

Chao NI

Buchwiesen 2
Zürich
Switzerland

chao.ni@inf.ethz.ch
<https://n.ethz.ch/chaoni/>
+41 788605204

EDUCATION

ETH Zürich, Zürich, Switzerland
Master of Science In Robotics, System and Control
2019.9 -

Peking University, Beijing, China
Bachelor of Science
College of Engineering, 2015-2019
Bachelor thesis:
Cooperative Representation Learning with Self-Supervised Synchronization
Bachelor of Economics
National School of Development, 2016-2019

Johns Hopkins University, Baltimore, American
Visiting Student, Advised by Gregory Chirikjian, 2018.6-2018.9
The Laboratory for Computational Sensing and Robotics

Tsinghua University, Beijing, China
Research Assistant, Advised by Chongjie Zhang, 2019.1-2019.9
The Machine Intelligence Group

SELECTED COURSES

Mathematical Optimization
Convex Optimization
Model Predictive Control
Linear System Theory
Advanced Machine Learning

Probabilistic Artificial Intelligence
Dynamic Programming and Optimal Control
Robot Dynamics
Computational Animation for Robots

RESEARCH INTERESTS

- Legged robots, Trajectory Optimization, Model Predictive Control
- Reinforcement Learning

RESEARCH EXPERIENCE

MPC-feedback Trajectory Optimization for Wheeled-legged Robots
Advisor: Marko Bjelonic, Ruben Grandia, Marco Hutter 2020.3 - 2020.9

- Utilized a parameterized method to optimize for the trajectories on tough terrains; automatically switched between rolling and walking mode;
- Using Model Predictive Control(MPC) to track the optimized trajectory, verify the approach on the real robot ANYmal.

Hexapod Robot Control
Course Project 2020.5 - 2020.6

- Developed an inverse kinematic solver for the hexapod robot
- Designed multiple gaits and the transition between for the robot;
- Implemented obstacle avoidance features on tough terrain for the hexapod;
- The project and video can be found at <https://github.com/chaofiber/hexapod>

Cooperative Representation Learning with Self-Supervised Synchronization
Advisor: Chongjie Zhang **Collaborator:** Guangxiang Zhu 2019.3 - 2019.9

- Proposed Self-supervised Cooperative Network (SCN) utilizing synchronization between images and vectors using contrastive loss;
- Combined our model with PPO and showed that our model outperformed raw images in reinforcement learning problems.

Globally Optimal Reparameterization Algorithm-Based Frame Selection for Video Action Recognition

Advisor: Gregory Chirikjian **Collaborator:** Sipu Ruan 2018.6 - 2019.3

- Simulated the temporal fluctuation effect, illustrated the difference between a uniformly distributed video and a video with temporal fluctuation;
- Utilized the global optimal reparameterization algorithm (GORA) as a preprocess for frame selection in deep learning architecture;
- Compared the training performance between the GORA based frame selection method, uniform selection and random selection, and verified the advantage of the GORA based frame selection preprocess;
- Verified the outperformance of GORA in various deep learning neural network architectures.

**WORKING
EXPERIENCE**

Estimation Engineer

AMZ driverless racing

2020.10 -

- Estimation Module of the driverless car: In charge of SLAM;
- Maintenance of ROS-CAN Interface.

Teaching Assistant

Course: Information System for Engineers

2020.10-2021.1

SKILLS

Programming: C++, Python, MATLAB, Fortran, L^AT_EX;

Deep Learning: TensorFlow

Statistics: R, STATA, SPSS;

Operating System: Linux.

AWARDS

- Chen Overseas Exchange Scholarship (1%)(Peking University)
- 2017 & 2018 Academic Excellence Awards (5%) (Peking University)
- First Prize for the Mathematical Modeling Contest(Peking University)