

# Yang Wang

Learning-based Control, Machine Learning, Optimization, Robotics

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## EDUCATION

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<b>Technical University of Kaiserslautern</b> Master of Science in Electrical and Computer Engineering, GPA: 3.6/4.0	Kaiserslautern, Germany 10/2019–03/2022
<b>Swiss Federal Institute of Technology in Lausanne</b> Visiting Student for Master's Thesis at Automatic Control Laboratory, Grade: 4.0/4.0	Lausanne, Switzerland 10/2021–03/2022
<b>Polytechnic University of Catalonia</b> Erasmus Exchange Student in Automatic Control and Robotics	Barcelona, Spain 03/2021–07/2021
<b>Tomsk Polytechnic University (Double Degree)</b> Bachelor of Science in Automation, GPA: 3.74/4.00	Tomsk, Russia 08/2016–06/2018
<b>Shenyang Ligong University (Double Degree)</b> Bachelor of Science in Automation, GPA: 90/100, Top 3%	Shenyang, China 09/2014–07/2016

## RESEARCH EXPERIENCES

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<b>Master's Thesis</b> Automatic Control Laboratory, Swiss Federal Institute of Technology in Lausanne	Lausanne, Switzerland 10/2021-03/2022
<ul style="list-style-type: none"><li>• Developed a black-box safe optimization algorithm for non-linear, non-convex optimization problems;</li><li>• Numerical Optimization, Bayesian Optimization, Gaussian Process, Convergence and Safety Analyses;</li><li>• Matlab, Yalmip, Mosek, Python, Academic Presentation, Scientific Writing.</li></ul>	
<b>Research Assistant</b> SmartFactory-KL, German Research Center for Artificial Intelligence	Kaiserslautern, Germany 10/2021-03/2022
<ul style="list-style-type: none"><li>• Integrated multiple identification benchmarks into a continuous-time neural network prediction model;</li><li>• Neural ODEs, Runge-Kutta Methods, Euler Method, Dynamic System Analysis;</li><li>• Tools: PyTorch, SciPy, NumPy, matplotlib, Pandas, Git.</li></ul>	
<b>Research Seminar</b> Chair of Automation and Control, Technical University of Kaiserslautern	Kaiserslautern, Germany 05/2020-09/2020
<ul style="list-style-type: none"><li>• Topic: Learning robotic movements from human demonstrations with obstacle avoidance;</li><li>• Dynamic Movement Primitives, Potential Field Method, Robotic Dynamics;</li><li>• Matlab, Data Analysis, Scientific Writing, Academic Presentation.</li></ul>	

## WORK EXPERIENCES

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<b>Guangzhou Zhihuihe Education Technology Co., Ltd.</b> High School STEM Teacher	Guangzhou, China 10/2018-07/2019
<ul style="list-style-type: none"><li>• Prepared and taught STEM (Science, Technology, Engineering, Math) classes to high school students;</li><li>• Mechanical structure construction, Microcontroller programming, CAD modelling, PCB design and soldering;</li><li>• Motivated students' interests in science and engineering, encouraged their critical thinking, and trained their problem-solving ability.</li></ul>	

## PROJECTS

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- **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**

Developed a UR3 robotic arm control system for playing chess games, including a sensing module using a depth camera, a motion planning and collision check module, and communication and action execution modules.

- **Mobile Robot Project**

Worked in 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.

## SKILLS

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- **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, L<sup>A</sup>T<sub>E</sub>X, Linux, ROS, PyTorch, Pandas, Scipy, sklearn.

## SCHOLARSHIPS AND AWARDS

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| • 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

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<b>TelcoDR Inc.</b>	Barcelona, Spain
Robot Expert Volunteer in MWC2021	07/2021-07/2021
<b>Guangzhou Youth Science and Technology Museum</b>	Guangzhou, China
Museum Guide Volunteer	06/2019-07/2019

## ADDITIONAL

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