

JOHN WELFORD MEng CEng MIET

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GOAL

A career in automotive engineering, specialising in mechatronics and applying systems engineering skills.

Develop system models and visualisations to effectively communicate engineering and science to both industry professionals and the general public.

EDUCATION



The Institution of
Engineering and Technology

CEng: Chartered Engineer



The University of Manchester

PhD: Mechatronics - Electric actuator technologies
and design processes



The University of Bath

PGC: Management



The University of Sheffield

MEng: Electronic, Systems and Control Engineering
(1st)



Worcester Sixth form College

A-Level's: Mathematics (A), Physics (A), Technology (B),
Computing (B)



Nunnery Wood High School
Worcester

10 GCSE's: Grades A* to B

CAREER



Cummins Turbo Technologies (2010 – present). Sponsored PhD student working closely with the Cummins Mechatronics team, time split between Cummins offices in Huddersfield and Manchester University.

Research into electric actuator design methodologies for use with Cummins variable geometry turbochargers. Focused on the actuator design process, particularly the modelling and selection of a brushless motor and gear train combination. This included: actuator requirements specification; tools for quickly assessing motor and gear capabilities; tests for parameterising candidate motors; electromagnetic, mechanical and thermal modelling; model validation processes; and control schemes for positioning control. Motor and full actuator testtrigs were designed and constructed. Microchip PIC code written to implement control schemes and drive test motors. Resulted in two IET conference publications. Results fed back to influence Cummins design processes.

Involved in discussions and investigations on: inertia damping of exhaust pulsations in variable geometry linkages; vacuum actuator modelling; waste heat recovery electric machine design; and new product control schemes.

Provided support and advice to 4 separate MSc student projects.

Actively involved in a lectures, seminars and lab classes within Manchester University Power Conversion group.

QinetiQ (2004 – 2010). Worked predominantly within the Sensors and Algorithms capability in the Guided Weapons domain.

Technical Lead and Systems Engineer for two major programmes of work. Led teams developing algorithms and integrating them into a demonstrator used in live flight trials. Regular liaison with partner companies and the customer.

Led several tasks, and contributed a significant amount of the technical work, to capture and process imagery to produce 3D tracking for two world first high speed impact trials. Established a process to repeat the task at future trials. The success of the work secured involvement in subsequent trials. Technical work published in an IET conference.

Other technical work included: Target Tracking, Data Fusion, Lethality Modelling/Optimisation, Guidance, System Modelling, Autonomy, Simulation, Performance Assessment. Additional work on high altitude Uninhabited Air Vehicle (UAV) systems.

SKILLS

Leadership	Technical	Leadership of large programmes of work, building a team, assigning work, directing development and liaising with other project teams.
	Management	Experienced in bidding, tasking, resourcing and delivering milestones.
Reporting	Documents	Several in depth technical/customer oriented reports and bid documents produced; using a variety of packages including Microsoft Office, Open Office and LaTeX.
	Presentation	Presented at international conferences, and to a range of audiences on a variety of subjects.
Modelling	SysML	A knowledge of, and interest in the adoption of, the Systems Modelling Language (derived from UML). Experience using the Sparx Systems Enterprise Architect modelling tool for project architecting.
	Simulink	Experience creating large models, simulating physical systems in the mechanical, electrical, thermal and control domains. Several third party libraries used including SimScape and Simulink Coder.
Programming	Matlab	Considerable Matlab experience for a wide range of uses, including numerous toolboxes.
	Microchip C	Development of C code for implementation on Microchip dsPIC devices.
Language Skills	French	Basic French, (GCSE and numerous holidays to French speaking countries).
	German	Basic German (GCSE and University courses).
Mentoring/ Outreach	STEM Ambassador	Work with local schools on a wide variety of projects as a STEM Ambassador (Science, Technology, Engineering, Mathematics).

INTERESTS

Mountain biking
Snowboarding

Automotive tinkering
Adventuring

Hacking / DIY