GEORGE HAWORTH MSC MIET

Controls Software Engineer

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LinkedIn
Github
Personal Projects

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I have over 10 years hands-on experience developing and commissioning embedded control systems software, spanning embedded microcontrollers, industrial PLCs, and now exploring FPGAs. My formal mathematics background provides a strong foundation for control systems algorithm development, while my commitment to continual professional development over the years has equipped me with a diverse range of technical skills. I excel and am most fulfilled when applying first-principles thinking to take ownership of challenging technical projects requiring deep, focused work. I am seeking a development role focused on full life cycle product design where my educational and professional experience can create maximum value.

KEY SKILLS

CONTROL SYSTEMS ALGORITHM DEVELOPMENT AND IMPLEMENTATION

PROGRAMMING LANGUAGES: C/C++, RUST, PYTHON

IEC 61131-3 PLC/HMI PROGRAMMING: SIEMENS, MITSUBISHI, CODESYS

COMMUNICATION PROTOCOLS: PROFINET, PROFIBUS, MODBUS, ETHERNET

MATLAB/SIMULINK: PROCESS MODELLING, PID CONTROLLER DESIGN, AUTOMATIC CODE GENERATION

FPGA DEVELOPMENT: VHDL, VERILOG, RUSTHDL

EMPLOYMENT

WESSEX WATER SERVICES LTD
Automation Engineer (Contractor) | May 2022 to Present

- Developed, tested and commissioned embedded control software (using Siemens and Mitsubishi platforms) for critical infrastructure systems.
- Created detailed process simulation code to test and verify system performance before deployment.
- Implemented comprehensive test methodologies including unit testing of individual control modules, regression testing to ensure changes don't affect existing functionality, and system-level acceptance testing during commissioning (FAT/SAT).
- Produced thorough technical documentation including User Requirement Specifications.
- Collaborated with multi-disciplinary engineering teams throughout design and commissioning phases.
- Led the software development of Wessex Water's first servo-driven alkalinity dosing system, collaborating with a third-party company to successfully implement the screw-feed mechanism.
- Implemented and tested communication protocols for telemetry reporting and inter-PLC communications, verifying reliable data transmission between field systems and central monitoring platforms.

ROBUST AE LTD
Control Systems Engineer | March 2018 to Present

- Designed, programmed, and commissioned complete control systems for urban vertical farms using Siemens S7-1200 PLCs, implementing automated control of pumps, fans, grow lights, with integrated level monitoring and leak detection systems.
- Designed and implemented embedded microcontroller-based control systems, including custom smart shelving systems for industrial laundry applications which improved sorting efficiency by 3-4x.
- Designed and implemented safety-critical control systems such as safety interlocks and emergency shutdown controls for agricultural and industrial facilities, ensuring compliance with relevant standards (IEC 61508, BS7671, etc).
- Performed electrical installation testing, inspection, and fault diagnosis across a wide range of industrial installations and machinery.

SELF-EMPLOYED
Embedded Systems Engineer | June 2013 to March 2018

- Provided bespoke control system projects for a variety of different clients.
- Designed and tested embedded software for Arduino-based control systems.
- Developed signal processing algorithms for a project with the International Conference on New Interfaces for Musical Expression to produce musical bicycles using Beaglebone single board computers.
- Development of a microcontroller based automated fish feeder in collaboration with Green Lab London.

KAGYU SAMYE LING
Volunteer | Jan 2010 to Present

- Provided electrical installation services for various centres including the renovation of a former public library in London into a Buddhist centre, the Kagyu Samye Ling main centre in Scotland, and a hydroelectric generation scheme.

LINEDATA (BFT) LTD
Release Analyst | Dec 2005 to Nov 2009

- Worked in the test and release department as part of a software development team in the hedge fund industry.
- Developed familiarity with SQL databases, and acquired an understanding of the software development lifecycle and best practices.

ACADEMIC EDUCATION

UNIVERSITY OF CAMBRIDGE ONLINE
Control Engineering | Nov 2023

- Advanced control systems engineering course focussing on process control modelling using MATLAB/Simulink.
- Comprehensive study of PID and model-based controller design, with emphasis on robust controller design.
- Practical implementation challenges including deadzone compensation, rate limiting optimisation, and anti-windup strategies.

GOLDSMITHS COLLEGE, UNIVERSITY OF LONDON
MSc Computing | 2016 | GPA: Distinction

- Gained expertise in algorithm design and implementation for embedded systems (Arduino, Raspberry Pi, Beagleboard) using C/C++ .
- Dissertation focused on developing a hardware audio effect processor, involving real-time signal processing algorithms.
- Served as the student representative for Computing department masters students.

LOUGHBOROUGH UNIVERSITY
BSc (Hons) Mathematics | 2004 | GPA: 2:1

- Strong foundation in analytical problem solving and quantitative reasoning essential for optimizing control system algorithms and troubleshooting complex embedded implementations.
- Final project in mathematical modelling of neural systems developed skills in algorithm analysis directly applicable to embedded control system design and implementation.
- Mathematical rigour provides a structured approach to designing robust control systems, validating algorithms, and ensuring deterministic behaviour in safety-critical implementations.

ENGINEERING INSTITUTE OF TECHNOLOGY (EIT)
Advanced Diploma of Industrial Automation | 2023 | GPA: 97%

- Practical-focused course covering instrumentation, PLC programming, process control/modelling, communication networks, safety systems, circuit board design, IoT systems, SCADA systems, motor protection, control valve sizing, power distribution and more.
- Accredited by the Institution of Engineering and Technology (IET) in the UK.

LOUGHBOROUGH UNIVERSITY
Science and Engineering Foundation Studies | 2001 | GPA: 1st Class

- Foundation studies in mathematics, physics, engineering, and design principles.
- Provided me with a firm grounding in systematic analytical methods and technical problem-solving skills fundamental to embedded systems development.

LICENSES AND CERTIFICATIONS

C/C++ PART 2 - OBJECT ORIENTED PROGRAMMING USING C++: CITY ST GEORGE’S, UNIVERSITY OF LONDON
Dec 2022

C/C++ PART 1 - PROGRAMMING WITH C: CITY ST GEORGE’S, UNIVERSITY OF LONDON
Dec 2020

INTRODUCTION TO MACHINE LEARNING WITH PYTHON: GOLDSMITHS COLLEGE, UNIVERSITY OF LONDON
Jul 2022

DIGITAL AND WIRELESS COMMUNICATIONS: UNIVERSITY OF OXFORD, DEPARTMENT FOR CONTINUING EDUCATION
Nov 2021

CERTIFIED PROFINET ENGINEER AND INSTALLER, PROFIBUS & PROFINET INTERNATIONAL
May 2022

CITY AND GUILDS LEVEL 3 AWARD: SIEMENS TIA PORTAL PLC INDUSTRIAL MAINTENANCE & FAULT FINDING PROFESSIONAL & EAL LEVEL 1&2 AWARD: SIEMENS INDUSTRIAL PLC MAINTENANCE & FAULT FINDING PROFESSIONAL

ELECTRICAL CERTIFICATIONS: BS 7671:2018 (2382-18), BS 7671: 2008 (2015) (2382-15), (2393-10), (2377-22/23), (2919-01), EAL LEVEL 3 600/4337/4 & 600/4338/6

PERSONAL PROJECTS

FPGA BASED HARDWARE MIDI SEQUENCER/SYNTHESIZER
Current

- Developing a hardware MIDI tracker sequencer and synthesizer using RustHDL and a Xilinx FPGA development board (Digilent Basys 3), implementing digital signal processing algorithms that leverage my control systems expertise at a more granular hardware level while building practical HDL skills.