Kenan LI

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EDUCATION

Southern University of Science and Technology(SUSTech) *Sep 2019 - Jun 2022*
M.S. in Electronic Science & Technology
North China Electric Power University(NCEPU) *Sep 2015 - Jun 2019*
B.S. in Electrical Engineering & its Automation

PUBLICATIONS

(*Equal contribution)

Z. Chen*, **Kenan Li***, X. Yang, T. Jiang, Y. Li, H. Zhao, "TrackOcc: Camera-based 4D Panoptic Occupancy Tracking." (Submitted to 2025 IEEE International Conference on Robotics and Automation (ICRA)).

Y. Li, S. Li, X. Liu, M. Gong, **Kenan Li**, N. Chen, Z. Wang, Z. Li, T. Jiang, F. Yu, *et al.*, "Sscbench: A large-scale 3d semantic scene completion benchmark for autonomous driving," *arXiv preprint arXiv:2306.09001*, 2023 (Accepted by IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2024)

X. Guo, S. Ding, T. Peng, **Kenan Li**, and X. Hong, "Robot hearing through optical channel in a cocktail party environment," *Advanced Intelligent Systems*, vol. 5, no. 1, p. 2 200 143, 2023. [Online]. Available: https://onlinelibrary.wiley.com/doi/10.1002/aisy.202200143

EXPERIENCE

Test-Time Adaptation (TTA) on 3D Semantic Scene Completion September 2024 - now
Research Intern, supervised by Prof. Hang Zhao *MARS Lab, Tsinghua University*

Aimed to realize a TTA framework for camera-based autonomous driving, enhancing perception in out-of-distribution environments.

- Adapted the classic camera-based TPVFormer to streamline the TTA framework.
- Implemented a novel pseudo-label generation pipeline, allowing the model to adjust during inference.

Spatial-Temporal Understanding in Autonomous Driving March 2024 - September 2024
Research Intern, advised by Prof. Hang Zhao *MARS Lab, Tsinghua University*

Defined a 4D panoptic tracking task and proposed the state-of-the-art solution, TrackOcc.

- Made the first attempt to explore the task of jointly addressing occupancy panoptic segmentation and object tracking using camera input.
- Proposed TrackOcc, utilizing 4D panoptic queries to perform in a streaming, end-to-end manner. Introduced a localization-aware loss to enhance tracking performance.
- TrackOcc achieved state-of-the-art results on the Waymo dataset.

Database for Simultaneous Localization and Mapping (SLAM) Task June 2023 - Now
Research Intern, advised by Prof. Chen Feng *AI4CE Lab, New York University*

Developed a storage framework for SLAM tasks using the database, aiming to achieve efficient querying in various storage environments.

- Designed storage framework according to the data structure and workflow of SLAM tasks.
- Implemented versions for both single robots and robot groups.

3D Semantic Scene Completion Benchmark March 2023 - June 2023
Research Intern, advised by Prof. Chen Feng *AI4CE Lab, New York University*

Offered an outdoor scene completion benchmark for evaluations of cutting-edge algorithms.

- Coded to convert a labeled point cloud dataset into a voxel-based dataset as ground truth.
- Aggregated multi-frames to make labeled point clouds denser, avoiding the moving objects shifting.

Kaggle Data Science Competition (BirdCLEF 2022) February 2022 - May 2022
Individual Project *SUSTech*

Designed and implemented a classification algorithm used densenet121, to identify bird species by sound. Bronze medal (11%) (the highest rank increase (303) on the private leaderboard).

- Preprocessed the bird sound using FFT spectrum and MFCC (Mel Frequency Cepstrum Coefficient), added pink noise to increase generalization.
- Designed and used weighted loss function to solve the data imbalance problem.
- Designed and trained a model based on densenet121 to classify the sound in time and frequency domains.

Laser microphone and signal optimization algorithm July 2020 - September 2021
Group member, advised by Prof. Xiaoping Hong *ISEE Lab, SUSTech*

Developed a laser microphone, avoiding noise using the light channel, hoped to solve the cocktail party problem.

- Reviewed the literature and implemented a laser optical lens group and low-pass analog filters.
- Collected a corpus with 600 sentences and removed the ambient optical noise using spectral subtraction.
- Developed a denoising model to restore high-frequency vibration received from throat skin (the signal mainly contains the low-frequency vibration from by vocal cord), trained in MFCC and time domains.

Target plant detection algorithm February 2020 - June 2020
Group member, advised by Prof. Xiaoping Hong *ISEE Lab, SUSTech*

Made a module for an agricultural SLAM robot designed to assess the health of the target crop. The module achieved an accuracy of 87% on crop detection.

- Collected 100 pictures of the maize plant.
- Zooming and rotation were used to expand the data set size.
- VGG-16 neural network is transferred and trained on the data set.

State evaluation of generator rotor based on machine learning January 2019 - June 2019
Undergraduate Researcher, advised by Prof. Junqing Li *NCEPU*

Applied LSTM (Long Short-Term Memory) algorithm to time series sensor data from the power plant to develop a health evaluation model for the rotor of a synchronous generator.

- Preproccessed the data through visualization, standardization, and dimension reduction.
- Selected key items for health state representation, considering heat conduction theory and sensor placements.
- Designed an LSTM-based model to predict healthy state values as the reference for future state thresholds.

TEACHING & LEADERSHIP EXPERIENCE

- SDM242, Teaching Assistant; SUSTech Da Vinci Challenge Camp, Coach, SUSTech
- Aircraft Club, Group Leader, NCEPU

HONORS & AWARDS

Honors & Scholarship

- 3rd prize, Excellent Teaching Assistant 2021
- Scholarship, SUSTech; Excellent Coach 2019
- Outstanding graduates in NCEPU 2019
- Siyuan Electric Power Scholarship 2018

Competition Awards

- National Class, Rated Excellent, College students' innovation and entrepreneurship training program 2018
- National 3rd Prize, China Robot Competition (FIRA Simulation Group, robot soccer) 2017
- National 2nd Prize, Bridge+ (National Youth Business Simulation Contest) 2016

TECHNICAL STRENGTHS

Programming languages	C/C++, Python, R, SQL, C#, Java, Javascript, HTML
Databases and Tools	Microsoft SQL, Redis, MongoDB, Matlab, TensorFlow, PyTorch, Latex, Synopsys, LabVIEW