Yanjie Ze
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Education

- **Shanghai Jiao Tong University** Shanghai,China
  Bachelor of Engineering in Computer Science and Engineering *2019 – 2023*
  First Year GPA: 3.9/4.3(rank 12/118)

Research Interest

Recently my research interest lies in **3D Computer Vision** and **Reinforcement Learning**. The former needs more engineering skills and the latter is more theoretical, both of which I am happy to explore.
I am always willing to learn more about the field of **Artificial Intelligence and Computer Science** with great enthusiasm.

Research Experience

- **Machine Vision and Intelligence Group** SJTU, China
  Research Member *Oct 2020 - Present*
  - **3D computer vision**: Lead by Professor Cewu Lu, and Guided by Dr.Yang You, I am focusing on 3D computer vision. I have tried to implement an algorithm called PointPillars. Recently, our research mainly focuses on 3D instance segmentation and we are trying to figure out how to find a more effective way to detect small 3D objects.

- **Research on Multi-agent Reinforcement Learning on Multi-modal** SJTU, China
  Research Member *Feb 2021 - Present*
  Guided by Professor Shuai Li, we are focusing on using multi-agent RL to solve problems in multi-modal. Recently, I finished an image caption generator to be the basic tool of the whole model. The work is still carrying on.

- **PRP:Study on the Theory and Algorithms of Reinforcement Learning** SJTU, China
  Member *Jan 2021 - Present*
  Guided by Professor Shuai Li, I start to study Online Learning and Reinforcement Learning. We have a weekly reading group to discuss problems and knowledge, consisting of several excellent students from SJTU. I will do a presentation on Mar 28, 2021 in the reading group. The presentation is mainly about **Upper Confident Bound Value Iteration**(UCBVI) and the proof of its regret upper bound. The presentation material is uploaded to my website.

- **PRP:Research on Character Recognition Based On Machine Vision** SJTU, China
  Member *Feb 2020 - Aug 2020*
  Guided by ProfessorYansong Zhang , I got basic knowledge of Machine Learning and Computer Vision. Then we create a dataset based on the components from the workshop and the steamship ,which is divided into three big classed and many subclasses, and I trained a trivial CNN for the classification, which could have accuracy over 95%. Code is here.

Projects

- **Image Caption Generator**
  Owner *Mar 2021*
  Based on the paper: Show and Tell: A Neural Image Caption Generator, I make an implementation of the algorithm. The model is modified from LSTM and it takes the image as the input to be the information of hidden state and output the probability distribution of the caption. Code is here.

- **Asymmetric Cellular Automaton**
  Owner *Feb 2021*
  In MCM 2021, I took the role of the coder and implemented an asymmetric cellular automaton based on the algorithm I proposed : Seasonal Reproduction Algorithm. The algorithm is totally based on the bees' life habits. This model and the algorithm work together to achieve the simulation of the migration of the bees. Code is here(not open currently).

- **Point Pillars Implementation**

  Owner *Feb 2021*

  Based on the paper: PointPillars: Fast Encoders for Object Detection from Point Clouds, I make a trivial implementation of the algorithm. The algorithm splits the field into several pillars and then generates a pseudo-image used for detection. Then it utilizes a 2D detection method called SSD to detect objects.Code is here.

- **Visual Localization Project**

  Creator and Maintainer *Oct 2020 - Jan 2021*

  As the member of SJTU Robomaster Team Jiaoloong, I create and maintain this project. This is a computer vision project, based on both classic and advanced computer vision algorithm, using openCV, python and Mindvision industrial camera. In this project, I create a two-stage algorithm, which first uses yolov5 model to detect the tag and then uses contour extract alogorithm and solves PnP problem to return the camera's coordinate. Code is here.

Awards and Honors

- United Water Scholarship(Lianhe Shuiwu Scholarship),top1%, 12000¥, Nov 2020
- Municipal third prize for Contemporary Undergraduate Mathematical Contest in Modeling, Jan 2021

Teaching Experience

- Teaching Assistant in ME901:Engineering Practice Exploration and Research, Oct 2020 - Jan 2021
- Academic Counselor in CS171:C++ Programming Language, Dec 2020

Skills

- **Languages**: C++/C, Python, latex, matlab
- **English**:603 for the College English Test Band 4(CET4)
- **Sports**:Basketball (Got 10 points in Freshman Cup)