Pengzhi Yang

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Education

- **Delft University of Technology (TU Delft)** — Delft, Netherlands
  Master of Science - Computer Science, AI Technology; ***GPA: 8.51/10*** — *Sept 2022 - Nov 2024*
- **Eidgenössische Technische Hochschule (ETH) Zurich** — Zurich, Switzerland
  ETH Robotics Student Fellowship *(RSF) Program;* ***GPA: 6.0/6.0*** — *Jun - Sept 2023*
- **University of Electronic Science and Technology of China (UESTC)** — Chengdu, China
  Bachelor of Engineering - Computer Science; ***GPA: 3.90/4.00*** — *Sept 2016 - Jun 2020*
  Honors Diploma - Yingcai Honors College (Top 5% students enrolled)
- **University of California, Santa Barbara (UCSB)** — Santa Barbara, United States
  Semester Exchange - Computer Science; ***GPA: 4.00/4.00*** — *Mar 2019 - Jun 2019*

Selected Publications

1. **Pengzhi Yang**, Shumon Koga, Arash Asgharivaskasi, Nikolay Atanasov, Policy Learning for Active Target Tracking over Continuous $SE(3)$ Trajectories, *Learning for Dynamics and Control (**L4DC**)*, 2023. **Selected for Oral Presentation (top 16/167)**. [pdf]
2. **Pengzhi Yang**, Yuhan Liu, Shumon Koga, Arash Asgharivaskasi, Nikolay Atanasov, Learning Continuous Control Policies for Information-Theoretic Active Perception, *IEEE International Conference on Robotics and Automation (**ICRA**)*, 2023. [pdf] [video]
3. **Pengzhi Yang***, Haowen Liu*, Monika Roznere, Alberto Quattrini Li, Monocular Camera and Single-Beam SonarBased Underwater Collision-Free Navigation with Domain Randomization, *International Symposium on Robotics Research (**ISRR**)*, 2022. [oral] [doi] [video]
4. Jinjie Li, Liang Han, Haoyang Yu, Zhaotian Wang, **Pengzhi Yang**, Ziwei Yan, Zhang Ren, Potato: A Data-Oriented Programming 3D Simulator for Large-Scale Heterogeneous Swarm Robotics, ***ICRA Workshop**: Role of Robotics Simulators for Unmanned Aerial Vehicles*, 2023. [pdf]
5. Yunpeng Bai, Aleksi Ikkala, Antti Oulasvirta, Shengdong Zhao, Lucia Wang, **Pengzhi Yang**, Peisen Xu, Simulating Attention Switching On Optical Head-Mounted Displays While Walking, *ACM Conference on Human Factors in Computing Systems (**CHI**)*, 2024. [pdf]
6. **Pengzhi Yang**, Xinyu Wang, Ruipeng Zhang, Cong Wang, Frans A. Oliehoek, Jens Kober, Task-free Lifelong Robot Learning with Retrieval-based Weighted Local Adaptation, *Under Review*, 2025. [pdf]

Research Experience

- **Master Thesis Student, TU Delft** — *Feb - Nov 2024*
  Task-free Lifelong Robot Learning (see Pub. 6), with Prof. Frans A. Oliehoek, Prof. Jens Kober
  - Implemented a visuomotor policy to learn a series of manipulation tasks from demonstrations without task IDs or boundaries — introducing retrieval-based local adaptation with selective weighting to address the catastrophic forgetting problem in robots' lifelong run.
  - Established a memory-based lifelong robot learning paradigm enabling effective and dynamic skill restoration.
- **Research Assistant, ETH Zurich** — *Jun - Sept 2023*
  Sensor, Model Selections for Self-driving Codesign, with Dr. Dejan Milojevic, Prof. Emilio Frazzoli
  - Applied Exact and Variational Gaussian Process to assess camera and lidar-based object detection models with MMDetection3D, achieving sensor and model selection based on perception's False Positive and False Negative Rates with uncertainty quantifications.
  - Enhanced GUI to improve visualization and interaction for comprehensive model comparisons.
- **Research Assistant, University of California, San Diego (UCSD)** — *Feb 2022 - Jun 2023*
  Active Target Tracking (see Pub. 1, 2), with Dr. Shumon Koga, Prof. Nikolay Atanasov
  - Developed continuous control policy using both model-free and model-based reinforcement learning for information-theoretic robotic active exploration and mapping with a limited sensor field of view.
  - Utilized attention-based architecture to track multiple moving targets, integrating Kalman Filter to update target statistics within an MDP framework.

- **Research Assistant, Dartmouth College** *Jul 2019 - Feb 2022*
  Underwater Robot Navigation (see Pub. 3), with Prof. Alberto Quattrini Li
  - Developed a collision-free navigation system for Autonomous Underwater Vehicles with low-cost configurations.
  - Enhanced the end-to-end system's robustness and transferability by training in Unity Simulation with Domain Randomization, validated through extensive studies and field experiments.

- **Research Intern, Tencent RoboticsX** *Dec 2020 - Aug 2021*
  Quadruped Robot Locomotion, with Dr. Cheng Zhou
  - Trained DRL-based locomotion policies in PyBullet, enhancing adaptability with domain adaptation techniques and accelerating training using Tencent TLeague framework based on Kubernetes.
  - Deployed robust real-time control with C++, achieving reliable real-world locomotion on flat surfaces.

Academic Services

- Reviewer for ICRA 2025 *Nov 2024*
- Volunteer at Robotics: Science and Systems Conference (RSS 2024) *Jul 2024*
- Teaching Assistant of Deep Reinforcement Learning (CS4400 at TU Delft) *Nov 2023 - Feb 2024*

Selected Projects

- **Seminar Formal Methods for Learned Systems, TU Delft** *Feb - Apr 2023*
  - Conducted reachability analysis for neural network control systems using Julia and investigated shielding techniques in ML-based systems. Course received **9.0/10**. [**Final report**]

- **Robot Dynamics & Control, TU Delft** *Sept - Nov 2022*
  - Applied PD and PID controllers to control quadrotor and robot arm, achieving singularity-robust and task-priority control. Projects received **9.5/10**.

- **Compiler for Simplified C++, UCSB** *Apr - Jun 2019*
  - Built a simplified C++ compiler, including Scanner, Parser, Abstract Syntax Tree, Type Checking, and Code Generation, passed all tests with zero errors, generating valid X86 assembly code. Course received **A+**.

- **Development of an Eight-Stage Pipelined MIPS Processor, UESTC** *Apr - Jun 2018*
  - Built a 32-bit CPU based on gate-level circuits; embedded a deep pipeline into its ALU module; ran FFT on it and won **1st** place in the Efficiency Competition.

Skills Summary

- **Languages**: Python, C++, C, C#, Matlab, JavaScript, Julia, Verilog, Shell, XML, SQL, Latex
- **Frameworks**: Pytorch, GPytorch, Tensorflow, OpenCV, Keras, Eigen, Qt, Scikit, Pandas, MMDetection3D
- **Tools**: ROS, Unity, Kubernetes, Docker, GIT, Gazebo, Pybullet, IssacGym, UWSim, QGroundControl, VizDoom, Jupyter Notebook, SolidWorks, MathCad, Vivado, Wireshark, Multisim
- **Interests**: Travelling, **Photography**, Swimming, Biking, Scuba Diving (Open Water Certificate), Manual Work

Honors and Awards

- ETH Robotics Student Fellowship (top 8.9%) *Mar 2023*
- Shiqiang Enterprise Scholarship (top 1%) *Oct 2018*
- Excellent Student Scholarship in UESTC (top 5%) *Sept 2017/2018/2019*
- Excellence (top 10%) in College Students Innovation and Entrepreneurship Competition (2018) of UESTC *Jan 2019*
- Outstanding Volunteer as the team leader of a voluntary teaching organization in China rural counties *Oct 2017*
- Excellence Award for Business Competition at *Manulife* short-term program *Feb 2018*