

Sylvain Boyer, PhD, MIET

+44 7498 332236

sylvain.w.o.boyer@gmail.com

Prototype and complex system engineering

Ph.D. Mechanical Engineering, Specialized in Acoustics and Vibrations and Measurement Systems

Member of Institute of Engineering and Technology (MIET)

<http://ca.linkedin.com/in/boyersylvain>

Specializations: Design of instrumentation, acoustics and vibrations

- Instrumentation design and Metrology
- Vibration and acoustics measurements and modeling using FEM, noise calculation
- CAD modelling: SOLIDWORKS, FUSION 360 (inc. Eagle PCB, Simulation)
- Project Management, costing and system engineering.
- Finite Element Analysis: COMSOL Multiphysics (6.x, 5.x, 4.x), NASTRAN
- MATLAB/Simulink (support package for Arduino and Raspberry Pi)
- MATLAB App development
- Electronic design and simulation: LT Spice, Eagle PCB
- Coding: C/C++/Python
- Arduino/Raspberry Pi
- Training, Mentoring and Coaching

Professional experience

Senior Electromechanical Engineer – Building Research Establishment (BRE Group), United Kingdom 2023 – present

- Led the design, development, and implementation** of advanced bespoke electromechanical systems to enhance and expand the testing capabilities of the FDET Certification Department. Bespoke systems include Shock and vibration test fixture, flash rate detection systems for user interface testing, 5-phase stepper analog driver for precision turn table
- Planned and managed projects end-to-end**, including defining requirements, sourcing manufacturers, raising quotations, and ensuring timely delivery of systems and components.
- Optimized design workflows and implement best practice for product development**, by implementing Product Data Management, Documentation, and simulation as part of the design work.
- Developed and improved calculation spreadsheets and Standalone applications**, to automate measurement processing while reducing manual file manipulation.
- Trained** testing lab technicians (team of 15 people) with new bespoke equipment, procedures, calculators and software I am designing.
- Defined lab budgets and future development costs (£ 1M overall)**, providing management with accurate forecasts to support budget requests and strategic planning.

Instrumentation Engineer - National Physical Laboratory, United Kingdom 2017 – 2023

- Led the development of bespoke electromechanical prototypes for internal customers**, with key projects such as a silicon wafer scanner and a thermoregulated chamber for precision interferometry measurements.
- Represented NPL** at the European Society for Precision Engineering and Nanotechnology and presented my research on developing a thermoregulated chamber for high precision interferometry.
- Developed and applied expert technical skills** in various domain, from CAD design to embedded software:
 - Designed and assembled from scratch the Microwave silicon wafer scanner, source components from various suppliers to meet constraint budget and deadlines. Led a team of 4 engineers and project manager. <https://www.npl.co.uk/products-services/graphene-2d-materials/microwave-resonator>
 - Designed and build an autonomous thermoregulated chamber controlled at 20mK for couple of hours in a thermally uncontrolled room: this include defining the methodology to design the overall electromechanical system with tuneable control software. Developed embedded electronic including embedded software in C/C++ and MATLAB Simulink. Carried out system identification, define and tune control system loops...

Mentored junior and senior engineers involved on the project for a short period of time (one to three months). 80% of the project was carried out alone.

- Developed bespoke systems, including a water cooled heatsink for an ion trap system, and a laser diode array heatsink for laser diode characterisation.
- Developed numerical models (contact modelling and heat transfer) for an atomic clock wave guide (<https://www.npl.co.uk/products-services/time-frequency/optical-reference-cavity-for-space-applications>)
- Developed and provided an internal consultancy service of ground vibration measurement for NPL laboratories.
- **Provided expert consultancy** in acoustics and vibration to internal and external customers.
- **Designed and delivered 3-day engineering workshop** for two 16-year-old A-level students, covering the complete product development cycle: design specification, technical documentation, risk assessment, CAD drawing, concept development, and FEM analysis demonstrations
- **Promoted** my technical expertise and **initiated** consultancy contract with internal and external customers.
- **Led** and participated in **bids, project costing, and risk assessments** for commercial products in accordance with European machinery directives.
- **Implemented** risk assessment for commercial equipment following ISO 12100

Acoustics Consultant - AECOM, London, United Kingdom 2016 - 2017

- Carried out noise consultancy ranging from noise and vibration monitoring for environmental impact assessments (EIA), to building acoustics and construction monitoring: Crossrail, MET Police, Viridor, London Underground, Al-Adma-Opco, UAE, Ballymore, piling work monitoring across London.
- **Led the tender for “La Cité du Théâtre de Paris”, 2017 – (total estimated cost: circa 150m€).** Teaming up with Architecture Back Caclin Studio (France), and Team up with and Axel Schoenert Architectes (France).

Doctorate in mechanical engineering – Acoustics and vibrations 2010-2015 **École de Technologie Supérieure & IRSST, Montréal, Canada** **“Study of the sound transmission through earmuffs”**

- Developed a predictive FEM model of two commercial earmuffs (3M brand).
- Validated the numerical model using experimental acoustic measurements.
- Used the model and measurements data for to propose technical innovations and inspire future research.
- Published and presented the research in peer reviewed journals and international conferences
- **Actively looked for additional source of revenue**, by taking part of popular science contests, grant programs for post graduate students, and athletic scholarship.

Research intern - National Oceanography Centre Southampton, United-Kingdom 2008-2009 **Development of a pH spectrophotometric sensor (acidity sensor) for seawater**

- Developed a low cost – low power autonomous pH Sensor for sea water measurement

Academic Background

- 2015 – PhD. in Mechanical Engineering, Acoustics and Vibration, École de Technologie Supérieure, Montréal
- 2009 – Master's degree, École Nationale Supérieure d'Ingénieurs du Mans (ENSIM), France.
with 6-month ERASMUS at the Institute of Sound and Vibration Research (ISVR) Southampton

Other

- Google Scholar: <https://scholar.google.com/citations?user=7AJNNbMAAAAJ&hl=en>
- ResearchGate: <https://www.researchgate.net/profile/Sylvain-Boyer>
- GitHub: <https://github.com/sylvanoMTL>
- Website: <https://www.the-frog.fr/>
- Sport: competitive rowing, including national championships podiums and gold medals, Royal Henley Regatta, Royal Canadian Henley Regatta (2014 lightweight men single sprint), and World Rowing Coastal Championships, Commonwealth Beach Sprints 2018. (Includes funding request, logistics, boat hiring, kit supplier sourcing...)
- Coaching athletes of various levels: Niveau 1 – Initiateur Federal – Aviron France
- Crafting ideas in electronic, software, woodworking and 3D additive manufacturing.
- Contributing to technical forum and servers and tutoring on demand.