Curriculum Vitae for W.J. Christmas

January 19, 2012

Personal Details

Full name: William Jeffery Christmas

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Date of birth: 25th January 1950

Marital status: married

Nationality: British

Professional qualifications: Member of the Institution of Electrical Engineers, Chartered Engineer

Current position: University Research Fellow in Technology Transfer, Centre for Vision, Speech and Signal Processing, University of Surrey

University of Surrey: 1992 onwards

I am currently employed as a Research Fellow in the Centre for Vision, Speech and Signal Processing in the University of Surrey. I specialise in the development of algorithms for computer vision. My current activities include:

- Investigating transfer of learning, as part of the EPSRC-funded ACASVA project.
- Developing the RAVL C++ library for computer vision and pattern recognition.

Past projects inlcude:

- I-Dash: Investigator's Dashboard
- VAMPIRE: Visual Active Memory Processes and Interactive REtrieval
- ASSAVID: Automatic Segmentation and Semantic Annotation of Sports Videos
- The use of probabilistic reasoning to develop a methodology for solving matching problems in computer vision. This was the subject of my PhD.

My other activities in the Centre include:

- securing EPSRC, EC and industrial research contracts;
- teaching, including tutoring first- and second-year undergraduates, and supervision of M.Sc. laboratory sessions, and lecturing;
- providing support for the users of the Centre's computing facilities - acting as a link between the users and the system management.

BP International Research Centre: 1986 – 1992

1988 – 1992: Research Engineer / Senior Research Engineer, High-speed Computing Section

My role in this team was to provide expertise in the development and integration of hardware and software for real-time image processing. I spent most of my time in the development of a real-time image enhancement system for improving the quality of video signals from underwater cameras. The hardware used was the Datacube real-time image-processing system with the associated Maxware software package; this was controlled by an embedded microprocessor running the OS-9 real-time operating system. The system performed a range of image enhancement functions, at 25 frames/s, including linear and non-linear temporal filtering, motion compensation for the temporal filters, and homomorphic filtering for contrast enhancement. I tested the system twice under operational conditions in the North Sea, on an oil-drilling platform and on a pipe-inspection ship.

Other tasks included:

- the development of parallel processing applications on the Meiko Computing surface, using both Occam and CSTools

- development of Unix-based graphics applications using PV-Wave

During the academic years 1989 – 1991 I also undertook a part-time M.Sc. course in signal processing and machine intelligence at Surrey University, which I passed with distinction.

1986 – 1988: Research Engineer, Computer Developments Project

The aim of this project was to develop a parallel-processing computer with 100 processing elements. My role was that of electronic engineer in a team that mainly comprised computer scientists and mathematicians. My main activities were to produce ideas for novel c.p.u. architectures, together with the design, simulation and prototyping of the resulting hardware. In particular I produced a novel design for a crossbar interconnection scheme for the parallel-processing machine, and built a prototype. I also gained experience in the use of CAE tools, designing with large programmable logic devices, and in the functional and hardware modelling of components of computer systems.

BBC Research & Development Department: 1972 – 1986

While at the BBC, I undertook a range of projects related to telecommunications. These projects required a variety of skills, in the areas of digital and analogue electronics, radio and television signal propagation, digital signal processing and computing. The following are some of the projects for which I was responsible:

- the design of the hardware and software for a real-time multiprocessor-based digital sound coder and decoder for a digital stereo sound service for television (NICAM). This was part of a project whose aim was to provide a complete technical specification for the sound channels. As a result of this work, I gave a half-day seminar on the architecture and use of the TMS32010 digital signal-processing chip at the Polytechnic of Central London, as part of a course on digital signal processing for engineers from industry.

- the design of two microprocessor-based systems for broadcasting low-bit-rate data with existing radio services, including computationally efficient algorithms for digitally shaping the data waveform.

- a software package to provide a statistical analysis of error rates for v.h.f. data broadcasts using various data coding schemes

- a real-time multiprocessor-based system to insert data packets into and extract packets from a 4 Mbit/s data multiplex. This was for use in a satellite television (CMAC) digital sound system.
- a study of encryption methods for satellite television broadcasting
- a system for taking measurements of multipath propagation at v.h.f. This system used digital signal processing techniques to analyse recordings of pseudo-random binary sequences that were transmitted on spare lines of a v.h.f. television signal. The project also included the design of a compact microprocessor-based digital cassette recorder, as suitable machines were not then available.
- software packages for prediction of radiation patterns for u.h.f. antennae, antenna feeder design, and calculation of long-distance propagation of radio waves

Computer skills

My more recent experience has been of extensive programming in C++, in a Unix environment. I also have practical experience in the use of C, Assembler, Fortran, Occam, Pascal and PVwave languages, of the ArcInfo and Ermapper GIS tools, and of the OS-9 and CSTools operating systems. I also spent a few months acting as interim computer system manager for the Centre, responsible for a network running some 10 different flavours of Unix and Microsoft operating systems.

Educational achievements

1995: Ph.D. in Computer Vision, from the Department of Electronic and Electrical Engineering, University of Surrey. My thesis was on the matching of geometric features using probabilistic methods.

1991: M.Sc. with distinction in Signal Processing and Machine Intelligence, University of Surrey

1972: 1st class honours in Engineering Science Finals, Oxford University; Egdell-Sheppey and I.E.E. prizes for performance in finals; Metal Box prize for performance in Moderations

Publications

http://www.ee.surrey.ac.uk/Personal/W.Christmas/list.pdf