Zewen Yang

Education

Technical University of Munich 2019 - 2022
Harbin Engineering University 2017 - 2019
Ph.D. (Joint-Training) - Computer Science, Information & Technology

- Machine Learning: Safe Learning, Fusion Learning, Deep Learning
- Robotics: Linear & Nonlinear Control, Underactuated Control, Model Predict Control (MPC)
- Multi-Agent Systems: Cooperative Learning, Coordination Control, Communication Effect Analysis

Northeast Forestry University 2015 - 2017
M.Sc. - Mechanical and Electrical Engineering

Harbin University of Science and Technology 2010 - 2014
B.Sc. - Electrical Engineering and Automation

Experience

Data Scientist Retreat Jan 2023 - Ongoing
Data Scientist

- Statistical Learning for forecasting
  - Deployed ML App after web scraping, raw data analysis, data pre-processing and feature engineering
  - Predicted disease spread via time series models and evaluated different models via MLflow
- Deep Learning for computer vision
  - Real-time object detection and action detection with transfer learning
  - Trained classification models with vision transformer
- Natural language processing (NLP)
  - Extracted and visualized character relationship with named entity recognition for book Series
  - Fine-turned language models for segmentation and text generation tasks, such as GPT-2

Technical University of Munich - Chair of Information-oriented Control Sep 2019 - Nov 2022
Research Assistant

- Total publications: 45, patents: 12, citations: 200+, h-index: 9 (Google Scholar)
- Supervised 10+ student theses with several projects being graded with the highest score
- Teaching Curriculum: Advanced Control and Robotics
- **European Union's Horizon 2020 - SeaClear**
  Search, Identification and Collection of Marine Litter with Autonomous Robots 1.0 (5 Million €), 2.0 (9 Million €)
  - Developed a data-driven model for Autonomous Underwater Vehicles (AUVs) with safe quantification
  - Created a simulation platform for control testing of AUVs
  - Contributed hardware tests, e.g., grabbing bottles in various currents, in Marseilles and Hamburg port
- **European Union's Horizon 2020 - REHYB**
  Rehabilitation Based on Hybrid Neuroprosthesis (7 Million €)
  - Detected the abnormal movements for people with disability through DNN using multiple sensors, e.g., EMG
  - Studied the safe control of human muscles by FES to achieve functional movements
- **DFG & NSFC - COVEMAS**
  Control and Optimization for Event-triggered Networked Autonomous Multi-Agent Systems
  - Designed novel cooperative learning algorithms for centralized and distributed systems
  - Delivered the learning-based control protocols for the coordination of multiple interacting agents
  - Developed mode-free distributed MPC and shared distributed MPC control laws

Harbin Engineering University - College of Intelligent Systems Science and Engineering May 2019 - Jun 2022
Principal Investigator

- **Ph.D. Student Research & Innovation Fund of Fundamental Research Funds for Central Universities**
  Research on the Coordinated Control Method of AUV Swarm (70k ¥)
  - Teamed up a research team and successfully completed the project with top-tier publications
  - Proposed novel formation control methods for AUV swarm using the consensus algorithm

Harbin Engineering University - Institute of Marine Equipment & Control Technology Sep 2017 - Aug 2019
Research Assistant

- **National Natural Science Foundation of China & National Key Innovation Project**
  Environmental Prediction & Task Reconfiguration of AUV for Covert Operations in the Coastal Sea (600k ¥)
  Overall Technology Scheme of the Multiple AUVs System (50 Million ¥)
  - Developed advanced control algorithms for AUVs
  - Investigated obstacle avoidance and recovery docking approaches for AUVs
  - Wrote a chapter 'Reliability Analysis & Design Technology of AUV' in the book "Control Technology of AUV"

Education Bureau of Hulan District, Harbin (China) Mar 2017 - Jun 2017
Teaching Assistant

- Examined and modified the physics lesson plans of high school, taught the physics course

Suzhou Electrical Apparatus Science Academy Co., Ltd., Suzhou (China) Oct 2016 - Feb 2017
Test & Analysis Engineer

- Implemented and analyzed testing experiments for different characteristics of fiber optical current transformers

Harbin Turbine Co., Ltd., Harbin (China) Mar 2014 - Jun 2014
Automation Engineer

- CNC lathe programming, quality inspection

Activities

Automatica Munich (Germany), June 27–30, 2022

- Exhibited the **SeaClear** project

The 60th IEEE Conference on Decision and Control Austin, Texas (USA), Dec 13-15 2021

- Presented the paper "Distributed Learning Consensus Control for Unknown Nonlinear Multi-agent Systems based on GPs"

The 40th Chinese Control Conference Shanghai (China), Jul 26-28 2021

- Co-Chair of the Section "Multi-Agent Systems and Distributed Control"
- Presented the paper "Leader-following Group Consensus of Multi-agent Systems with Different Time Delays"

IEEE Oceans Marseille (France), Jun 17-20 2019

- Presented the paper "Coordinated Control for Trajectory Tracking of Multiple UUVs with Input Saturation"

The 38th Chinese Control Conference Guangzhou (China), Jul 27-30 2019

- Presented the paper "Diving Control of Underactuated UUV Based on Backstepping Upper Bound Sliding Mode Method"

The 44th Annual Con. of the IEEE Industrial Electronics Society Washington, DC (USA), Oct 21-23 2018

- Presented the paper "Discrete-time Path Tracking Control of UUVs Based on Virtual Leader under Time Varying Delay"

The 37th Chinese Control Conference Wuhan (China), Jul 25-27 2018

- Presented the paper "Horizontal Trajectory Tracking Control of AUV Using a Two-way Channel High Gain Observer"

The 15th 'Challenge Cup' of University Students Extracurricular Academic Science and Technology Competition Sep 2016 - July 2017

- Won the third prize of Heilongjiang Province, converted the results to 7 patents and 8 publications
- Contributed to the project 'Multi-layer Micro-automatic plant factory', designed and built the plant factory

Achievements

Outstanding Doctoral Graduate Jun 2022
Selected by Harbin Engineering University

National Scholarship for Doctoral Student Dec 2019
Issued by Ministry of Education of the People's Republic of China

Province Merit Student May 2019
Selected by Ministry of Education of Heilongjiang Province

Ministry of Industry and Information Technology Innovation and Entrepreneurship Scholarship Feb 2019
Issued by Ministry of Industry and Information Technology

China State Shipbuilding Scholarship Nov 2018
Issued by China State Shipbuilding Corporation Limited

Merit Student (four times) 2017 - 2021
Selected by Harbin Engineering University

Doctoral Scholarship (four years) 2017 - 2021
Issued by Harbin Engineering University

Outstanding Master Graduate Jun 2017
Selected by Northeast Forestry University

Outstanding Graduate Thesis Sep 2017
Selected by Northeast Forestry University

Excellent League Member (two times) 2015 - 2017
Selected by Northeast Forestry University

Master Scholarship (two years) 2015 - 2017
Issued by Northeast Forestry University

Bachelor Scholarship (four semesters) 2010 - 2014
Issued by Harbin University of Science and Technology

Skills Summary

- **Programming & Markup Languages**
  - Python, Matlab & Simulink, C/C++, HTML/CSS, Javascript, SQL, Latex, Markdown
- **Frameworks & Libraies**
  - PyTorch, TensorFlow, Keras, ROS, scikit-learn, statsmodels
  - OpenCV, D3.js, Gazebo, matplotlib, seaborn, plotly
  - Numpy, Pandas, Selenium, spaCy, NLTK, Gensim, tokenizers, transformers, openai(gpt-3.5-turbo, whisper-1)
- **Softwares & Tools**
  - Git, Jupter, Docker, AWS, MySQL, Streamlit, Qualisys, OpenSim, MR (myoRESEARCH)
- **Language**
  - English, German, Chinese

Reference

Sandra Hirche, Full Professor
ITR, School of Computation, Information and Technology, Technical University of Munich
hirche@tum.de

Zheping Yan, Full Professor
College of Intelligent Systems Science and Engineering, Harbin Engineering University
yanzheping@hrbeu.edu.cn

Heming Jia, Full Professor
Department of Information Engineering, Sanming University
jiahemінglucky99@126.com