John Roy Honniball BSc. (Hons)

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Profile

A Software Engineer with 26 years' professional experience working with diverse computer architectures, operating systems and programming languages.

Key Skills and Experience

Skilled in design, coding and testing of applications, real-time programs, embedded software and system programs.
Experienced UNIX (Linux, SunOS) network System Administrator and programmer.
Skilled in hardware design and construction to prototype and small batch production level.
Programming experience in C, C++, assembler, Python, occam, BASIC, Pascal, Perl, and shell scripts
Ability to work as part of a team, or on own initiative, to complete complicated design projects.

Employment History

Reach Robotics, Stoke Gifford, Bristol Embedded Engineer 2016-2019

Played critical role in development of MekaMon games robot, from early prototype to final delivery of production version. Robot was based on Microchip PIC32 microcontroller, along with PIC16 and PIC10 microcontrollers in legs and accessories. Firmware written in C using Microchip MPLAB X IDE and Harmony framework. Robot runs four-legged walking kinematics along with Bluetooth Low Energy (BLE) interface to mobile device. Microcontroller firmware updated over-the-air or via USB, using encrypting bootloaders. Hardware debugged and tested using oscilloscope and logic analyser. Patent applied for and granted on the design (GB2560197). Built-in factory test mode added for production run at Contract Manufacturer in China.

Subsequently worked on future product development using Atmel SAMD20 microcontroller, ESP32 BLE module and ATtiny1616 in the robot legs. Development in this project was in Atmel Studio 7 and used Atmel Start framework.

Source code control using Git and BitBucket. Also used Trello, Jira, Doxygen, Slack and Confluence.

Simulation Systems Ltd., Yatton, Somerset Software Engineer 2014-2016
(now Costain, based in Weston-Super-Mare)

Development work on firmware for portable traffic signal controller. Controller was designed in-house and uses UHF radio data links to control vehicle and pedestrian signal heads, typically at roadworks. Real-time control firmware written in C using GNU C Compiler (GCC) for Microchip PIC32 microcontroller using MPLAB X Integrated Development Environment (IDE). Source-code version control using CVS and Git. Worked on interfacing using serial RS-232 links, and new radio protocol development.

Also worked on CCTV pan-and-tilt head controller. Dual PIC18 microcontrollers interfaced via I2C and running PID control loop. Interfaced using dual 12-bit ADC chips, RS-485 and dual H-bridge motor driver. Another project for measuring the width of lorries on the M25 used the PIC16F18345 microcontroller and an array of LIDAR sensors on an RS-485 communication bus.

General engineering duties included writing technical specifications and test plans.

Lobster Pictures, Bristol Software Developer 2009-2014

Design and implementation of control unit for high-quality time-lapse camera. Built prototype using Arduino microcontroller board and mobile phone (GSM) module to monitor and control the digital SLR camera via SMS text messages. Patent applied for and granted on the design (GB2499637). Designed and built printed circuit board (PCB) for production version. Completed PCB was manufactured in small batches, installed in camera housings and deployed worldwide. Real-time control firmware written in C using GCC for Atmel AVR (ATmega328 and ATmega1284) microcontroller and Arduino IDE. Source-code version control using Subversion and occasional script programming in Perl. Working with digital cameras, GSM wireless routers and Linux on small form-factor PCs. General engineering duties included design and construction of solar and wind powered camera rigs; improvements to design, construction and testing of time-lapse camera systems.

Tektronix, Bristol Software Engineer 2006-2007

Member of software development team, writing in C++ for "Cerify" digital TV quality-control system. Working with compressed video formats (MPEG, MOV, 3GPP, H.264) and their associated audio formats. Worked on integration test suite that ran as part of nightly software build system. Design and coding of new quality-control tests and improvements and bug fixing on existing code (Windows and Linux versions). Occasional Linux System Administrator duties and Subversion source-control administration. Use of Test-Driven Development (TDD).

Adelix Ltd., Bristol — Senior Programmer — 2004-2005

Software engineering for WiFi (IEEE 802.11b) router product based on embedded Linux, delivering high bandwidth internet and voice connectivity. Kernel and device driver programming in C for ARM (Intel IXP425) using ucLinux and GCC. Also designed hardware, constructed prototype and wrote firmware for Power Over Ethernet (PoE) controller using ANSI C and assembler on Atmel AVR (ATMega8) microcontroller.

University of Bristol — Research Associate — 2003-2004
Hewlett-Packard Labs, Bristol — Research Student — 2002-2003

Mobile Bristol research project, building mobile and wearable computers. Hardware designs based on Microchip PIC microcontrollers and programmed in assembler. Software work involved Windows CE (Pocket PC 2003/Windows Mobile) programming in Microsoft Embedded C++, alongside web-based code in Perl, PHP and SQL under Linux. Working with HP iPaq handheld computers, wireless networks (802.11b), GPS receivers and digital compass modules.

Eurologic Development (UK) Ltd, Bristol — Senior Software Engineer — 2001
(changed name to Elipsan; now owned by Adaptec)

Module design, code review and debugging work on an iSCSI storage project. Software engineering for a RAID disk array suitable for high-performance Storage Area Networks. Kernel and user-space code written in ANSI C under the Linux operating system.

University of the West of England, Bristol — Visiting Lecturer — 1998-2001

Supervisor for practical work on undergraduate Human-Computer Interaction course. Students worked with Visual Basic and HTML to create prototype user interfaces. Tutored practical sessions, marked assignments and marked exam papers.

Submetrix Ltd, Bath — Senior Software Design Engineer — 1995-1998
(now acquired by S.E.A. Ltd)

Lead role in multiple sonar software design projects, taking part in complete product development life cycle. Partial reverse-engineering of sonar due to end-of-life of the transputer and obsolescence of SunOS. Responsible for all real-time aspects of the sonar data acquisition system.

Carried out major hardware and software improvements to make the system more compact, reliable and cheaper to manufacture. Worked on embedded software running on transputers and Sun UNIX (SunOS) workstation. Completed hardware design and prototype construction, then took part in sea trials and customer demonstrations. Transputer software written in ANSI C; Sun software written in K&R C.

INMOS Ltd, Bristol — Senior Design Engineer — 1989-1994
(now ST Microelectronics Ltd.)

'Inquest' debugger, S720 X server software, S514 B016 device driver. UNIX (SunOS) kernel programming and device driver work, in support of the INMOS transputer development boards. Coding for transputer, Sun-3 and Sun-4, along with occam programming, UNIX shell scripts and some assembly language.

Time Manager International, near Colchester — Senior Programmer — 1989

TMI Key Results Personal Information Manager program for MS-DOS. Software written in Borland Turbo Pascal.

London Software Studio Ltd, London — Senior Programmer — 1986-1989

Sharp 'Projector', Polaroid 'Shoot', Enhanced Personal Presentation System. Implementing PC graphics software for CGA and EGA cards. Coding in BASIC, C and 8086 assembler for MS-DOS.

Patents

Co-inventor of UK Patent number GB2499637, granted 27th May 2014, for time-lapse photography apparatus.

Co-inventor of UK Patent number GB2560197, granted 5th September 2018, for infrared positioning system.

Publications

Honniball, J.R. and Thomas, P.J. (1999) **Medical Image Libraries: The ICoS Project**. In Proceedings of the SPIE Conference "Multimedia Storage and Archiving Systems", SPIE, Boston, Massachusetts.

Honniball, J.R. and Thomas, P.J. (1999) **Medical Image Databases: The ICoS Project**. In Proceedings of the IEE Colloquium "Multimedia Databases and MPEG-7", IEE, Savoy Place, London.

Education and Training

University Of The West Of England, Bristol 2007-2009
Postgraduate Diploma in Robotics, with Distinction

University Of The West Of England, Bristol 1998-2001
Research Student in Faculty of Computer Studies and Mathematics

Westfield College, University of London 1981-1985
BSc. Lower Second Honours degree in Computer Science with Electronics

Colchester Institute 1980-1981
'A' levels in Computer Science (Grade A) and Physics (Grade A)

Colchester Royal Grammar School 1973-1980
Eight 'O' levels. 'A' level in Electronic Systems (Grade A).

Personal Information

Date of Birth: December 1961 Driving: Full, clean, current UK driving licence

Interests

Photography (originally on film; now digital)

Linux (active in Bristol and Bath Linux User Group).

Microcontrollers: NXP ARM (LPC2119), ST ARM (STM32), TI MSP430, Atmel AVR and Arduino

Regular visitor to Bristol Hackspace and Dorkbot Bristol.

Reading, especially on subjects such as architecture, engineering, cryptography and computer science.

Collecting and preserving classic computers. Member of Computer Conservation Society, exhibitor at TechAdventure 2008/9, exhibited Compukit UK101 at Vintage Computer Festival at Bletchley Park in 2010.

Maker Faires: exhibited flat-bed pen plotter at Maker Faire Newcastle (2009, 2010, 2011 and 2013), Bristol Mini Maker Faire (2013, 2015 and 2016), Brighton Mini Maker Faire (2011, 2012) and Derby Mini Maker Faire (2012).

Technical Skills Summary

Operating Systems: MS-DOS, Microsoft Windows, Windows CE, SunOS/Solaris, NetBSD, MacOS, Linux.

Embedded Frameworks: Microchip Harmony, Atmel Start.

Assembler: Atmel AVR, Microchip PIC (8-bit), 6502, 6809, Intel 80x86, Motorola 68000, INMOS transputer.

Languages: C, C++, Python, Perl, BASIC, Pascal, HTML, SQL, LaTeX, PostScript, JavaScript, HPGL.

Hardware: Digital logic design, PCB design using Eagle, Altium and KiCad, serial and parallel interfacing, I2C, SPI, OneWire and RS-232 interfacing, Microchip PIC18 and PIC32, Atmel AVR, Nuvoton N76E003and ARM microcontrollers (NXP, STM32, SAMD20), Arduino microcontroller module, use and repair of test and measurement equipment (multimeters, function generators, EPROM programmers, oscilloscopes). Electronic construction using solder (through-hole and surface-mount) and wire-wrap.

Networking: TCP/IP (basic routers and switches), Ethernet, Wireless LAN 802.11b, Bluetooth Low Energy (BLE).