JIAQI YE, Ph.D

✉ jxy404@outlook.com ☏ +44(0)7935431909

School of Engineering, University of Birmingham, Birmingham, B15 2TT, UK

Research Profile

PhD graduate, problem solver, and good communicator (in both English and Mandarin), can be judged by my six years experience of designing, testing, and commissioning laser and vision sensing systems, strong publication records, and several industrial projects that I successfully delivered. Specialise in the design of AI-powered sensing systems, multi-sensor fusion, image processing techniques, 2D/3D measurement and reconstruction, and deep learning algorithms. Looking for a transition to the industry to collaborate with team members and explore the fun of using cutting-edge sensing and AI techniques to help solve real-world problems.

AREAS OF EXPERTISE

- Laser and Camera Systems
- Sensor Fusion and Automation
- 2D/3D Sensing System Design
- Machine Learning/Deep Learning
- Image and Point Cloud Processing
- Object Classification, Detection, and Segmentation
- Measurement and Inspection
- Embedded Systems
- Robotics Manipulation

TECHNICAL PROFICIENCIES

Programming Language: Python; MATLAB; C/C++

Software: Microsoft Office Suite (Word, Excel, PowerPoint); Git; Arduino; Keil; SolidWorks

EXPERIENCE HIGHLIGHTS

University of Birmingham, Birmingham, UK **02/2018 – Present**

Research Assistant, Birmingham Centre for Railway Research and Education (05/2022 - Present)

Supervised two PhD students to carry out applied research, accessed the latest research findings, and formulated solutions to ensure the successful completion of ongoing projects. Demonstrated responsibility, as a technical leader, by conceiving detailed R&D routes, partnering with cross-functional personnel, and successfully reaching milestones on schedule.

- **Handicare Automation** (05/2022 - Present) Improved the quality and efficiency of a stairlift manufacturing line by combining computer vision and artificial intelligence technologies with robotics.
  - Used project coordination, and research skills to aid in the successful project win of the Handicare grant; valued at £288,000.
  - Responsible for conceiving, developing, and testing vision and AI algorithms for UR robotic platforms.

PhD Candidate (02/2018 – 04/2022)

Independently planned and managed a research project on the development of laser- and vision-based high-precision inspection approaches applied to safety-critical components in the railway. Worked as a core member in multi-disciplinary teams for two industrial projects and one research project and successfully made the deliveries. Prepared and summarised research outcomes, outlined in more than ten papers published in various IEEE, IET, and IMechE journals.

- Proficiency with sensing and sensor fusion techniques, and firstly proposed a portable multi-sensor prototype integrating a laser, a camera, and an IMU for high-precision 2D/3D object measurement.
- Research on 2D/3D point cloud registration and localisation methods (e.g., ICP), developed a dedicated graphical user interface (GUI) software for high-precision 2D/3D reconstruction and wear assessment of large infrastructures such as the rail.
- Experience with ML/DL architectures (e.g., CNNs and FCNs) and frameworks (e.g., TensorFlow, Keras, and PyTorch); developed several dedicated DL models applied to real-world rail inspection to support more efficient remedial works.

- **The Royal Society of UK and National Natural Science Foundation of China** (03/2019 – 03/2021) Organised the international exchange scheme between the UoB and Xi'an Jiaotong University (XJTU).
  - Planned and organised the project application and was successfully awarded the grant of £70,000 in total.
  - Collaborated with researchers from XJTU and explored the feasibility of using 3D class segmentation deep learning

methods to assist the health monitoring and fault diagnosis of complex machinery components.

- **European Union's Horizon 2020** (02/2018 – 06/2020) Participated in the Shift2Rail research and innovation project (with a total budget of € 5 million) aiming to deliver a semi-autonomous optical inspection system that contributes to the establishment of cost efficient and reliable infrastructure.
  - Worked in a multidisciplinary team of 5 and focused on redesigning the firmware (based on a ChipKIT uC32 board) and the software (involving SDK and API techniques) for a portable laser scanner (Micro-Epsilon 2D), to allow for its interaction with mobile actuators such as drones and robotic arms.
  - Proposed an IMU and vision-based 6DoF laser motion detection and tracking algorithm, and achieved semi-autonomous profile measurement and wear assessment for fatigue component in the railway.
  - Responsible for delivering the related sections of the final report, system tests, and the final demonstrator as the main deliverable of the project.
- **China High-speed Rail** (05/2019 – 05/2020) Worked as an R&D team lead and proposed a vision-based 24hr remote condition monitoring strategy for a reciprocating device in the railway.
  - Deigned the prototype involving an embedded vision system, dedicated algorithms, and cloud computing. The system has been deployed and proven to save up to 50% cost of unnecessary visual inspections.
  - In charge of the client relationship and managing the project timeline, remote code version control through Github, and on-site system testing and optimisation.

National Laboratory for Optoelectronics, China **02/2014 – 08/2014**
Research Assistant

- Worked as a research assistant and learned 3D imaging techniques including depth cameras, X-rays, and lasers.
- Assisted with the development and test of a laboratory prototype for a Kinect-based depth-sensing system.

EDUCATION

University of Birmingham, UK **02/2018 – 03/2022**
PhD, Electronic, Electrical and Systems Engineering
Thesis: Next-generation Multi-sensor Inspection Systems and Their Applications in Rail

MRes, Electronic, Electrical and Systems Engineering **09/2015 - 09/2017**
Thesis: 3D Perceptual System for the Detection and Characterisation of Surface Defects in Rail

BEng, Electronic & Electrical Engineering, 1st class honours **09/2014 - 07/2015**
Dissertation: Vision-based Non-invasive Switch Inspection System

Huazhong University of Science and Technology, top 10 universities in China **09/2011 - 09/2014**
BEng, Electronics and Information Engineering, Grade average: 82.0/100

HONORS & AWARDS

No Corrections Passing PhD Viva, University of Birmingham (04/2022)

Full PhD Scholarship, Birmingham Centre for Railway Research and Education (BCRRE) (02/2018)

SAGE Best Journal Paper Award, Proceedings of the Institution of Mechanical Engineers (IMechE) (03/2019)

Best Master Research Thesis, BCRRE (09/2017)

PROFESSIONAL AFFILIATIONS & PUBLICATIONS

Reviewer of Journals: 《IEEE Transactions on Industrial Electronics》·《IEEE Transactions on Instrumentation and Measurement》·《IET Image Processing》 《MDPI Sensors》

STEM Ambassador: STEM Learning UK

10 journal papers (5 first-authored plus 5 co-authored) in the field of NDT inspection. Total list of publications available at: researchgate.net/profile/Jiaqi-Ye-6

RIGHT TO WORK

Graduate Visa – unrestricted right to work for 3 years plus an applicable indefinite leave to remain in between.