Kexin YIN

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I am a first-year PhD student in industrial AI with a solid educational background and industry experience. I am interested in developing a career that transfers state-of-art research results into technological applications while maintaining my interest in developing new algorithms and software in the wider STEM field. I am keen to use my professional knowledge and teamwork spirit to contribute to society and industry.

EDUCATIONAL BACKGROUND

- **The University of Huddersfield,** *PhD Student* **01/2023 - now**
  EPSRC-funded project: Digital Twin Enabled In-line Process Optimization for Additive Manufacturing
- **The University of Manchester,** *MSc* **09/2018 - 11/2019**
  Major: Advanced Manufacturing Technology and Systems Management
- **Harbin Institute of Technology at Weihai, China,** *BE* **09/2014 - 06/2018**
  Major: Naval Architecture and Ocean Engineering

EMPLOYMENT

- **The 54th Research Institute of CETC,** *Assistant Engineer* **04/2020 - 09/2022**
  Duties: Data processing and machine learning analysis for high-performance measurement

RESEARCH EXPERIENCE

- **Topic Modelling to find topics and trends in academic papers,** *Team Member* **05/2023**
  This team was sponsored by the Alan Turing Institute and The Discovery Project at Dstl. Focusing on the emerging topics and trends in academic papers for future analysts, we tracked how topic models generated by BERTopic changed over time and identified the convergence and divergence between and within the topics. My job was to generate the summary for each topic based on the keywords via Sumy. My work has reduced the reading time of experts on topics by 90%.
- **Median statistics in geometrical product specification,** *Team Member* **10/2022 - now**
  This project investigates the application of median statistics on a discrete point cloud for outlier detection, association, and filtration. I compared the Theil-Sen estimator (based on median regression) and the least square estimator (based on average regression) by fitting 2D and 3D linear geometries, proving that the TS estimator is more stable when processing data with under 29.3% outliers and leading to a possibility to apply neural network with median regression in the non-linear geometrical specification.
- **Health condition monitoring for an astronomical telescope,** *Team Member* **01/2022 - 08/2022**
  The aim of this project was to monitor the condition to prevent the failure of an astronomical telescope. My team and I installed infrared cameras near the vital bearings, and I developed a python program for wireless pressure data reception. Through extensive data collection and pre-processing, I utilized CNN-based analysis of infrared images to predict the highest temperature area of the bearings under different workloads with an accuracy of 97%.

- **Photogrammetry with human-drone interaction,** *Team Leader* **07/2021 - 12/2021**

The purpose of this project is to improve the efficiency of photogrammetry, while drones were introduced into the system with an intelligent camera station layout procedure. In instances where drones proved to be inadequate, I utilized a relative coordinate system and external sensors to monitor the trajectory of the drone. Afterward, routine validation (AUC=0.93) against the control panel feedback was achieved by Monte Carlo sampling and multilayer perception.

- **Performance test of a CNC machine under heavy-duty operation,** *Team Leader* **08/2020 - 06/2021**
  The goal of this project was to verify the stability of the CNC machine. I led a team of 4 people with knowledge of different domains, conducting signal collection and analysis experiments with acoustics and vibration sensors. I introduced Bayesian Neural Network to multi-modal signal processing, finally reaching MAE <0.05 and ensuring a 48-hour work patch with 95% confidence.
- **Prototype test of a flexible medical drill robot,** *Team Member* **03/2019 - 08/2019**
  The project's aim was to design and test a flexible robot for orthopedic surgery with 3D printing. I utilized an orthogonal experiment strategy to select input parameters to print the robot body samples, which required me to carefully analyze historical data and experience to reach an optimal direction. After 3 batches of experiments, an efficient and cost-saving schedule was achieved.
- **Performance experiment of drilling tool with dynamometers,** *Team Leader* **11/2018 - 12/2018**
  The team project led by me focused on analyzing the torque and thrust during drilling processing compared with simulation data. My duties involved signal collection with FPGA and advanced data analysis including Hamming Window Function to reduce spectrum energy leakage and Kalman Filter to ensure accurate noise filtration with an MSE of 0.16. My leadership ensured a successful team project (Merit) with a solid view of critical service life prediction for drilling tools.
- **Exchange Program in Incheon National University, Korea,** *Exchange Student* **02/2016 - 06/2016**
  I was invited to join the lab research for the underwater robot prototype safety test. and am responsible for installing pressure sensors, which involved meticulous attention to detail and critical thinking to ensure their accurate and reliable performance.

SKILLS

- Language: Chinese (native speaker), English (fluent)
- Programming: Python (proficient), MATLAB (skilled), LabVIEW (average)
- Interpreter: Jupyter Notebook (proficient), MATLAB (skilled), Visual Studio (skilled), R (average)

AWARDS

- Third class outstanding scholarship of Harbin Institute of Technology in the 2017-2018 academic year
- First prize of the 2020 Science Development Fund of the 54th Research Institute
- Second prize of the 2021 Technological innovation of the 54th Research Institute

PUBLICATIONS&PATENTS

- Microwave device simulation analysis based on AdvantEdge, Journal of Hebei Academy of Sciences, 2021
- Patent: A processing method of orthogonal mode converter, 2021
- Patent: A water-floating flexible multi-point curved surface supporting structure (accepted), 2022
- Patent: A support structure for high-precision horizontal measurement (accepted), 2022