

# John Joyce

**Born:** 22nd May 1973

**Nationality:** British

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## Profile

A practical, hands-on, adaptable electrical engineer with a wide range of skills and experience. Eight years of employment in both large and small companies, and also in academia. PhD from Cambridge University.

## Skills and Experience

- Extensive electronics lab experience including high voltage and high power test rigs, from conception and design to construction and use. Test automation using combinations of off-the-shelf instrumentation and bespoke designs. Use of a range of electrical and electronic measurement tools and techniques. Basic mechanical and workshop skills. Electronic hardware design, prototyping and construction, including basic embedded control.
- Programming in LabView, VB.NET, VBA, C, BASIC, various assemblers including ARM, 6502, and PIC.
- Simulation of semiconductor devices using the Silvaco finite element software suite. Circuit simulation using SABER and PSPICE. System simulation using Simulink.
- Undergraduate tuition and lab demonstrations. Proof-reading of M.Phil. and Ph.D. theses, and examination of M.Phil. theses over a range of engineering disciplines. Supervision of vacation students.

## Employment

**January 2003 to present. CamSemi**, a fabless semiconductor company designing mixed-signal SMPS control ICs for SMPS applications.

2006 to present: **Senior Test Engineer**. Developed CamSemi's Test Engineering group into a three-person team, which is responsible for characterising both mixed-signal CMOS ICs, and applications using them.

- Created test specifications for both internal and test development house use, in liaison with IC design and system design teams. Input to IC design from testability perspective.
- Acquired detailed understanding of IC implementations, and the systems within which they function, to enable test specifications to be produced
- Conception, design, production and commissioning of 'rack and stack' style ATE for testing both CamSemi ICs, and end applications using them
- Management of ATE software and hardware development by external contractors

- Assisted with debug of prototype silicon using a combination of bench and ATE test techniques

2003 to 2005: **Advanced Device Engineer** and then **Senior Power Device Engineer**. Responsibility focussed on practical aspects, including:

- Wafer level testing of power devices, including specification, purchase and commissioning of automated probestations, integration with test equipment, and software design and implementation to acquire and record data
- Processing and analysis of data to facilitate future design decisions
- Device performance assessment and comparison with competitors' devices
- Packaging and testing of engineering sample parts including circuit functionality
- Supervision of vacation students

September to November 2002. Short term contract **Research Associate** in **Cambridge University Engineering Department**

- Investigation of oscillations within IGBT modules using Silvaco mixed-mode (semiconductor device and circuit) simulation tools
- Undergraduate tuition and laboratory demonstrations.

September 2001 to August 2002. **Research Technologist** at **Alstom Research & Technology Centre**, Stafford.

- Design and construction of test rig for characterisation of high-power IGBTs
- Feasibility study of prototyping utility-scale energy storage and conditioning systems using ultracapacitors
- Characterisation of silicon carbide semiconductor devices
- IGBT modelling using SABER simulation package

April to November 2000 and April to August 2001. Contract **Research Assistant** in **Cambridge University Engineering Department**.

- IGBT modelling
- Current measurement techniques
- Measurement and simulation of IGBT operation under short circuit conditions

Co-authored two papers at international conferences and presented one. Undergraduate tuition and lab demonstrations.

## Education

1996 to 2001: Cambridge University Engineering Department. Studied for **PhD** under Dr. Patrick Palmer; sponsored by GEC Plessey Semiconductors, now Dynex Semiconductors. Graduated with thesis *Current Sharing and*

*Redistribution in High Power IGBT Modules*. Co-authored five papers at international conferences, and presented two of these.

1992 to 1996: Clare College, Cambridge. **B. A. (Hons) (1st)** and **M. Eng.** in Electrical and Information Sciences. Awarded the Pressed Steel Prize for Engineering.

1981 to 1991: The King's School, Chester, **A Levels:** Maths, Further Maths, Physics, Chemistry, and General Studies (all grade A); STEP (Cambridge supplementary exam) Maths and Chemistry (both grade 1) Awarded the Westminster Gold Medal for best A-level results.

## Activities

Volunteer on the Llangollen Railway since 1987. Currently restoring, maintaining and driving diesel railcars. Director of Llangollen Railcars Ltd, a company limited by guarantee with charitable status, which operates the fleet of 12 vehicles. Edited and typeset 23 quarterly issues of *Steam at Llangollen*, each around 25,000 words. Created the Railway's first website, and maintained it from 1997 to 2006.

Member of the Institution of Engineering and Technology.

Competitions Secretary of Cambridge University Automobile Club for two years and vice-president for one year. Organised club events including two 'Varsity' 12-car rallies and one 'National B' status navigational rally. Occasional entrant and marshal.

Junior Treasurer of Cambridge University Railway Club for three years and editor of their journal *Eagle* for one year.

Reasonable, if rusty, French. Basic Mandarin.

Enjoy travelling, both for work and leisure.