

Stuart Walker

PhD MEng MIMechE
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PhD qualified Chartered Mechanical Engineer with post-doctoral and commercial experience.
Strong interest in renewable energy and the environment, and a real passion for engineering.

Skills:

- **Experimentation:** Structural and Fluid dynamic measurement with laser, optical, ultrasonic and acoustic methods.
- **Computing:** Programming with Matlab and Python, LabVIEW, Finite Element and Computational Fluid Dynamics, CAD, LaTeX. Comfortable in Windows and Linux.
- **Communication:** Peer-reviewed journal papers, international conferences, commercial reports, presentations to large audiences, public engagement & media.

Experience:

Researcher in Low Carbon Product Design and Development, University of Derby - Sept. 18 to present

Multi-skilled low carbon consultant on ERDF-funded project at the Institute for Innovation in Sustainable Engineering. Reducing carbon emissions of Small and Medium sized enterprises in the Derbyshire region. A diverse range of projects including:

- Development of machine learning system to identify and classify features from UAV photography
- Mathematical and computational modelling of an in-stream hydroelectric generator
- Development of low U-value windows for PassivHaus use (including full life cycle assessment)
- Design and testing of a prototype small-scale energy generation system (currently at TRL 2)
- Monitoring and sensor development of drinks manufacturing site to reuse waste process energy

This work requires academic rigour, commercial awareness, meeting deadlines excellent communication. I also continue to work on Tidal Turbine fatigue analysis, co-supervise two PhD students, produce journal articles and Impact Case Studies, and am an active member of the Early Career Researcher network.

Post-Doctoral Researcher in Structural Dynamics, University of Sheffield - Jan. 17 to Aug. 18

Part of the University of Sheffield Dynamics Research Group, I was the lead experimental researcher on the S^3 – *Disease Surveillance for Systems and Structures* project, under Prof. Keith Worden.

Carried out experimental and computational work, including full experimental and day-to-day responsibility for a scanning laser vibrometer, experimental testing using optical, accelerometer and force measurements, and Finite Element model development and updating. This work was presented at the ISMA2018 conference.

Chalet Manager (Winter) & Resort Manager (Summer) - Dec. 15 to Oct. 16

Planned career break after post-doctoral fellowship. With my wife I managed a remote 25-bed chalet in winter and three self-catered chalets in summer. Developed customer service, advanced driving, improved French and German language skills.

EPSRC Doctoral Prize Researcher, University of Sheffield - Dec. 14 to Dec. 15

Awarded a prestigious 12 month EPSRC fellowship to continue tidal turbine research. This was undertaken between the University of Florence and the University of Sheffield.

Major achievements included the design and construction of low cost scale turbine models with speed and power instrumentation; characterisation of large water channel to understand boundary layer and turbulence; flow data measurement using ultrasonic and laser systems and statistical analysis in Matlab. I also built a Computational Fluid Dynamics (CFD) model and studied turbulence results using Q criterion and vorticity. Work was presented at two European conferences in 2015 and published in 2017.

PhD Researcher, University of Sheffield - Sept. 10 to Dec. 14

Title: '*Hydrodynamic interactions of a Tidal Stream Turbine and Support Structure*'

Part of the University of Sheffield E-Futures Doctoral Training Program, including a taught first year studying the current, historical and forecast UK and global energy and resource use and demand, fossil, nuclear and

renewable energy. I learned how to review literature, developed my understanding of tidal power (resource, technology, economics), developed a collaboration with a device manufacturer, used numerous flow measurement methods and gained experience in signal and image processing. I was also successful in applying for EU FP7 funding and published three journal articles.

Life Cycle Assessment project with TATA Steel - Sept. 10 to Dec. 15

Continued collaboration after initial work during the first year of my PhD. Published study of embodied energy of Tidal energy devices using commercial software (GaBi) and self-developed linked spreadsheet tool using Visual Basic. Secondary stage on the impact of Circular Economy principals to part design and reuse resulted in a further journal publication and continued collaboration with TATA Steel.

Graduate Consultant, AECOM Advanced Design Group - Sept. 07 to Sept. 10

Member of a specialist team within the AECOM Buildings Division. Main responsibilities:

- Energy demand modelling and energy planning at building scale
- Part of masterplan design teams on energy, water and transport layout (e.g. Qatar 2022 World Cup bid)
- Computational modelling for building regulation compliance, using dynamic thermal modelling
- CFD analysis for external wind assessment and internal airflow analysis (full project management)
- Presentations and reports for clients, design teams, planning authorities
- Managed two members of staff when project workload required

Ski Instructor (Snowsport England qualified Club Instructor), Sheffield Ski Village - Sept. 04 to Oct. 05

Part-time role during undergraduate degree. Planned and delivered lessons to clients of all ages.

Manufacturing Engineer, Labman Automation - May to Sept. 04

Assisted in the design and construction of robotic systems for commercial and academic applications.

Design Engineer, BioGene Research - May to Sept. 02 & 03

Part of a small team working on the prototype design of DNA testing equipment. Developed a full construction and assembly guide to allow subsequent batch manufacturing.

Publications

- **Journal articles:** Publications in peer-reviewed journals including IMechE Part M, Sustainability, Environment and Behavior. Regular journal reviewer. NB: Full academic CV available.
- **Presentations:** International, European and UK conference presentations, poster presentations (recent award winner), and regular speaker at Public Engagement and STEM events.

Funding Awards

- **Marinet 2 (April 2018):** Three weeks' laboratory access at University of Florence
- **Urban Flows Observatory Sensor Design Competition (Feb. 2018):** Awarded £1000 to develop prototype sensors.
- **Engineering Researcher Society DO fund (Feb. 2018):** Small grant for part manufacture
- **MaRINET (June 2015):** Funding awarded to access large facility at the University of Florence.

Previous Education

- **MEng Mechanical Engineering (2:1) - July 07**
University of Sheffield
- **Stokesley School & 6th Form College - July 03**
A Levels: Design Technology (A) Maths (B); Physics (B). AS Levels: General Studies (A); German (C)
GCSEs: 10 at A*-B inc. Maths (A), English (A*/ A) and Science (A*)

Further Details

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