WEI CAO

Karl-Köglsperger-Str.9, 80939 Munich, Germany
04 August 1997 | China
wei.cao@tum.de | +49 163 144 1555 | www.linkedin.com/in/wei-cao-dave
My research interests focus on autonomous driving and 3D computer vision.

EDUCATION

Ph.D. of Informatics   Mar. 2024 – Present
Bosch Center for Artificial Intelligence (Stuttgart, Baden-Württemberg, Germany)

Ph.D. of Informatics   Mar. 2024 – Present
University of Stuttgart (Stuttgart, Baden-Württemberg, Germany)

M.Sc. Robotics, Cognition, Intelligence (Computer Science)   Oct. 2021 – Mar. 2024
Technical University of Munich (TUM, Munich, Germany)

B.Sc. Electrical and Computer Engineering   Oct. 2018 – Sep. 2021
Technical University of Munich (TUM, Munich, Germany)

PUBLICATION

(CVPR 2024) Motion2VecSets: 4D Latent Vector Set Diffusion for Non-rigid Shape Reconstruction and Tracking
Wei Cao[*], Chang Luo[*], Biao Zhang, Matthias Nießner, Jiapeng Tang

- [*] These authors contributed equally to this work

What Matters to Enhance Traffic Rule Compliance of Imitation Learning for Automated Driving
Hongkuan Zhou[*], Aifen Sui[*], Wei Cao[*], Letian Shi

- [*] These authors contributed equally to this work
- Submitted to ECCV Workshop 2024

RESEARCH AND PROJECTS

Deformable Object Reconstruction and Tracking using Diffusion Models
TUM, Munich, Germany   *Apr. 2022 – Feb. 2023*

- Expand the dimensionality of the original Diffusion Prior to 4D, resulting in increased accuracy and the generation of novel dynamic human motion sequences
- Devise a new approach to parameterize the latent codes by imposing latent sphere regularization, which improves the efficiency of the model and further increases accuracy

What Matters to Enhance Traffic Rule Compliance of Imitation Learning for Automated Driving
Huawei Technologies Duesseldorf GmbH, Munich, Germany   *Dec. 2022 – Jun.2023*

- Developed P-CSG, enhancing End-to-End Autonomous Driving performance, achieving a 15% improvement in driving scores
- Addressed interpretability and safety in autonomous driving, proving increased robustness against adversarial attacks

Next Best View with Implicit Neural Representation
Italian Institute of Technology(IIT), Genova, Italy   *Apr. 2022 – Sep. 2022*

- Developed a new dataset comprising 20k sets of images for Next-Best-View (NBV) planning based on a SLAM architecture with implicit neural representation (NeRF)

- Enhanced the accuracy of NBV planning from 40% to 56% through data augmentation and data balancing

3D Visual Grounding as Sequence Modelling

TUM, Munich, Germany   *Apr. 2022 – Sep. 2022*
- Localized the bounding box of the target object through two corner vertices
- Formulated the visual grounding as a sequence prediction problem using a new method
- Propelled a novel neural architecture with Point Transformer as the backbone

Modeling Localness for Transformer in Speech Recognition

TUM, Munich, Germany   *Feb. 2021 – Jun. 2021*
- Implemented a diagonal Gaussian mask with learnable parameters to Transformer, highlighting the significance of the local dependency
- Enhanced the network through the local mask, reducing the average Word Error Rate (WER) from 12.4% (Baseline) to 12.2% (My network)

Car Simulator

BMW AG, Munich, Germany   *Sep. 2020 – Feb. 2021*
- Build the connection between the virtual key in the phone and the Car Simulator App via BLE (Bluetooth Low Energy)
- Serialized the buffer stream sent from the virtual key and de-serialized it to readable contexts in the car simulator via Google Protocol Buffers
- Developed a minimum viable product (MVP) which received positive feedback from potential customers during product demonstrations

WORKING EXPERIENCE

Huawei Technologies Duesseldorf GmbH (Munich, Germany)

Working Student   *Dec. 2022 – May. 2023*
- Research and identify cutting-edge machine learning solutions/technologies for end-to-end autonomous driving with a focus on security
- Improve state-of-the-art solutions and facilitate the transfer of theoretical research concepts into practical products for future Huawei developments

Technical University of Munich (TUM, Munich, Germany)

Teaching Assistant   *Apr. 2022 – Apr. 2023*
- Design and deliver tutorials for the course *Introduction to Deep Learning* and mentor students on programming tasks, e.g., semantic image segmentation
- Collaborate with fellow tutors to draft and correct exam papers for over 1,300 students

BMW AG (Munich, Germany)

Intern for On-Demand Mobility   *Sep. 2020 – Feb. 2021*
- Developed a Java-based vehicle simulator/mock-up App as an interface for demonstrating car-sharing vehicle technology via Bluetooth Low Energy
- Independently tested operation-relevant features of the latest car-sharing generation (CS4), including detailed tracking, documentation, and evaluation of results

Skills

Programming Languages: Python (NumPy, pandas, PyTorch), C, Java
Languages: Chinese (Mandarin, native), English (C1, IELTS-7), German (C1)
Developer Tools: Git, VS Code, Matlab, MS Office
Driving License: Germany (Class B), China (Class C1)
Interests: Guitar, Snowboarding (Casi Level 1 Instructor), Table Tennis