

Dr JOHN WELFORD PHD CENG MIET MINCOSE

john.welford@gmail.com

www.extuitive.co.uk

+64 (0)22 4963513

GOAL

To aid the development of future infrastructure solutions by advancing systems engineering methods within businesses and projects.

EXPERTISE

| | |
|---------------|---|
| Systems | Requirements. Architectures. Configuration Management. Test. |
| Communication | Documentation. Data publication. Interactive visualisation. |
| Modelling | System, mechanical, electrical, thermal and control domains. |
| Mechatronics | Actuator design, development and test. Control system design. |

CAREER



WSP

(2014 – present)

Systems Engineering and Integration for a number of heavy, light and high-speed rail programmes.

Systems Engineering manager in the C7 Alliance for the Auckland City Rail Link project.

Systems Engineering lead for the Gawler Rail Electrification project.

Work with Public Transport Victoria to develop their systems engineering capabilities, in particular using model-based systems engineering methods.

Led a team to deliver configuration management consultancy the RTA in Dubai.

Production of system architectures and diagrams for Network Rail North of England, High Speed 2, and Transport for Greater Manchester Metrolink tram networks.

Led internal systems engineering framework development to produce reusable tools, processes and capabilities.



Cummins Turbo

Technologies (2010 – 2014)

Sponsored PhD student working closely with the Mechatronics team.

Research on electric actuator design methodologies for variable geometry turbochargers. Focused on the actuator design process, particularly the modelling and selection of brushless motor and gear train combinations.

Including: tools for assessing motor and gear capabilities; tests to parameterise candidate motors; multi-domain modelling; model validation; positioning control schemes; prototype construction and test; microcontroller coding.



QinetiQ

(2004 – 2010)

Defence engineering research, within the Sensors and Algorithms capability in the Guided Weapons domain.

Technical Lead and Systems Engineer for major programmes of work.

Led teams developing algorithms and integrating a live flight demonstrator.

Lead technical researcher on 3D tracking for two world first high speed impact trials.

Technical work including: target tracking; data fusion; lethality optimisation; guidance; system modelling and simulation; autonomy; performance assessment; and work on high altitude Uninhabited Air Vehicle (UAV) systems.

EDUCATION



The Institution of Engineering and Technology (2010)

CEng: Chartered Engineer



The University of Manchester (2010 – 2014)

PhD: Mechatronics – Electric actuator technologies and design processes



The University of Bath (2005 – 2007)

PGC: Management



The University of Sheffield (2000 – 2004)

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

PROFESSIONAL SKILLS

| | |
|-----------------------------|---|
| Technical leadership | Leadership of large programmes of work, building a team, assigning work, directing development and liaising with other project teams. |
| Management | Experienced bidding, tasking, resourcing and delivering to milestones. |
| Documentation | Many in-depth technical/customer-oriented reports and bid documents produced; using a variety of packages including Microsoft Office, Libre Office, LaTeX and HTML. |
| Presentation | Presented at international conferences, and to a range of audiences on a variety of subjects. |

TECHNICAL COMPETENCIES

| | |
|-------------------|---|
| MBSE | Model Based Systems Engineering (MBSE) including SysML and LML languages and the use of Visio and Enterprise Architect tools. |
| Simulation | Experienced creating large dynamic physical simulations using Matlab, Simulink and third party libraries and toolboxes. |
| Coding | Algorithm design and coding for experimentation, modelling, data analysis and data presentation using Matlab, VBA and Javascript. |
| Hardware | Design and construction of test and demonstration equipment. Development of real-time C code for Arduino and Microchip devices. |

COMMUNICATION

| | |
|------------------------|---|
| Languages | Basic French and German (supported by numerous holidays). |
| STEM Ambassador | Voluntary work with local schools on a wide variety of projects as a STEM Ambassador (Science, Technology, Engineering, Mathematics). Activities developed adopted for use at a regional level. |
| Mentoring | Mentor to junior engineers progressing on the route to chartership, and students studying engineering. |

PUBLICATIONS

| | |
|----------------------------|--|
| Conference articles | Several papers authored on the the subjects of mechatronics and systems engineering. |
| Blog posts | Regular internal technical posts sharing knowledge and experience. |
| Data visualisation | Static and interactive presentation of data for both analysis and effective information publication. |