Chao Ni

chaoni@ethz.ch | +41 788605204 | https://chaofiber.github.io/

EDUCATION

ETH Zürich Zürich, Switzerland
Master of Science in Robotics, Systems, and Control, GPA: 5.7/6.0 2019-2021
Thesis: Learning to Walk over Structured Terrains by Imitating MPC [link]

Peking University Beijing, China
Bachelor of Science in Applied Math, Double major in Economics, Major GPA: 90/100 2015-2019
Thesis: Exploiting Effective Representation via Cooperative Learning of Multi-Sensory Robotics Data [link]

Johns Hopkins University Baltimore, USA
International Student Exchange, Advisor: Gregory Chirikjian 2018.6-2018.9

PUBLICATIONS

• Schmid, L.*, **Ni, C.***, Zhong Y., Srinivasan, S., Cadena, C., Siegwart, R., and Andersson, O. (2021). Learning Sampling-based Exploration Planning. Unpublished manuscript, ETH Zürich, Zürich, Switzerland.
• **C. Ni,** A. Reske, T. Miki, J. Carius, R. Grandia and M. Hutter. (2021). Learning to Walk Over Structured Terrains by Imitating MPC. Unpublished manuscript, ETH Zürich, Zürich, Switzerland.[preprint]

RESEARCH EXPERIENCE

Robotics System Lab, ETH Zürich | Advisor: Marco Hutter Zürich, Switzerland
Learning to Walk over Structured Terrain by Imitating MPC [link] 2021.3-2021.9
• Leveraged demonstrations from MPC experts and trained a neural-network-based controller for robot locomotion.
• Utilized learning-by-cheating two-stage training schedule to cope with noisy elevation map information.
• Developed simulation environment for the robot walking over structured terrains and achieved sim-to-real transfer.

MPC-feedback Trajectory Optimization for Wheeled-legged Robots [link] 2020.3-2020.6
• Created a motion primitive library for wheeled-legged robots with trajectories generated by modulable optimizers and use Model Predictive Control (MPC) to track the trajectory.
• Developed the interface for the MPC solver to receive the primitive trajectory and verified it on the real robot.

Autonomous System Lab, ETH Zürich | Advisor: Roland Siegwart Zürich, Switzerland
Learning Sampling-Based Exploration Planning [link] 2021.3-2021.10
• Proposed a framework to learn the sampling distribution from next-best-view samples and bias the exploration towards the frequently visited area.
• Utilized Conditional Variational Autoencoder to generate samples given the local occupancy map.
• Evaluated the generalization ability of our learned planner on multiple test environments and realized sim-to-real transfer.

Visual Intelligence and Learning Lab, EPFL | Advisor: Amir Zamir Lausanne, Switzerland
Learning Task-Orientated Representations with Minimal Visual Capacity (in progress) 2021.10-

Machine Intelligence Group, Tsinghua University | Advisor: Chongjie Zhang Beijing, China
Exploiting Representation via Cooperative Learning of Multi-Sensory Robotics Data [link] 2019.1-2019.6
• Proposed a self-supervised cooperative network utilizing synchronization between images and vectors using contrastive loss to learn effective representations.

• Implemented and applied the learned representations in multiple downstream Reinforcement Learning (RL) tasks on different simulators.

Laboratory for Computational Sensing and Robotics, Johns Hopkins University |
Advisor: Gregory Chirikjian — Baltimore, USA
GORA-Based Frame Selection for Video Action Recognition [link] — 2018.6-2018.9
• 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.
• Verified the outperformance of GORA in various deep learning neural network architectures.

WORK EXPERIENCE

AMZ Driverless Racing, Formula Student | — Zürich, Switzerland
SLAM engineer — 2020.10-2021.2
• Investigated and maintained the simultaneous localization and mapping (SLAM) module of the driverless car.
• Developed key performance indicators of the SLAM module.
• Implemented the interface for the SLAM module and integrated novel features into the pipeline.

Introduction to Robotics and Mechatronics, ETH Zürich | — Zürich, Switzerland
Student lab assistant — 2021.3-2021.6
• Helped students to interface the computer with real-world applications.
• Assisted students with hardware (Adafruit Feather board, Pixy Camera) and software (C, Arduino, Matlab) issues.

Information System for Engineers, ETH Zürich | — Zürich, Switzerland
Teaching assistant — 2020.10-2021.12
• Taught students knowledge of Structured Query Language (SQL) using Python.
• Corrected and advised on student homework.

Turing AI Institute of Nanjing | — Nanjing, China
Research intern — 2019.6-2019.8
• Collected and summarized research papers in the area of policy gradients and relational reasoning.
• Adapted open-sourced Visual Interaction Network (VIN) code to the purpose of the research group.

SKILLS

Programming
C++ (+3 years), Python (+5 years), ROS (+2 years), PyTorch (+2 years), MATLAB (+6 years)
Language
English - Full professional proficiency **|** Chinese - Native **|** German - basic

AWARDS

• ETH Scholarship for international students ($6000, ETH Zürich, 2020)
• Chen Overseas Exchange Scholarship (1%) ($3000, Peking University, 2018)
• Academic Excellence Awards (5%) (Peking University, 2017&2018)
• First Prize for the Mathematical Modeling Contest ($800, Peking University, 2018)