LEIHUI LI

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Aarhus, Denmark

EXPERIENCE

• **Vision TOP [⊕]**   *Jun 2019 - Dec 2019*
3D Vision Engineer (Intern)   Tianjin, China

Developed algorithms for an automated surface quality inspection system for high-speed rail components, processing 3D scanner data to reduce inspection time from 5 minutes to 30 seconds per workpiece, while collaborating with a cross-functional team to enhance efficiency in quality control of friction plates and oil tubes.

◦ Tools Used: C++ and PCL

EDUCATION

• **Department of Mechanical and Production Engineering, Aarhus University**   *Jun 2022 - Jun 2025*
PhD Student, Robotics and Compute Vision   Aarhus, Denmark

Title: Intelligent Solution to Advancing the Manufacturing and Products of *Jungner* Leveraging Robot Interaction Technologies with 3D Vision and Digital Twin

• **School of Computer Science and Engineering, Tianjin University of Technology**   *Sep 2018 - Jun 2021*
Master Degree   Tianjin, China

A-Class postgraduate scholarship, 2018. B-Class postgraduate scholarship, 2019

• **School of Computer Science and Engineering, Tianjin University of Technology**   *Sep 2014 - Jun 2018*
Bachelor Degree   Tianjin, China

Courses/score: Advanced Programming Language(C/C++) (**95/96**), Computer Graphics (**98**), Course Design of System Simulation Analysis (**100**)

◦ National College Students Innovation and Entrepreneurship Training Program, 2017

◦ Contemporary Undergraduate Mathematical Contest in Modeling, 2017 (**Third Prize**)

◦ "Mingli Cup" Extra-curricular Academic and Scientific Works Competition, 2015 (**First Prize**)

◦ Campus Software Innovation Competition, 2014 (**Third Prize**)

PROJECTS

• **Project 1: Surface Quality Inspection System Based on 3D Vision**   *Aug 2019 - Mar 2021*
Tools: C++ and PCL

This project aimed to detect and analyze defects and dimensions of workpieces using advanced 3D vision techniques. Using high-speed brake pads and oil pipe threads as examples, we scanned and obtained point cloud data to assess product quality in manufacturing. I was responsible for processing and analyzing the point cloud data, including alignment, plane segmentation, and algorithm development.

• **Project 2: QR Code Recognition in Complex Scenarios**   *Jan 2017 - Jun 2017*
Tools: C++ and OpenCV

In this project, I collaborated with other teams to implement a real-time simulation and modeling system using AnyLogic (a simulation software), focusing on QR code recognition for multi-target objects. I was responsible for optimizing the efficiency of 2D code recognition using OpenCV and multi-threaded programming.

• **Project 3: Infrared Vision-based Intelligent Steamer Feeding System**   *Jul 2015 - Dec 2016*
Tools: C++

This project aimed to develop a steamer feeding system that detects missing material areas in real-time, sending commands to control robots that fill these areas with robotic arms. I was responsible for developing algorithms to locate and segment the missing material, as well as performing tasks such as polygon and arc intersection and area estimation.

[J.6]　**Leihui Li** and Xuping Zhang. **A Robust Assessment Method of Point Cloud Quality for Enhancing 3D Robotic Scanning**. *Robotics and Computer-Integrated Manufacturing*, Vol. 92, 2025. Paper, Code.

[J.5]　**Leihui Li**, Xuping Zhang et al. **Automatic Robot Hand-Eye Calibration Enabled by Learning-Based 3D Vision**. *Journal of Intelligent & Robotic Systems*. Vol. 110, 2024. Paper, Code.

[J.4]　Xingyu Yang, Yixiong Du, **Leihui Li**, Zhengxue Zhou, Xuping Zhang. **Physics-Informed Neural Network for Model Prediction and Dynamics Parameter Identification of Collaborative Robot Joints**. *IEEE Robotics and Automation Letters*. 2023. Paper

[J.3]　Xingyu Yang, Zhengxue Zhou, **Leihui Li**, Xuping Zhang. **Collaborative robot dynamics with physical human–robot interaction and parameter identification with PINN**. *Mechanism and Machine Theory*. Vol. 189, 2023. Paper

[J.2]　Zhengxue Zhou, **Leihui, Li**, Fursterling Alexander, Joshua Hjalte, Durocher, Mouridsen Jesper, and Xuping Zhang. **Learning-Based Object Detection and Localization for a Mobile Robot Manipulator in SME Production**. *Robotics and Computer-Integrated Manufacturing*. Vol. 73, 2022. Paper, Code.

[C.1]　Zhengxue Zhou, **Leihui Li**, Riwei Wang, Xuping Zhang **Deep Learning on 3D Object Detection for Automatic Plug-in Charging Using a Mobile Manipulator**. In *IEEE International Conference on Robotics and Automation (ICRA)*, 2021. Paper, Code.

[J.1]　**Leihui Li**, Riwei Wang, Xuping Zhang. **A Tutorial Review on Point Cloud Registrations: Principle, Classification, Comparison, and Technology Challenges**. *Mathematical Problems in Engineering*, 2021. Paper

CO-SUPERVISION OF MASTER'S PROJECTS

• **3D Vision for Robotic Bin Picking**　　　　　　　　　　　　　　　　　　*Jul 2022 - Mar 2023*

The goal of this thesis is to develop a flexible solution that utilizes computer vision and grasping position detection. It concludes by integrating each component into a unified prototype and evaluating the model's performance with unseen objects. Despite some challenges, the prototype successfully accomplished the task of manipulating objects within a cluttered environment.

• **Smart Geometrical Quality Inspection**　　　　　　　　　　　　　　　　　*Jan 2023 - Sep 2023*

The goal is to design and implement an automated 3D scanner prototype utilizing low-cost devices for digitizing entire geometries aimed at geometrical quality control. Central to this method is the pairwise registration of all point cloud fragments, organized into a complex pose graph, which is optimized with an integrated pruning process to eliminate poor registrations.

SKILLS

• **Programming Languages:** C++/C, Python, MATLAB, HTML/CSS/JavaScript and Java
• **Tools:** Jupyter Notebook, SolidWorks, Visual Studio, Git, Latex, ROS and Markdown
• **Language Skills:** Chinese(Mandarin), English