Curriculum Vitae

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| --- | --- | --- | --- |
| Name: | Jonathan Naylor |  |  |
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|  | BN14 8EH | Date of birth: | 17 December 1964 |
| Tel: | +44 7973 695261 | Languages: | English, German |
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### Employment Experience

I have been an IT Consultant and Employee to multi-national commercial and financial organisations for over twenty years. From this experience I can bring the following to any role:

* The ability to see the essence of the problem and to choose the correct technologies to solve it.
* A belief in keeping a solution as simple as possible, but not too simple. Too many systems are overly complex and are difficult to understand and maintain.
* Designing reliability and safety into systems from the beginning.
* An exposure to many different technologies over the years, and using many different methods to solve them, leading to a well-rounded understanding of IT systems.

# Brief Technical Summary

I have used the following operating systems, programming languages, databases and other products in my career.

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| --- | --- | --- |
| Product | Experience | Last Used |
|  |  |  |
| Operating Systems |  |  |
| UNIX (AIX, HP-UX, Solaris, Linux) | 16 years | 2019 |
| Windows (XP/Vista/7/8/10) | 12 years | 2019 |
|  |  |  |
| Languages |  |  |
| C/C++ | 16 years | 2019 |
| UNIX Shell Scripts | 13 years | 2019 |
| MATLAB | 3 years | 2015 |
| Python | 2 years | 2016 |
| SQL | 10 years | 2019 |
|  |  |  |
| Embedded Processors |  |  |
| ARM Cortex-M3/M4 | 4 years | 2019 |
| TI TMS320F28335 | 1 year | 2019 |
| Atmel ATMega | 1 year | 2016 |
|  |  |  |
| Miscellaneous |  |  |
| Sockets (Windows/UNIX) | 12 years | 2019 |
| GUI Development (X11/Motif/MFC/wxWidgets) | 11 years | 2019 |
| Version Control Software (Git/SVN/ClearCase) | 9 years | 2019 |
| STL (Standard Template Library) | 5 years | 2019 |
| RF Communications Protocols (DMR/P25/NXDN) | 7 years | 2019 |
| Wired Communications Protocols (X.25/LAPB/CANbus) | 10 years | 2017 |
| Digital Signal Processing (DSP) | 6 years | 2019 |
| Hardware Interfacing | 6 years | 2019 |
| High Level Architecture (HLA) | 6 months | 2018 |
| Jenkins | 2 years | 2018 |
| LDRA | 6 months | 2019 |
| TI Code Composer Studio | 1 year | 2019 |
| MISRA C | 1 year | 2019 |

# Career

December 2018 - Present Igence Software Ltd

East Grinstead

Great Britain

Associate

This contract involves upgrading already written embedded C on a Texas Instruments TMS320F28335 processor. This software is being raised to a very high safety level, with support from the LDRA Testbench using both its static (MISRA-C 2012) and dynamic analysis tools. The code is being developed using Code Composer Studio 7 on Windows. The source code is held in a Git repository.

August 2018 – November 2018 Edwards Vacuum Ltd

Eastbourne

Great Britain

Senior Software Engineer

This contract was mainly bug fixing on an ARM Linux environment. The software was written in modern C++ and interfaced to a dual-core A9+M4 ARM processor from NXP. The different elements of the system communicated using DDS. The source code was held in a Subversion repository and bug tracking was done with Axosoft, with TeamCity being used for continuous integration.

January 2018 – August 2018 Textron Systems Electronic Systems UK Ltd

Hamble

Great Britain

Software Engineer

This contract was to create a real-time simulation system to exercise some specialist hardware. This required very high-performance operation, so Linux was chosen as the main platform (the GUI was on Windows) and that was my part of the development. The software was written in pure C++ 14 with STL and interfaced to various hardware devices such as AIM MIL-STD-1553 cards and BrainBoxes DIO boards using the EDAM protocol. A HLA interface was added to provide access to the simulation from external systems. Source code was held in a Git repository with Jenkins for continuous integration, Doxygen was used for documenting the work.

June 2017 – December 2017 Igence Software Ltd

East Grinstead

Great Britain

Associate

This consisted of two projects. The first was using embedded C on a Texas Instruments TMS320F28335 processor, development was using Eclipse and Code Composer Studio on Windows. The code had to meet the MISRA-C 2012 standard. The second was a radar control system implemented on Windows but designed to be potentially cross platform, with the connections and data handling being done in C++ and the GUI being developed in C# and WPF. There was a strict separation of responsibility between the GUI and the back end to allow for non-PC platforms to be developed at a later date.

November 2016 – May 2017 XPI Simulation Ltd

Chessington

Great Britain

IT Consultant

This contract involved work with two disparate systems. The first was vehicle simulation software. My particular role was interfacing into a hardware servo controller from Kollmorgen using C++ using the CANBus protocol. The second was developing a simulation of an Electronic Warfare scenario for a DSTL research project using the High Level Architecture (HLA) on Pitch products using C++. The source code for both was held in Subversion repositories.

April 2015 – November 2016 Roke Manor Research Ltd

Romsey

Great Britain

IT Consultant

This project consisted of development on both C++ and Python. Jenkins was used for continuous integration. The source code was held under Subversion.

June 2015 – Present

Creating a multi-mode RF modem, implementing the DMR, Project 25 Phase 1, and NXDN on-air protocols, amongst others. This modem processes the raw voltages of transmitters and receivers and implements the modulation method (GMSK and C4FSK) as well as the communications protocols which include FDMA and TDMA systems. This also involves techniques such as Forward Error Correction (FEC) as well as signal synchronization. The data payload is either pure data or digitised voice. This development is in use around the world. The software is open source and is hosted on GitHub.

June 2014 – April 2015 Cubic Transportation Systems Ltd

Salfords

Great Britain

Senior Software Engineer

This job consisted of maintaining and developing the software used in both the Transport for London and Train Operating Companies electronic ticketing systems. The former is best known for Oyster cards, while the latter is using a UK wide standard named ITSO. It is an embedded system based on ARM processors running Linux with specialist hardware attached. The development environment consisted of C++ on Windows and Linux, as well as test harnesses written in Python. Source code was held in both Git and Clear Case. Continuous integration was done with Jenkins.

August 2013 – June 2014 HP Enterprise Services Defence & Security UK Ltd

Hook

Great Britain

IT Consultant

I was taken on to work on two defence related projects which requires me to be cleared to SC (Security Clearance) level. The code base for the first project was a combination of C, C++, Ingres database, and wxWidgets on Linux. Extensive use is made of a combination of the Rational Unified Process and Agile development techniques including Test Driven Design. The nature of the project meant that all development work was backed up by a large amount of documentation. The second project was maintaining a large system that used various combinations of C++, C#, ORACLE, and Visual Basic, on Windows and Solaris as appropriate.

October 2009 - June 2013 University of Leicester

Leicester

Great Britain

MSc and PhD student

I started an MSc in Information and Communication Engineering in October 2009, which lasted for one year. In the course I learned MATLAB and SIMULINK for writing communication system simulations, as well as both the theory and the practical side of Digital Signal Processing, using Texas Instruments DSP chips (TMS320C5x and TMS320C6x series). These last two were programmed in assembler and C respectively. In addition I wrote embedded C code on embedded processors as part of the course.

After finishing the MSc, I started a PhD researching HF radio propagation over the North Pole. This involved actively monitoring propagation using transmitters and receivers and simulating the results using a large computer model. Much of my work was refining this model to better match the observed results from the receivers. Later work involved using a military standard data modem and analysing its performance over marginal arctic radio paths. This involved working with the relatively undocumented communications protocol that the modem used.

In my spare time I started an open source project for handling and routing digital audio in real-time. This project is written in C++ and uses wxWidgets to provide platform independence as it runs on both Linux and Windows. The software includes drivers for specialist hardware, some of which is badly behaved. This software is actively maintained and is in use worldwide.

November 2006 - August 2008 SWIFT

La Hulpe

Belgium

Analyst/Programmer

March 2006 to August 2006 ICOS Vision Systems

Heverlee

Belgium

Analyst/Programmer

August 2005 - December 2005 Siemens

Herentals

Belgium

Analyst/programmer

August 2004 - May 2005 La Poste/De Post

Brussels

Belgium

Analyst/Programmer

July 2003 - May 2004 Zycomm Electronics Ltd

Ripley

Great Britain

Architect/System Administrator

October 2000 - August 2001 Alcatel (Schweiz) AG

Zürich

Switzerland

Software Designer/Developer

April 2000 - September 2000 Fimatex S.A. Switzerland

Zürich

Switzerland

June 1998 - April 2000 Société Générale Bank & Trust

October 2001 - February 2002 Zürich

Switzerland

**Education**

1978-1981 Anthony Gell Comprehensive School, Wirksworth

6 ‘O’ Levels

1982-1984 Derby College of Further Education

3 ‘A’ Levels

1985-1987 Derbyshire College of Higher Education

HND Computer Studies with Distinction

1994-1997 Nottingham University

BSc (Hons) Computer Science 2-1

2009-2010 Leicester University

MSc (Distinction) Information and Communications Engineering

# Professional Training Received

2018 Using LDRA

2001 Developing Enterprise Applications with BEA WebLogic Server, BEA course

WLS-102 (J2EE)

**Interests**

My main hobby is amateur radio, which I have been interested in since I was twelve years old, and which I hold the amateur radio callsign of G4KLX. I am always interested in trying challenging areas such as satellites, moon-bounce, very low frequencies and new data transmission techniques for very weak signal work. I develop DSP/SDR and digital voice software in my spare time.

I have been involved in a number of open source projects. My current project is a multi-protocol RF modem for use with among other things, Digital Mobile Radio (DMR), APCO Project 25 (P25) phase I, and NXDN (Icom IDAS and Kenwood NEXEDGE). This involved DSP work along with RF and Internet protocol work. It is in use around the world.