Yueyuan Sui

https://luckyms.github.io/

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EDUCATION

Northwestern University — Evanston, IL
Master of Science in Electrical Engineering; GPA: 4.00 / 4.00 — *Sept. 2022 – Jun. 2024*

Chung Yuan Christian University — Taoyuan, Taiwan
Bachelor of Science in Electrical Engineering; GPA: 3.858 / 4.00 — *Sept. 2017 – Jul. 2021*

RESEARCH EXPERIENCE

- **Effect of Attention and Self-Supervised Speech Embeddings on Non-Semantic Speech Tasks**
  Co-author, IDEAS Lab, Northwestern University, advised by Prof.Qi Zhu — *Apr. 2023 - Oct. 2023*
  - Recognized nine different emotions from audio signals, and calculated the perceptibility score for each emotion separately
  - Used different large language models suitable for non-semantic tasks for feature exploration
  - Used the technique of Padding and Masking to handle varying sequence length
  - Designed different network architectures combining CNN, LSTM, and Self Attention to realize emotion perception

- **Enhance 3D model generation with relevant but non-provided information**
  Graduate Researcher, IDEAS Lab, Northwestern University, Advised by Prof.Qi Zhu — *Jul. 2023 - Now*
  - Designed a framework that converts input textual information into 3D model as output without requiring paired text and 3D shape training data
  - Used contrastive Language-Image Pre-training to retrieve relevant words from the images obtained by rendering the dataset and utilized them to generate pseudo captions to help with model training
  - Currently applying the input textual information to generate some relevant modality, such as geometric and texture information, and using the generated relevant modalities as input of the framework along with the provided textual information to make the generated 3D model more relevant to the textual information

- **Develop formal method to analyze network protocols**
  Graduate Researcher, NULogics Lab, Northwestern University, Advised by Prof.Hai Zhou — *Jul. 2023 - Now*
  - Designed a framework to implement automated end-to-end verification of high level network protocols to check vulnerabilities and confirm the security of the protocols
  - Used REACTIVE SYNTHESIS tools to automatically generate I/O automata, leveraged NuXMV as model checker to check whether the automata satisfies the correctness property

- **Multi-agent reinforcement learning with communication disturbances**
  Graduate Researcher, IDEAS Lab, Northwestern University, advised by Prof.Qi Zhu — *Apr. 2023 - Oct. 2023*
  - Implemented Proximal Policy Optimization for cooperative multi-agent robotics scenario with goal of enabling decentralized multi-agent decision making in the face of communication and observation disturbances
  - Designed an environment that allows multiple agents patrolling together, performed reward function design, action space and state space design, to train agents to completely patrol the environment in the minimum amount of time
  - Assisted in problem formulation to test novel MARL methods. Experimented with parallel environments for multi-agent learning based on Multi-Agent Proximal Policy Optimization
  - Designed search and rescue game to enable distributed Multi-Agent System planning research

PUBLICATIONS(* STANDS FOR EQUAL CONTRIBUTION)

- **Effect of Attention and Self-Supervised Speech Embeddings on Non-Semantic Speech Tasks** Payal Mohapatra*, Akash Pandey*, Yueyuan Sui*, Qi Zhu. **ACM Multimedia 2023 Multimedia Grand Challenges Track**
  https://arxiv.org/abs/2308.14359

WORK EXPERIENCE

DAHENG IMAGING — Beijing, China
Product Engineer — *Mar. 2022 - Aug. 2022*
- Collected and analyzed sales data of the company's industrial cameras and light sources for sales analysis
- Developed products sales plans for the company based on sales analysis, increased product sales over the same period last year
- Pitched appropriate products to clients and conducted live demonstrations

SKILLS SUMMARY

- **Programming Languages**: C/C++, Python, Java, MATLAB, Verilog
- **Frameworks**: TensorFlow, PyTorch, Keras, Scikit, Stable-Baselines3, PettingZoo