Richard Williams PhD

Lead Engineer

PROFESSIONAL EXPERIENCE

Lead Technical Architect — Sep '21 - Oct '22
Karakuri Ltd — London, UK

- Directed **technical development** for Karakuri's three cutting edge kitchen automation products overseeing **three** engineering departments.
- Developed a cutting edge **digital twin** framework (Python) using genetic algorithms to analyse and optimise customer transactional data
- **Architected** the company's data storage and analysis infrastructure, processes and tools (GCP, BigQuery, SQL, Superset)
- **Spearheaded** the development of a new model-based requirements capture system for the the company's product development

Head of Mechatronics — Feb '20 - Sep '21
Karakuri Ltd. — London, UK

- Led a **multidisciplinary team** of engineers to deliver the first two prototypes of Karakuri's **flagship** meal assembly system the DK-One
- Developed **machine learning models** to detect food items, classify packaging and assess quality in food preparation (PyTorch, Python, GCP)
- **Developed** a self contained embedded, deep neural network inference framework (Python) allowing Karakuri to integrate **advanced computer vision** into their products
- Created a **modular** hardware, electronics and software **architecture** for Karakuri's complex products (C, FreeRTOS, Protobuf, RS485, Golang)
- **Formulated** the company's technical roadmap, taking key commercial milestones and turning them into a **deliverable** plan for the engineering team

Senior Robotics Engineer — Dec '19 - Feb '20
Karakuri Ltd — London, UK

- Created a **collaborative** robotic **test platform** (C++, Python) to automate the validation of Karakuri's food dispensing technology with zero human effort
- Investigated and solved a **critical issue** with Karakuri's food dispensers, taking them from a success rate of 30% to 93%

Director of Robotics — Apr '17 - Nov '19
Intelligent Robots Ltd — London, UK

- Designed the **sensing**, **navigation** and **control** software stack (C++, Python) that allowed our robots to navigate highly unstructured warehouse environments.
- Developed **machine learning models** for object detection and tracking in warehouse environments (PyTorch, Tensorflow, Python, GCP)
- Oversaw the **development** and **deployment** of a three generations of autonomous mobile robot platforms working closely with contract manufacturing partners.
- Created a **novel** cart docking/undocking method which **decreased** the pickup and drop off time of carts by **75%**.
- Executed a **successful** Innovate UK **grant project** valued at £100K, delivering and deploying an innovative autonomous robot fleet.

EDUCATION

PhD,Computer Science — Dec '12 - Jul '17
University of Liverpool — UK

- **Thesis title**: "Multi-robot Collaborative Visual Navigation with Micro Aerial Vehicles"
- Developed a **partially distributed**, **multi-robot** visual localisation and mapping framework which allows teams of **aerial vehicles** to autonomously explore previously unknown environments in collaboration with one another
- **Published papers** at top robotics venues such as **IROS**, **TAROS, CADE** and **ARW**

B.S.c.(Honours),Computer Information Systems (1st Class) — Oct '09 - Dec '12
University of Liverpool — UK

- **Thesis title**: "Simplified Temporal Resolution using SAT Solvers"
- Developed an **automated solver** for **Propositional Linear Temporal Logic** (PLTL) based on a simplified calculus with satisfiability (SAT)-solver as a propositional back-end
- Graduated with a First Class degree and an **overall average of 90%**.

CONTACT

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SUMMARY

I'm a lead engineer and researcher with 10 years experience developing and deploying robotics, computer vision and machine learning products in challenging sectors from logistics to food tech. I'm experienced as an individual contributor with significant breadth of technical knowledge and skills. I have also grown and led several multidisciplinary engineering departments, hiring, managing and mentoring teams as large as 16 people.

Strengths

- **Computer Vision**
- **Complex Problem Solving**
- **System Architecture**
- **Software Engineering**
- **Leadership**
- **Team Building**
- **Mentoring**

TECHNICAL SKILLS

- C/C++
- Python
- Tensorflow
- PyTorch
- GCP
- SQL
- Docker
- ROS 1 & ROS 2.0
- OpenCV
- Git