Yanqing Shen

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EDUCATION

Xi'an Jiaotong University Sep. 2019 ~ Present
Ph.D. Candidate of Institute of Artificial Intelligence and Robotics | Research with CAE Academician **Nanning Zheng** | Control Science and Engineering | GPA: 3.69/4.0 (88.8/100)

ETH Zurich Dec. 2023 ~ Dec. 2024
Visiting student at Robotic Systems Lab | Research with **Marco Hutter**

Xi'an Jiaotong University Sep. 2015 ~ Jun. 2019
Bachelor of Electronic and Information Engineering | Major: Automation | **GPA: 4.06/4.3 (93.2/100)**

RESEARCH INTERESTS

Research interests mainly include visual representation learning, place recognition, and autonomous driving.

ACADEMIC EXPERIENCE

Poster presentation at CVPR2023 academic conference, Canada, Jun. 2023.
Oral presentation at ITSC2019 academic conference, New Zealand, Oct. 2019.

MAIN PUBLICATIONS

- **Yanqing Shen**, Sanping Zhou, et al. "StructVPR++: Distill Structural and Semantic Knowledge with Weighting Samples for Visual Place Recognition", **T-PAMI 2025**
- **Yanqing Shen**, Turcan Tuna, Marco Hutter, et al. "ForestLPR: LiDAR Place Recognition in Forests Attentioning Multiple BEV Density Images", **CVPR 2025**
- **Yanqing Shen**, Sanping Zhou, et al. "StructVPR: Distill Structural Knowledge with Weighting Samples for Visual Place Recognition", **CVPR 2023**
- Ruotong Wang†, **Yanqing Shen**†, et al. "TransVPR: Transformer-based place recognition with multi-level attention aggregation", **CVPR 2022**. †: Equal contribution.
- **Yanqing Shen**, Ruotong Wang, et al. "TCL: Tightly Coupled Learning Strategy for Weakly Supervised Hierarchical Place Recognition", IEEE Robotics and Automation Letters (**RA-L**), 2022.
- Chao Xia, **Yanqing Shen**, Yuedong Yang, et al. "Onboard Sensors-Based Self-Localization for Autonomous Vehicle with Hierarchical Map", IEEE Transactions on Cybernetics (**T-CYB**), 2022.
- Wenjie Gao, Jiawei Fu, **Yanqing Shen**, et al. "Complementing onboard sensors with satellite map: A new perspective for HD map construction", **ICRA** 2024.
- Jiawei Fu, **Yanqing Shen**, et al. "InteractionNet: Joint Planning and Prediction for Autonomous Driving with Transformers", **IROS** 2023.

HONORS AND AWARDS

National Scholarship, Xi'an Jiaotong University, (2016, 2017, 2018, 2020, 2021, 2023), top2%
CMCC Scholarship, Xi'an Jiaotong University, 2024, top1%
Freshman Scholarship & Academic Scholarship, Xi'an Jiaotong University, 2019
Outstanding Undergraduate Graduates in Xi'an Jiaotong University, 2019
First Prize of Contemporary Undergraduate Mathematical Contest in Modeling in Shaanxi Province, 2017
Outstanding Student, Xi'an Jiaotong University, (2016, 2017, 2018, 2020)

RESEARCH EXPERIENCE

Nov. 2024 – Jan. 2024

LiDAR Place Recognition for Robots in Forests

Supervisor: Dr. Cesar Cadena, Dr. Olga Vysotska

- ✧ To improve the place recognition performance in Forests, which have similar scenes.
- ✧ Propose to use BEV density images to extract some unique features, representing the 2D geometric distributions of trees.

Jan. 2024 – Feb. 2023

Distill Structural and semantic Knowledge for VPR

- ✧ To further enhance semantic knowledge in RGB features and thus improve feature stability in a changing environment.
- ✧ Introduce the explicit label features into enhanced global features, thereby achieving better semantic alignment between image pairs.

Now – Sep. 2019

Autonomous Driving Vehicle Platform Development

- ✧ In Nov. 2019 and Nov. 2020, our team (Pioneer) won the championship in both **Intelligent Vehicle Future Challenge** competitions. Responsible for multi-sensing fusion localization algorithms.
- ✧ In Sep. 2022 and Nov. 2023, our team (Pioneer) won the championship in both competitions. As the team student leader, lead and manage the entire team to develop the autonomous vehicle system.

Nov. 2022 – Jan. 2022

Distill Structural Knowledge for VPR

- ✧ To enhance structural knowledge in RGB features and thus improve feature stability in a changing environment.
- ✧ Propose a sample-based selective knowledge distillation method to distill the high-quality knowledge from segmentation to RGB.
- ✧ Achieve SOTA performance using only global retrieval and even outperforms two-stage methods.

Nov. 2021 – Mar. 2021

Transformer-based Attention for VPR

- ✧ To adaptively select distinctive regions in an image with only image-level supervision.
- ✧ Propose a Transformer-based model that can jointly extract both patch-level and global image representations by aggregating multi-level attentions.

Oct. 2021 – Mar. 2021

Tightly Coupled Learning Strategy for VPR

- ✧ To tightly couple global and local descriptors thus improving the global perception capability, enriching local details, and improving their consistency.
- ✧ Propose a bidirectional search DTW method with path assumptions to mine spatial information.

SKILLS

Languages: English (CET-6 544), Mandarin Chinese

Techniques: Python, C++, MATLAB, Visio

PROFESIONAL SERVICES

Reviewer CVPR, ECCV, ICCV, ICRA, RA-L, IROS, ACCV, ICPR, ITSC, and IV