Xiangyu Zeng

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Education

2019.04 - present	**Bonn University, Germany**	MSc, Computer Science
2014.09 - 2018.06	**Shandong University, China**	BSc, Software Engineering

Internship

2020.07 - 2022.03   **Humanoid Robots Lab, Germany**   **Student Research Assistant**

- Read literature, design and implement algorithms.

2020.10 - present   **Fraunhofer IAIS, Germany**   **Full-stack python developer**

- Front-end and back-end development with Python.
- Document extraction, parsing, matching and comparison.

2017.08 - 2017.12   **Inspur Group Co., Ltd., China**   **Java developer**

- Java back-end development.
- SQL development.

Skills

- Be able to conduct academic research and engineering exploration, including literature review, algorithm design and implementation, and paper writing.
- With knowledge related to Reinforcement learning, Computer vision, Machine learning, Deep learning, Cognitive robots, Sensor data fusion, and other courses for intelligent systems.
- Have deep understanding of data structures and algorithm design.
- Be familiar with programming in Python, and Java.
- Can code with Javascript, C++ and other languages.
- Be familiar with Pytorch, Tensorflow
- Can use Pybullet, Ros, Gazebo.
- Chinese: native speaker; English: fluent

Project

1. Nav Learning - Humanoid Robots Lab - Algorithm development - 2021.10-2022.07

- – **Project introduction:** A hierarchical navigation framework for robot to reach the destination and react to the unpredictable dynamic obstacles. It reaches the goal by an A* global planning, and avoids the dynamic obstacles by deforming the path with DRL.
  - **My work:** I independently simulate the environment, design and implement a DRL and attention mechanism combined approach.

- **Skills:** Reinforcement Learning, Attention-mechanism, Pybullet, Python
- **Results:** The final results will be submitted as a paper to ICRA2023

2. Vpp Learning - Humanoid Robots Lab - Algorithm development - 2020.12-2021.12

- – **Project introduction:** A viewpoint planning framework for automatic exploration of 3D environment, with an RGBD camera attached to the robotic arm, to obtain more spacial information about fruits and crops.
  - **My work:** I designed and implemented a DRL based approach to determine the next best view, detecting and covering as many as possible regions of interest within a given time limit.
  - **Skills:** Reinforcement Learning, ROS, Python, C++
  - **Results:** The final results were published as a paper accepted by ICRA2022, with **code** available.

3. Capsicum Segmentation - Humanoid Robots Lab - Algorithm development - 2020.07-2020.12

- – **Project introduction:** A capsicum semantic segmentation library with the network DeepLabV3, that can be used to segment the capsicum images from the real environment.
  - **My work:** I solved the problems of the limited capsicum dataset available, data distribution difference, and class imbalance with multiple data augmentation methods, data preprocessing, and fine-tuning.
  - **Skills:** Computer Vision, Python, Image segmentation.
  - **Results:** With **code** available.

4. Mlgym - Fraunhofer IAIS - Algorithm test - 2022.02-2022.07

- – **Project introduction:** A python framework for distributed machine learning model training in research. It provides for the machine learning a training routine by component registry.
  - **My work:** Write almost all the test modules reaching a coverage rate 80%
  - **Skills:** Python
  - **Results:** With **code** available.

Publications

1. Deep Reinforcement Learning for Next-Best-View Planning in Agricultural Applications; ***Zeng, X.,*** *Zaenker, T. and Bennewitz, ICRA, 2022.*
2. Enhanced Spatial Attention Graph for Motion Planning in Crowded, Partially Observable Environments; *Shi, W., Zhou, Y.,* ***Zeng, X.,*** *Li, S. and Bennewitz, M.; ICRA, 2022.*
3. A scheduling algorithm for autonomous driving tasks on mobile edge computing servers; *Dai, H.,* ***Zeng, X.,*** *Yu, Z. and Wang, T.; Journal of Systems Architecture 94 (2019): 14-23.*

Competitions

- Kaggle: "Mechanisms of Action (MoA) Prediction"; Top 11%.
- Microsoft Innovation Cup in China; The third prize.

Personal Homepage

- Homepage: `https://zengxyu.github.io/about/`
- Github: `https://github.com/zengxyu`