 1997, China

SUMMARY

Objective Seeking for a software engineering position in computer vision

Coding Languages **C++, Python, JAVA**

Technical Skills ROS, PyTorch, OpenCV, SLAM, Deep Learning, Visual-SLAM, Structure-from-Motion, Multi-View-Stereo, Neural Radiance, Dense 3D reconstruction, Depth Estimation

EDUCATION

10/2020 – 03/2023 **ETH, Zürich, Switzeland**

Master of Science in Robotics, Systems and Control

- One-year experience at AMZ Driverless for building an autonomous race car
- One and a half years of research at Computer Vision Lab

08/2019 – 05/2020 **University of Michigan, Ann Arbor, U.S.A**

Master of Science in Mechanical Engineering, final grade: **4.0 out of 4.0**

09/2015 – 05/2019 **Lafayette College, Easton, U.S.A**

Bachelor of Science in Mechanical Engineering, final grade: **3.94 out of 4.0**

WORK EXPERIENCE

07/2023 – present **Computer Vision Software Engineer, Hexagon,** *Heerbrugg, Switzerland*

Research and Implement Algorithms for 3D Vision Applications

- Developed and trained a **deep neural network-based** image feature detector and descriptor, achieving 30 percent higher recall in relative pose estimation than the SIFT descriptor
- Integrated **sensor fusion** of IMU, Cameras, GNSS and LiDAR for a versatile **SLAM** solution deployable across multiple devices and platform
- Explored techniques for accelerating computer vision utilizing NPU and GPU, including network quantization for edge AI devices
- Improved robustness of SLAM at the challenging agricultural environment by implementing dynamic object detection and lane detection for helping achieving autonomous driving

05/2020 – 08/2020 **Software Engineer, APTIV,** *Troy, Michigan, U.S.A*

Issue Triage and Microservices Development for Autonomous Driving Data Logs

- Developed algorithms to automate the triage of failed ADAS logs by analyzing camera streams and sensor fusion data to identify causes of failure
- Developed RESTful APIs and Microservices Pipeline to publish driving logs during autonomous vehicle testings using Java, Spring Boot, Spring Cloud
- Built **Data Ingestion Microservice** to accept, validate and pre-process raw input data from user and publish to RabbitMQ as data buffer and data broker for decoupling
- Designed and implemented Data Processor Microservice to **subscribe data from RabbitMQ**, convert data format, make REST call to Backup Service to securely syncarchive driving logs to AWS

06/2019 – 09/2019 **Full stack Developer, Le Wagon,** *Shanghai, China*

Web Application Development for an Automatic Charts Generation Pipeline

- Led a team to build a web application, BizWiz, which can extract tables from a given file and generate well-designed charts automatically
- Tutored students in frontend and backend design (Ruby, JavaScript, HTML, CSS)

RESEARCH AND PROJECTS

1/2022 – 06/2023 **Computer Vision Lab, ETH, Zürich, Switzeland,**

Large Scale 3D Dataset Reconstruction

- Implemented a **Structure-from-Motion** pipeline for driving sequences to obtain metric-accurate poses by incorporating **GPS data** into **bundle adjustment** (link)
- Developed a ground-truth depth dataset using **patch match stereo** methodology
- Improved the accuracy of the state-of-art **monocular depth estimator** by training MLP on the proposed dataset
- Implemented a **neural radiance field** pipeline that can synthesize innovative views for large scale outdoor scenes and leveraged the training of neural radiance to improve the coarse **instance segmentation**

10/2020 – 10/2021 **AMZ Driverless, ETH, Zürich, Switzeland,**

Software Engineer for Autonomous Driving

- Designed and built a driverless race car, that can beat an average human driver on a previously unknown track, to compete in various Formula Student events (link)
- Developed a robust and accurate estimation system to predict the vehicle speed and navigate the race car inside the track using **Kalman Filters and SLAM**
- Implemented and tested **EKF-SLAM, Graph-SLAM and Visual-SLAM** utilizing data from **IMU, camera and LiDAR**
- Designed and implemented **RESTful APIs** for users to create, retrieve and update **GNSS recordings** of formula student competition tracks

06/2016 – 09/2017 **North American Nanohertz Observatory for Gravitational Waves, Easton, U.S.A,**

Pulsar Timing and Data Analysis

- Processed data of pulsar timing and improved the process of signal calibration (Python)
- Improved the data accuracy by 10-15 percent, leading to a bigger chance of detecting gravitational waves

ACTIVITIES

05/2014 – 05/2016 CoFounded a nonprofit organization, DreamWeaver

- Helped high school students to pursue their dreams and education
- Invited graduates from top universities to speak in public seminars and mentor students

6/2014, 6/2015, 8/2018 Volunteer teaching in Qinghai, China

SCHOLARSHIPS AND HONOURS

08/2018 Tau Beta Pi Scholarship

- Granted to outstanding members of Tau Beta Pi, an engineering honor society that accepts the engineering students in the top 10 percent of their class

04/2018 Phi Beta Kappa

- An honour society that recognizes exceptional academic achievement in sciences

08/2016 Excel Scholarship at Lafayette College

- Honoured high-performing students to assist faculty members in research

SKILLS AND INTERESTS

Engineering tools Basic: Autodesk Inventor, ANSYS

Languages Chinese (Native speaker)
English (Full professional proficiency)
German (Level A2)

Interests Web design, Visual Arts, Astrophysics, Basketball