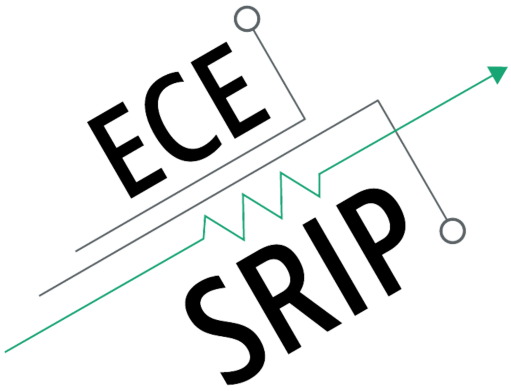


FACULTY MENTOR

Xiaolong Wang

PROJECT TITLE

Robotic Manipulation using Reinforcement Learning with Vision Foundation Model

PROJECT DESCRIPTION

We study how foundation models can help RL in manipulation. Our previous representative publications:

- Graph Inverse RL: https://sateeshkumar21.github.io/GraphIRL/ (CoRL 2022, Oral)
- RL with Multiple views: https://jangirrishabh.github.io/lookcloser/ (RA-L / ICRA 2022)
- RL with adaptation: https://nicklashansen.github.io/PAD/ (ICLR 2021)

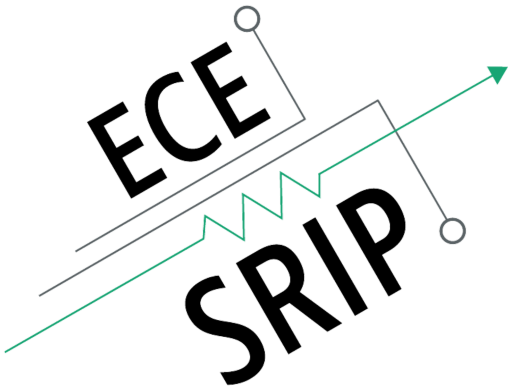
This project will be in person.

INTERNS NEEDED

3 Students

PREREQUISITES

- Strong coding skills in Python using scientific libraries like NumPy, Matplotlib
- Experience with one of the deep learning frameworks (PyTorch/TensorFlow/...)
- Experience with real robots and hardware
- Familiar with undergraduate-level linear algebra and calculus
- Familiar with (batch-)RL / imitation learning
- Robot motion planning and control



FACULTY MENTOR

Xiaolong Wang

PROJECT TITLE

Learning Legged Robot Locomotion with Reinforcement Learning

PROJECT DESCRIPTION

We study locomotion control with visual inputs and deploy the trained policy in the Unitree A1 robot. Our previous representative publications:

- https://rchalyang.github.io/LocoTransformer/ (ICLR 2022, Spotlight)
- https://mehooz.github.io/mmdr-wild/ (IROS 2022)

News from UCSD:

- https://jacobsschool.ucsd.edu/news/release/3511

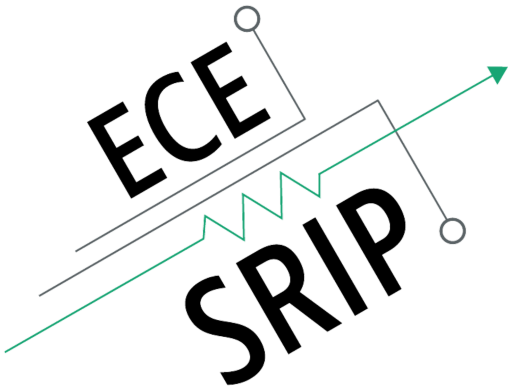
This project will be in person.

INTERNS NEEDED

3 Students

PREREQUISITES

- Strong coding skills in Python using scientific libraries like NumPy and Matplotlib
- Experience with one of the deep learning frameworks (PyTorch/TensorFlow/...)
- Experience with real robots and hardware
- Familiar with undergraduate-level linear algebra and calculus
- Familiar with (batch-)RL / imitation learning
- Robot motion planning and control



FACULTY MENTOR

Xiaolong Wang

PROJECT TITLE

Imitation Learning for Dexterous Manipulation using Allegro Hand

PROJECT DESCRIPTION

We collect demonstrations by recording videos or using teleoperation from humans to guide dexterous manipulation. Our previous publications:

- Learning from human videos: https://yzqin.github.io/dexmv/ (ECCV 2022)
- Learning from teleoperations: https://yzqin.github.io/dex-teleop-imitation/ (RA-L / IROS 2022)
- Learning from grasp affordance: https://kristery.github.io/ILAD/ (CoRL 2022)
- Learning with Point Cloud RL: https://yzqin.github.io/dexpoint/ (CoRL 2022)
- Learning with implicit function: https://jianglongye.com/cgf/

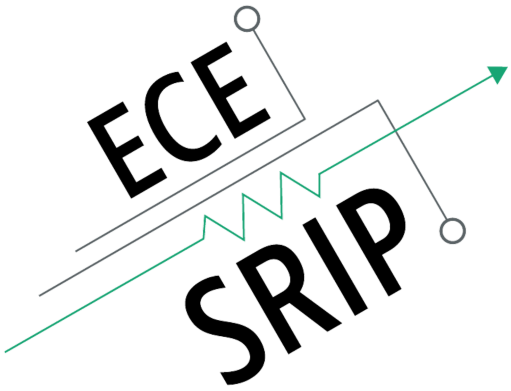
This project will be in person.

INTERNS NEEDED

3 Students

PREREQUISITES

- Strong coding skills in Python using scientific libraries like NumPy and Matplotlib
- Experience with one of the deep learning frameworks (PyTorch/TensorFlow/...)
- Experience with real robot and hardware
- Familiar with undergraduate-level linear algebra and calculus
- Familiar with (batch-)RL / imitation learning
- Robot motion planning and control



FACULTY MENTOR

Xiaolong Wang

PROJECT TITLE

Open World Recognition and Generation with Diffusion Models

PROJECT DESCRIPTION

Open-vocabulary recognition with large-scale vision-language foundation models and diffusion models. Previous related project:

- GroupViT: Semantic Segmentation Emerges from Text Supervision (CVPR 2022): https://jerryxu.net/GroupViT/

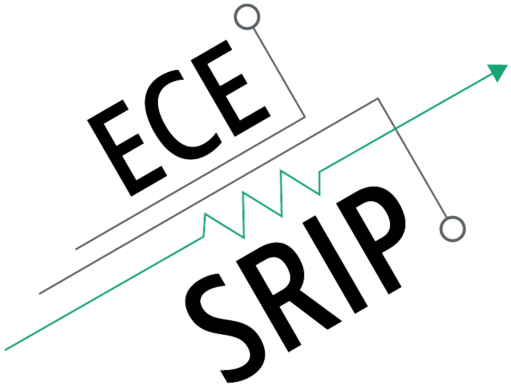
This project will be in person.

INTERNS NEEDED

2 Students

PREREQUISITES

- Experience in large-scale training and deep learning;
- Has publications in CVPR/ICCV/ECCV or equivalent tier-level conferences



FACULTY MENTOR

Xiaolong Wang

PROJECT TITLE

Learning Generalizable NeRFs on Large-Scale Data

PROJECT DESCRIPTION

Previous related project:

- Transformers as Meta-Learners for Implicit Neural Representations (ECCV 2022): https://yinboc.github.io/trans-inr/
- Multiplane NeRF-Supervised Disentanglement of Depth and Camera Pose from Videos: https://oasisyang.github.io/self-mpinerf/

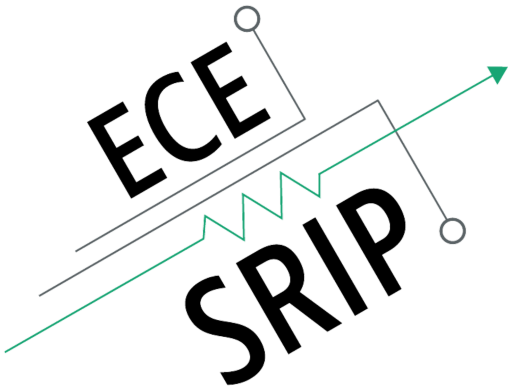
This project will be in person.

INTERNS NEEDED

2 StudentS

PREREQUISITES

- Experience in 3d vision
- Has publications in CVPR/ICCV/ECCV or equivalent tier-level conferences



FACULTY MENTOR

Xiaolong Wang

PROJECT TITLE

Object 6D Pose Estimation in the Wild

PROJECT DESCRIPTION

Previous projects:

- Category-Level 6D Object Pose Estimation in the Wild: A Semi-Supervised Learning Approach and A New Dataset (NeurIPS 2022): https://oasisyang.github.io/semi-pose/
- Self-Supervised Geometric Correspondence for Category-Level 6D Object Pose Estimation in the Wild: https://kywind.github.io/self-pose

This project will be in person.

INTERNS NEEDED

2 Students

PREREQUISITES

- Experience in 3d vision
- Has publications in CVPR/ICCV/ECCV or equivalent tier-level conferences