Lin Cong

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Education

Ph.D. Student | ***Robotics & Deep Learning*** — Oct. 2017 – Present
Universität Hamburg (UHH) — Hamburg, Germany

M.S. | ***Robotics System Control*** — Sep. 2015 – Jun. 2017
Harbin Institute of Technology (HIT) — Harbin, China

B.S. | ***Mechatronic Engineering*** — Sep. 2010 – Jun. 2014
Harbin Institute of Technology (HIT) — Harbin, China

Skills

Speciality: Deep Reinforcement Learning, Robot Dexterous Manipulation
Programming: C++, Python, Matlab
Software: ROS, Tensorflow, Pytorch, Unity, Mujoco
Misc.: Strong coordination and organization ability, adapt ability and communication skills

Projects

Crossmodal Transfer of Dexterous Manipulation Skills — Oct. 2017 – present
Universität Hamburg — Hamburg, Germany

- Perform research and experiments on robot learning for TRR169 Crossmodal Learning
- Build simulation environment with Mujoco for robot learning
- Reinforcement learning algorithm design with Pytorch and Tensorflow for robot manipulation tasks
- Model deployment on real robot platforms using ROS
- Four publications with first or corresponding authorship (one pre-print paper included)

Exo-Skeleton Robot Control System and Algorithm Design — Jul. 2015 – Jul. 2017
Harbin Institute of Technology — Harbin, China

- 3D modeling for the Exo-Skeleton robot mechanical structure
- Control board, sensors and actuator integration
- Design the control system and algorithm for the Exo-Skeleton robot
- One first authorship publication on the robot follow-up control algorithm
- One co-author publication for the contribution of robot hardware design

Multifunctional Tourbillon Watch Mechanical Structure Design — Oct. 2010 – Jun. 2014
Harbin Institute of Technology — Harbin, China

- Design the mechanical structure for a multifunctional tourbillon mechanical watch
- 3D modeling with SolidWorks and 2D drawing with AutoCAD

Academic Training and Activities

Symposium on Crossmodal Learning in Humans and Robots — Nov. 2019
Universität Hamburg — Hamburg, Germany

CML Summer School 2019 — Sep. 2019
Universität Hamburg — Hamburg, Germany

CML Summer School 2018 — Sep. 2018
Tsinghua University — Beijing, China

Honors and Awards

Universität Hamburg — Nov. 2017
Full Scholarship from China Scholarship Council (CSC) — Hamburg, Germany

Harbin Institute of Technology — Jun. 2016
National Scholarship — Harbin, China

Harbin Institute of Technology — Oct. 2015
National Scholarship — Harbin, China

Harbin Institute of Technology — June. 2013
Second Prize for Bionic Robot Design Competition in HIT — Harbin, China

Harbin Institute of Technology — June. 2012
Third Prize for Mechanical Innovative Design Competition in HIT — Harbin, China

Robot Demonstration Presentations

Visual Pushing with Reinforcement Learning
https://www.youtube.com/watch?v=ffXmOHrG5HY

Multimodal Grasping with Reinforcement Learning
https://www.youtube.com/watch?v=PuYvUxyDnPY

Model Prediction and Robot Control for Object Planar Pushing
https://www.youtube.com/watch?v=z-gTJMs9tFg

Self-supervised Attention Mechanism
https://hitlyn.github.io/blog/2020/08/14/Attention-for-Reinforcement-Learning

Publications

Lin Cong, Hongzhuo Liang, Philipp Ruppel, Yunlei Shi, Michael Görner, Norman Hendrich and Jianwei Zhang.
Reinforcement Learning with Vision-Proprioception Model for Robot Planar Pushing. *Frontiers in Neurorobotics*, 2022

Hongzhuo Liang, **Lin Cong* (corresponding author)**, Norman Hendrich, Shuang Li, Fuchun Sun, Jianwei Zhang.
Multifingered Grasping Based on Multimodal Reinforcement Learning. *IEEE Robotics and Automation Letters (RA-L)*, 2021

Lin Cong, Yunlei Shi, Jianwei Zhang.
Self-supervised Attention Learning for Robot Control. *IEEE International Conference on Robotics and Biomimetics (ROBIO)*, 2021

Yunlei Shi, Zhaopeng Chen, **Lin Cong**, Yansong Wu, Martin Craiu-Müller, Chengjie Yuan, Chunyang Chang, Lei Zhang, Jianwei Zhang.
Maximizing the Use of Environmental Constraints: A Pushing-Based Hybrid Position/Force Assembly Skill for Contact-Rich Tasks. *IEEE International Conference on Robotics and Biomimetics (ROBIO)*, 2021

Lin Cong, Michael Görner, Philipp Ruppel, Hongzhuo Liang, Norman Hendrich, Jianwei Zhang.
Self-Adapting Recurrent Models for Object Pushing from Learning in Simulation. *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2020

Lin Cong, Dongmei Wu, Yi Long, Zhijiang Du, Wei Dong.
Parameter Identification Based Sensitivity Amplification Control for Lower Extremity Exoskeleton. *International Conference on Artificial Intelligence, Automation and Control Technologies (AIACT)*, 2017

Yi Long, Zhijiang Du, **Lin Cong**, Weidong Wang, Zhiming Zhang, Wei Dong.
Active Disturbance Rejection Control Based Human Gait Tracking for Lower Extremity Rehabilitation Exoskeleton. *ISA Transactions*, 2017