Yang Wang

Learning-based Control, Machine Learning, Optimization, Robotics

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Education

Technical University of Kaiserslautern — Kaiserslautern, Germany
Master of Science in Electrical and Computer Engineering, CGPA: 1.6/1.0 — 10/2019–03/2022

Swiss Federal Institute of Technology in Lausanne — Lausanne, Switzerland
Visiting Student for Master's Thesis at Automatic Control Laboratory, Grade: 1.0/1.0 — 10/2021–03/2022

Polytechnic University of Catalonia — Barcelona, Spain
Erasmus Exchange Student in Automatic Control and Robotics, GPA: 8.14/10.00 — 03/2021–07/2021

Tomsk Polytechnic University (Double Degree) — Tomsk, Russia
Bachelor of Science in Automation of Technological Processes and Production, CGPA: 4.74/5.00 — 08/2016–06/2018

Shenyang Ligong University (Double Degree) — Shenyang, China
Bachelor of Science in Automation, CGPA: 90/100, Top 3% — 09/2014–07/2016

Research Experiences

Master's Thesis Project — Lausanne, Switzerland
Automatic Control Laboratory, Swiss Federal Institute of Technology in Lausanne — 10/2021-03/2022

- Developed a black-box safe optimization algorithm for non-linear, non-convex optimization problems;
- Numerical Optimization, Bayesian Optimization, Gaussian Process, Convergence and Safety Analyses;
- Matlab, Yalmip, Mosek, Python, Academic Presentation, Scientific Writing.

Student Research Assistant — Kaiserslautern, Germany
SmartFactory-KL, German Research Center for Artificial Intelligence — 10/2021-03/2022

- Integrated multiple identification benchmarks into a continuous-time neural network prediction model;
- Neural ODEs, Runge-Kutta Methods, Euler Method, Dynamic System Analysis;
- Tools: PyTorch, SciPy, NumPy, matplotlib, Pandas, Git.

Research Seminar — Kaiserslautern, Germany
Chair of Automation and Control, Technical University of Kaiserslautern — 05/2020-09/2020

- Topic: Learning robotic movements from human demonstrations with obstacle avoidance;
- Dynamic Movement Primitives, Potential Field Method, Robotic Dynamics;
- Matlab, Data Analysis, Scientific Writing, Academic Presentation.

Work Experiences

Guangzhou Zhihuihe Education Technology Co., Ltd. — Guangzhou, China
High School STEM Teacher — 10/2018-07/2019

- Prepared and taught STEM (Science, Technology, Engineering, Math) classes to high school students;
- Mechanical structure construction, Microcontroller programming, CAD modelling, PCB design and soldering;
- Motivated students' interests in science and engineering, encouraged their critical thinking, and trained their problem-solving ability.

Projects

- **Linear/Nonlinear MPC Controller Designs in Case Studies**
  Designed a linear MPC controller for water level control of a Quadruple-Tanks System using Yalmip, and a nonlinear MPC controller for the component concentration control of a chemical process using package CasADi.
- **Human Speech Emotion Recognition using CNN and LSTM Network**
  Collected and processed audio soundtrack data of people's daily conversation, built MLP, CNN and LSTM models to classify speakers' emotions, and analyzed the classification performance of each model.
- **Mobile Robots SLAM and Map Exploration in Unknown Environments**
  Developed a map exploration algorithm for mobile robots in unknown environments, optimized the exploration performance by maximizing a designed reward function, and implemented the algorithm in simulations on ROS.
- **Control of UR3 Robotic Arm for Chess Gaming on ROS**
  Worked as a team for a mobile robot project, developed an autonomous driving system using a PID controller to maintain a mobile robot within a defined driveway and avoid obstacles.
- **Mobile Robot Project**
  Worked in a team for a mobile robot project, developed an autonomous driving system using a PID controller for maintaining the robot within the driveway and avoiding obstacles, using the perception information from other modules.

Skills

- **Knowledge:** Autonomous Robotic, Motion Planning, SLAM, Learning-Based Control, Model Predictive Control, Robust Control, Machine Learning, Deep Learning, Convex Optimization, Bayesian Optimization, etc.
- **Programming Languages:** C/C++, Python, MATLAB, HTML/CSS.
- **Tools:** Git, LaTeX, Linux, ROS, PyTorch, Pandas, Scipy, sklearn.

Scholarships and Awards

- PROMOS DAAD Scholarship 2022
- Erasmus Exchange Grant 2021
- Tomsk Polytechnic University Scholarship for Excellent Performance (full GPA) 2017
- China Scholarship Council Scholarship 2016
- National Encouragement Scholarship (GPA in Top 5%) 2015

Volunteer Experience

TelcoDR Inc. Barcelona, Spain
Robot Expert Volunteer in MWC2021 07/2021-07/2021

Guangzhou Youth Science and Technology Museum Guangzhou, China
Museum Guide Volunteer 06/2019-07/2019

Additional

Languages: Chinese (mother tongue), English (fluent), Russian (intermediate), German (basic), French (basic).