Zimeng Jiang

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Education

ETH Zürich Sept. 2019 - 2022 (expected)
MSc in Electrical Engineering and Information Technology, GPA: 5.6/6.0 *Zürich, Switzerland*

- Research Interest: Computer Vision, 3D Geometry, SLAM, Autonomous Driving
- Courses: Machine Learning, 3D Vision, Embedded Systems, Autonomous Mobile Robots

Beijing Institute of Technology Sept. 2015 – June 2019
B.Eng. in Automatic Control, GPA: 4.0/4.0, with distinction *Beijing, China*

Experience

Research Assistant, full-time Since June 2021
Computer Vision and Geometry Group, ETH Zürich *Zürich, Switzerland*

- Conducted research on robust visual SLAM using data of different modalities.

Research Intern, part-time Dec. 2018 – May 2019
Institute of Automation, Chinese Academy of Sciences *Beijing, China*

- Conducted research on facial micro-expression recognition.

Mitacs Globalink Research Intern, full-time July 2018 – Oct. 2018
Ontario Tech University *Oshawa, Canada*

- Designed an image-based visual servoing controller for pose regulation of autonomous robotic systems.

Projects

Deep Learning for Autonomous Driving | *Python, PyTorch* Mar. 2021 – June 2021

- Built a multi-task learning framework for semantic segmentation and depth estimation. Achieved the highest rank among 52 participated groups.

Learning a Better BAD-SLAM [Code][Presentation][Thesis] | *CUDA, C++, Python, PyTorch* Oct. 2020 – Apr.2021

- Semester thesis on robustifying bundle adjusted direct SLAM (BAD-SLAM) via deep learning and feature-metric optmization, supervised by Paul-Edouard Sarlin, Viktor Larsson, Martin Oswald, Marc Pollefeys.
- Enlarged the convergence basin of direct image alignment by *50%* by densely aligning invariant and compact features computed from a deep neural network trained with supervision on camera pose.
- Achieved *21%* higher AUC score compared with the baseline method and performed well on the ETH3D benchmark by integrating feature alignment into the front-end pose tracking and the back-end scene geometry optimization. Improved significantly the accuracy and robustness on common failure modes: illumination changes, inaccurate sensor calibration, fast motion, structureless and textureless scenes.
- Achieved real-time performance using C++ and CUDA.

Sparse-to-dense Feature-metric Localization [Code][Report] | *Python, PyTorch* Mar. 2020 – July 2020

- Enhanced the long-term localization accuracy on multiple cross-condition datasets by aligning robust and pixel-level accurate features as a post-processing step of a hierarchical localization scheme.

3D Human Pose Estimation [Code][Report] | *Python, PyTorch* Mar. 2020 – July 2020

- Designed a two-stage model to predict 3D human pose from a single RGB image. Achieved the highest PA-MPJPE score among 15 participated groups.

Skills

Technical: C/C++, Python (PyTorch), CUDA, Matlab, Linux, Git, LaTex
Languages: English (fluent), Chinese (native), German (beginner)