

# Tom Milner

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## PERSONAL PROFILE

I am an engineer with 10 years of experience developing software across a range of programming languages and stacks, for industrial, academic, and personal projects. I have lots of experience in team-based roles and I am friendly, hard-working, and punctual. I have won scholarships and awards for both academic and business achievements, and I pride myself on my communication skills and willingness to learn new skills.

## EDUCATION

### **MECHATRONICS AND ROBOTICS MSC(ENG), UNIVERSITY OF LEEDS, 2024 – 2025**

- Academic Scholarship.
- Expected **Distinction** (80% average).
- Designed and prototyped a literature-leading robot for traversing small-diameter underground pipes.
- Top performing modules: Engineering Computational Methods (91%), Embedded Microprocessor System Design (86%), FPGA System Design (85%), AI and Biomechatronics (80%).

### **ELECTRONICS AND COMPUTER ENGINEERING BENG, UNIVERSITY OF LEEDS, 2020 - 2024**

- Academic Scholarship.
- **First Class** (79%) grade, coming top of the 2024 cohort.
- Top performing modules: FPGA Design (79%), Embedded Systems (79%), Digital Comms (92%), Compiler Design (97%), User Interfaces (88%), Circuit Design (79%), C Programming (99%).

### **A-LEVELS, GCSES CHURCHER'S COLLEGE, 2018 - 2020**

- A-Levels: Mathematics (A\*), Computer Science (A\*), Physics (A).
- GCSES: Three 9s, two 8s, five 7s.

## RELEVANT WORK EXPERIENCE

### **SOFTWARE ENGINEERING PLACEMENT, OC ROBOTICS (GE AEROSPACE), July 2022 – July 2023**

- Contributed embedded **C, C++, Python**, and **JavaScript** to the core codebases of “snake arm” robots.
- Wrote deployment and tooling for Linux (**bash**) and Windows (**PowerShell**) systems.
- Presented and demonstrated software solutions to non-technical personnel.
- Optimised a camera calibration workflow to run 12x faster.
- Diagnosed and debugged complex multithreaded bugs in the robot’s core OS.
- Earned 5 GE Impact Awards over the year for various software contributions to the company.
- Designed, built, and maintained a piece of python-based deployment software that became a core technology.
- Learnt **Agile project management** techniques in the form of sprints, stand-ups, and Kanban boards (Jira).

### **SOFTWARE SUPPORT ANALYST, CRISP THINKING, June 2021 – April 2022**

- Contributed to the **.NET C#**-based internal tooling.
- Wrote **Xpath**-based web scraping tools.
- Improved developer workflow by devising a **Git** strategy to organise individuals’ contributions.
- Modularised and refactored codebase following clean code principles (SOLID).

### **FULL STACK DEVELOPER, FREELANCE, March 2019 - September 2020**

- Communicated with clients to determine project scope and budget.
- Built a web-based registration portal for sixth form students to sign in and out of the premises.
- Built a web-based appointment management system for a local counselling firm.
- Utilised **Vue.js** for the front end, using **SCSS**, **HTML5**, and **Vuex** for state management.
- Utilised **Node.js** for the backend, using **Express** and **MongoDB**, hosted on VPS services, monitored with **DataDog**, CI/CD using **Github Webhooks** and **PM2**.
- Implemented **OAuth authorization** flows.

## PERSONAL PROJECTS

### **SPOTIFY DESKTOP WALLPAPER GENERATOR, PYTHON**

Built a Python CLI application to generate desktop wallpapers for my PC based on my Spotify activity. The program connects to the Spotify Web API and fetches my top 50 tracks over the last few weeks. Then, it fetches corresponding album artwork for each track and stitches them together into a collage, before setting the image as my desktop background. Using Cron, the program is run daily and has been in use for 4 years.

### **MOOD TRACKING APP, FLUTTER**

Developed a mood tracking mobile application to learn Flutter. Learn how to separate Flutter UIs into pages and widgets, and how to use BLoCs to manage state and separate business logic from UI logic. An SQLite database was used for storage. Tested on an android mobile phone.

### **PHILIPS HUE LIGHT CONTROL APP, ELECTRON, VUE.JS**

Built an Electron app to control Wi-Fi-enabled Philips Hue lightbulbs. The application communicated to the bulbs via the Philips Bridge API, and allowed the setting of different ‘scenes’, as well as the control of the colour and intensity of individual lights.

### **SPOTIFY-SYNCHRONISED LED STRIPS, GO, C++, ESP32**

Built a system to synchronise the intensity and colour of multiple LED strips to a user’s currently playing Spotify content. A single Go “Gateway” server runs on a PC. It connects to the Spotify Web API, authenticates using OAuth2, and downloads the album cover art and timestamped “beats” and “bars” of the currently playing track. The Go server computes the dominant colour of the album art, before broadcasting it (and the beat information) via MQTT to C++ “Edge” applications running on ESP32s. Each ESP32 uses the beat and colour information to pulse an LED strip in time with the music, setting the lights to the same colour as the album art.

### **AI-BASED ACTIVITY DETECTION (UNIVERSITY PROJECT), MATLAB**

Used an IMU sensor belt to record the movement of a patient performing various activities (walking, sitting, standing, jumping etc). Trained **ANN, SVM, and CNN machine learning models** on the data to determine a patient’s current activity status using the sensor belt. Data analysis was performed to identify the most significant sensor position on the belt for classifying movement activities, as well as the most useful data points, resulting in a classification accuracy of 95%. The project was awarded a mark of 80%.

## TECHNICAL SKILLS

**WEB TECHNOLOGIES:** JavaScript, Vue.js, Vuex, Node.js, SCSS, Express, Auth flow patterns, HTML5.

**SOFTWARE:** Python, C, C++, Java, C#, Unix, MATLAB, Machine Learning, Flutter

**ELECTRONICS:** Digital Signal Processing, Embedded System Design, FPGAs, Verilog.

**MECHANICAL DESIGN:** CAD (Fusion 360), FDM Printing and Prototyping.

**SOFT SKILLS:** Presenting to Non-Technical Audiences, Technical Report Writing, Market Research, Product Pitching.

## AWARDS AND ACHIEVEMENTS

### **SPARK ENTERPRISE SCHOLARSHIP, UNIVERSITY OF LEEDS, 2024**

Started an audio electronics-based business venture, which I pitched to investors and won seed funding and mentorship.

### **SPARK BUSINESS PLAN PRIZE, 1<sup>ST</sup> PLACE (PRE-TRADING), UNIVERSITY OF LEEDS, 2024**

Developed a business plan for a product in the homeware industry. Pitched the business in a city-wide enterprise competition and placed 1<sup>st</sup> in the competition, winning seed funding and mentorship.

### **1<sup>ST</sup> PLACE 2018, 2<sup>ND</sup> PLACE 2019, CYBERQUEST**

### **1<sup>ST</sup> PLACE 2018, 2<sup>ND</sup> PLACE 2019, CODEQUEST, LOCKHEED MARTIN**

CyberQuest and CodeQuest are national cybersecurity and coding competitions run by Lockheed Martin. In each competition, my team came 1<sup>st</sup> in 2018 and 2<sup>nd</sup> in 2019.

## INTERESTS Live music and playing guitar.