

Xin Yao

Holding a work permit in Switzerland (B-CH)

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PROFESSIONAL SKILLS

Programming: Python, C/C++, Matlab

Machine Learning: Pytorch, Tensorflow, OpenCV

VR/AR/MR: Unity, SteamVR, Meta Quest 2/3/Pro, Pico 4, HTC Vive

Robotics: ROS, SLAM, Modbus

Data Science: Spark, MongoDB

Hardware Design: PCB Design, Siemens PLC

EDUCATION

Politecnico di Torino

ICT for Smart Societies

Master's Degree

Sept. 2019 – Oct. 2022

Southwest University

Electronic Science and Technology

Bachelor's Degree

Sept. 2013 – Jun. 2017

PUBLICATIONS

Comparative Analysis of Neural Networks Techniques to Forecast Airfare Prices

2023

2023 IEEE International Conference on Computers, Software, and Applications

Alessandro Aliberti*, **Xin Yao**, Alessio Viticchiè, Enrico Macii, Edoardo Patti* (*Supervisors)

PATENTS

A Method of Small Particle Crop Drying Control, CN105605906A

2016

Zhuyu Ding*, **Xin Yao**, Mingjin Yang, Bin Liu, Jia Huang, Li Fan, Guanglin Zhang

A Sliding Adsorption Cleaning Device for Glass Surfaces, CN204562022U

2015

Zhuyu Ding*, Li Fan, Wenbo Ding, **Xin Yao**, Xin Shu

WORK EXPERIENCE

Syncroweb Srl.

Software Engineer Intern

Feb. 2023 – May. 2023

- Design, develop, and test the Android applications using Kotlin programming language.
- Integrate the applications with the company's back-end systems.

Shenyang Automation Research Institute (Kunshan) Intelligent Equipment Research Institute

Robotics Engineer

Oct. 2017 – Aug. 2019

- Research and development of industrial robots for sorting, and service robots for retail.
- Implemented SLAM, object detection, and pose estimation algorithms and integrated them with ROS.
- Implemented several functions like human-robot interaction display and voice prompts.
- PCB design, Modbus communication debugging, and software functional testing.

RECENT PROJECTS

MUNet for Blind Compressed Image Enhancement

2024

- This challenge is to enhance the quality of compressed images compressed with a large range of quality factors.
- I designed a simple yet powerful network based on the residual UNet architecture. It utilizes an MLP to extract deep features from the latent space, which are then fused into the decoder through channel attention.
- The proposed MUNet achieved significantly better performance than the previous state-of-the-art method (by 0.26 dB on PSNR).
- I co-authored the final challenge report, which will be presented at NTIRE challenges in CVPR 2024.

YOLOv9 for Dense Object Detection and Counting

2024

- Detecting and counting dense objects poses a significant challenge due to their small size and the presence of numerous targets within a single image.
- Upon the release of YOLOv9, I quickly implemented the method for dense object detection and counting. I utilized a rebar dataset captured in the real production environments of manufacturing companies.
- I achieved a state-of-the-art detection and counting result, with an accuracy of 98%.
- I open-sourced the code with a well-documented report with a detailed code explanation.

Full Body Tracking and Animation for Immersive Mixed Reality

2024

- Full body motion tracking is important in VR/AR applications for an immersive experience. However, most existing VR/AR applications only have only hands or upper-body representations.
- I implemented different methods using VRIK and deep learning models to estimate the full body motion tracking given only sparse tracking signals.
- I developed a data recording and visualization framework using Unity, enabling real-time functionality for various common human motions with a Meta Quest headset and two controllers.

QuestTeleop: Robotic Teleoperation using a Meta Quest Headset

2023

- The goal is to revolutionize teleoperation in environments that pose significant risks to human operators.
- By leveraging the immersive and intuitive control capabilities offered by VR headsets, the system provides users with a highly responsive and naturalistic interface for manipulating robotic appendages in real-time.
- The hand pose is obtained using Unity, and then the joint angle of the robot arm is solved using Bio IK.
- Users can teleoperate a robotic system wearing only a Meta Quest headset.

SLAM in Virtual Reality using Unity and ROS

2023

- I designed a framework for simultaneous localization and mapping (SLAM) when users are playing VR games.
- This technique can improve user engagement and immersion and serve as a critical tool for developers to prototype and refine navigation algorithms within safe, controlled virtual settings.
- I built a VR game where the user is located in a robot car on an old seaport, which offers a visually rich and detailed landscape for exploration.
- The users can play VR games with a first-person view in a robot car in Unity, while the scene perceived by the robot is transmitted into ROS2 for SLAM.

Master Thesis: Machine Learning Methodologies for Airfare Prediction

2022

- In this thesis, I introduced a novel Bayesian neural network method for airfare prediction, demonstrating superior performance over other machine learning methods on a dataset of 10,683 domestic routes.
- I made a systematic comparison between traditional methods (Ridge Regression, KNN, Random Forest) with deep learning techniques (FCN, CNN, Transformer) for airfare prediction.
- The proposed Bayesian airfare prediction network has achieved a new state-of-the-art method, showing great potential for real-world application.
- This work was **published** in the 2023 IEEE International Conferences on Computer, Software, and Applications.

LANGUAGES

Chinese: Native

English: C1

German: A1

Italian: A1

AWARDS

Scholarships

- National Scholarship Jun. 2016
- National Inspirational Scholarship Jun. 2015

Technology Innovation

- Grand Prize, The Second Mobile Robot Contest, Science and Technology Committee May. 2015
- National Undergraduate Innovation and Entrepreneurship Training Program Dec. 2015
- Meritorious Winner, International Interdisciplinary Contest In Modeling (ICM) Feb. 2016
- Second Prize at Southwest University, Research on a Serpentine Robot Device Jul. 2016