### Curriculum Vitae

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### OVERVIEW

I am a Contract Embedded Software and Hardware Design Engineer with a first class honours degree, my experience lying mainly within the medical device embedded system design field. Over the last ten years most of my experience has been in medical software development. I also have experience in analogue electronics in the area of signal interfacing/conditioning. Due to the breadth of my experience I am an excellent problem solver. More recently I have been managing my own Ltd Company, designing and selling my own embedded subsystem products, alongside contract design work for other companies.

### EMPLOYMENT HISTORY

**Oct 2008 to date Owner Blackwood Embedded Solutions Ltd (BES)**

* Running Design consultancy consisting of 9 engineers, on various customer projects.
* Design of first product a generic 32bit Fujitsu based MCU card, complete with safety features and protection components. Fully Internet capable. See [www.BlackwoodEmbeddedSolutions.co.uk](http://www.BlackwoodEmbeddedSolutions.co.uk) for more details. Including TCP/IP stack, Html, XML, Javascript.
* Gaining Business partnerships with Fujitsu Microelectronics Europe and IBM for my expertise and experience with their Microcontrollers and Rhapsody UML software products respectively.
* Running complete accounts and sourcing suitable suppliers and gaining discounts from component suppliers.
* Various contracts with multiple clients.
* Designing multiple boards for automotive customer
* Laying out various boards for automotive customer
* Hand building SMT prototype boards for medical customers
* Advising Medical customers on software design process.
* Reworking Medical prototype software to meet IEC62304 and CE and FDA510K approvals, including writing procedures, documentation, coding/code review (to remove SOUP), and testing, including software tool validation. (with additional BES engineer to maintain independence). Now launched and a multiple award-winning product.
* Rewriting HAL for class C medical product to remove SOUP and improved performance.
* Writing and performing test procedures for various medical clients
* Designing new product from scratch for financial Client, involved in electronic hardware design and full software design. Now launched and in trials with various national retailer customers.
* Training recent graduate on Go-wales scheme in embedded systems.
* Provision of an in-house project and mentoring for an “Access to Masters” student.
* Implementing ISO9001 in house and being recommended for certification with no non-conformances.
* Attending Medica exhibition on Welsh Trade Mission.
* Finalist for “Business of the Year (under 25 employees)” at Caerphilly business forum awards 2013
* Finalist for “Business of the Year (under 25 employees)” at Caerphilly business forum awards 2014
* Finalist and Winner of the Innovation category at Caerphilly Business Forum Awards 2014
* Designing portable wireless drug delivery system using BLE, including all electronics and firmware.

**June 2011 to September 2011 Contract with \*\*\*\* Ltd**

* **Reverse engineering assembler software**
* **Writing specifications**
* **Writing POST software in assembler for Atmel microcontroller.**

**April 2010 to 31st Jan 2011. Contract with \*\*\*.**

* Writing a USB bootloader for the ARM Cortex M3 for \*\*\* latest Product.
* Writing Test software for production test and soak test of units.
* Writing graphics display drivers.

**Sept 2009 to April 2010 Contract with \*\*\*\*\*\*\*\* Ltd. Software Validation Team Leader.**

* Writing procedures to meet IEC62304 and FDA 510(K) for medical device software development.
* Project planning software validation process from specifications to test.
* Writing software specifications for Insulin Delivery system.
* Running a team of 4 in house software validation engineers.
* Working under ISO13485 approved Quality system.
* Advising external software developers, CEO and CTO on the software development process.

**Oct 2008 to June 2009 Contract with \*\*\*\*\*\*\*\*\*\*\*\* Ltd**

* Full design of a generic 32bit Microcontroller PCB for their specific range of medical Products, from start to finish.
* Full software design for their latest product prototype ready for clinical trials that started in June 2009. Included software for safety critical Microcontroller embedded solution above in UML and C (Using Rhapsody and the IDF framework) and two Windows XP embedded UI’s in C# for an off the shelf PC to communicate with the safety critical Microcontroller board. One for use as an engineering test/research UI and a simplified end user application UI suitable for Clinical trials.
* Project Management of the complete embedded solution design, completed at Blackwood Embedded Solutions Premises
* Fully integrating the complete product together onsite.
* Problem solving in other areas of their system design as need.

# July 2001 to June 2008 Gyrus Medical Ltd, Cardiff – Senior Design/Senior Professional Engineer

* Designed a universal CPU card based on 16bit Fujitsu microcontroller (used in five products to date)
* Designed an upgrade version of the above card that was based on a 32bit Fujitsu, designed as a drop in replacement for the above card.
* Contributed to the design of four electro-surgical generators, gaining valuable design experience in analogue signal conditioning circuits and embedded software development.
* Gained experience in FMEA and RA on all stages of the design.
* Researched and introduced UML and associated tools (Rhapsody) in to the software design process.
* Gained 4 years experience in Rhapsody UML tool to generate code in C.
* Experience of integrating legacy code with the UML auto code generated code, to avoid major redesign of software.
* Project Managed inter-company project with ISi Da Vinci Surgical Robot (completed under budget) including software development.
* Written various Data logging and Remote Generator Control applications in C# for windows.

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# Nov 2000 – July 2001 Altera UK Ltd - Design Engineer

* Prototyping of the Excaliber chip (ARM version) with the use of the 600K gate Altera FPGAs devices. This was done using Verilog HDL, synthesized with Leonardo spectrum and Quartus to place and route the design. The ARM software developer kit was also used to write C-code to test the prototype.
* Designed a complete GPIO port that can be connected directly to an ARM AHB bus.
* Designed features to test the Excalibur chip.

**1990 - Nov 2000 Huntleigh Diagnostics, Cardiff**

**June 1999 – Nov 2000 Design Engineer.**

Designed a new medical device based on optics and software based neural network, utilising analogue and digital electronics and embedded software. Prototypes were in the field gathering data when I left the Company.

Part of a team working on a two-year project that produced an advanced concept portable medical device – the Huntleigh Assist, a portable medical computer with exchangeable medical modules for various applications. My input included design of various sub-circuits, the writing of circuit descriptions and test specifications, getting the unit through the relevant medical standards, EMC testing and production of reports.

I was also involved in various lesser projects, notably the re-design of the Huntleigh Baby Dopplex fetal monitors to merge the three variants into one PCB, simultaneously replacing an obsolete PLD and other digital control circuitry into one larger CPLD.

In summary, during this period I designed circuits with 8/16/32 bit embedded micro-controllers, digital circuitry (including Altera/Xilinx FPGA's), analogue circuitry and LCD display circuitry and have wrote software in 'C', 'C++', and Assembler.

# Aug 1998 – June 1999 Junior Engineer

Designed a self-charging and self-monitoring battery pack and communication interface for use within the Huntleigh Assist product.

Whilst in the final year of my Degree I took a signal processing ASIC designed by Huntleigh and designed the necessary embedded circuitry around it which included a 16bit micro-controller, colour quarter VGA LCD and control circuitry. The software for this system was completely written with ‘C’ to produce a pocket sized colour spectrum analysis Doppler.

**Apr 1997 – July 1998 Engineering Technician**

I was originally involved in building and testing engineering prototypes and advising the Senior Engineer on the feasibility of producing various designs. The practical aspects of my production experience were invaluable in aiding design for manufacture.

My role also included the design of sub-circuits and test software for the Hitachi H8 series of 16bit micro-controllers. This included flash programming software using Visual C++. Designed FPGA circuitry using the Xilinx package for the control of LCD Displays.

**Mar 1990 – April 1997 Production Tester/Technician**

I was initially employed as a Production Tester and was subsequently promoted to Technician level, involved in all aspects of this role.

I was also involved in the introduction of new products to the production line from initial pilot build stage, up to final production models, working in close liaison with the Engineering and QA Department to overcome any problems with processes.

**1989 - 1990** **Electronics Technician at Whitbread Wales PLC, Cardiff. (YTS)**

During this period I was involved in the installation and repair electronic and mechanical systems for pub entertainment equipment.

### EDUCATION, QUALIFICATIONS AND TRAINING

* 1. **University of Wales Institute Cardiff**

BSc. Electronics Design, 1st Class Honours

Awarded South Wales Institute of Engineers prize for Best Engineering Student of Year

**1991 - 1993 Cardiff Institute of Higher Education, Cardiff, South Glamorgan**

BTEC HNC Electronic Design Engineering

**1989 - 1991 Coleg Glan Hafren, Cardiff, South Glamorgan**

BTEC ONC Electronic Engineering

**1987 - 1988 Cheltenham Bournside School and Sixth Form Centre, Cheltenham, Glos.**

GCSE Electronics

**1985 - 1987 Prince Rupert School, Rinteln, BFPO 29**

5 O levels and 2 CSE’s

Other: -

* Rhapsody UML for C
* EN 60601 training by UL
* Verilog
* Basic surgical techniques training at WIMAT, UHWC
* In-house anatomy training including practical work at Cardiff University
* Visual sourcesafe
* Microsoft Visual studio 2008/10
* Microsoft Project
* Microsoft office suite
* DOORS