Dr. Thomas Parker

Email: tom@tevp.net **Address:** Flat 4, 29 Mornington Grove, Bow, London E3 4AE

Phone Number: 0752 755 9318

Career History:

Imperial College London *Research Associate in Body and Visual Sensor Networks* *4/2008 -*

My primary focus is in embedded systems development for networked, battery powered devices

- Small devices (~3cm^3 - "body sensors") attached to and monitoring people. 2KB of RAM, using TinyOS
  - Working towards various sport-related applications; built virtual "orientation sensor" out of multiple raw sensor values (accelerometers and gyroscopes)
- Large devices (~50cm^3 - "vision sensors") with a full embedded Linux system and camera module
  - Built a generalised software development platform and applications for the devices, allowing transition from earlier limited-purpose work
  - Created userspace middleware for easy development (C API and Python bindings) ; Kernel development (primarily driver debugging and extending); Documentation and tutorials for end users

Delft University of Technology *PhD in Wireless Sensor Networks* *9/2003 - 1/2008*

- Published novel, peer-reviewed work on a variety of areas in Wireless Sensor Networks, including Localisation, Routing, Time Synchronisation and Aggregation techniques
- Major work with MAC protocols and work at all levels of the sensor node radio stack
- Extensive work with implementations of protocols for TinyOS, including building low-level systems for two different hardware platforms (ATMega128- and MSP430-based), and helping to create, maintain and use two separate node hardware testbeds
- Responsible for the mentoring of a student during his MSc thesis work with MAC protocols
- Coursework supervisor for the course "Introduction to High Performance Computing"

My thesis focused on the nature of abstraction in sensor networks - examining how this causes problems through the various layers of the software stack, and showing how rethinking the way in which we approach the problems (using techniques derived from the relationship between linguistics and how it is related to how we think about ideas) can provide better solutions to the difficulties faced throughout sensor networks, with evidence from my implementations of novel protocols both in simulation and for node hardware.

Delft University of Technology *Computer Science MSc* *9/2003-11/2005*

(Note that this was done concurrently with the 1st 2 years of my PhD)
Final project was in the area of Localisation for Wireless Sensor Networks, creating a statistical method for incorporating moving sensors for improved localisation without requiring additional hardware

University of the West of England *Perl/HTML Design/Visual Basic & ASP development* *7/2002 – 9/2002*

- ELTIS (European Local Transport Initiatives System) - a project collecting together a series of case studies and best practices about local transport systems.
  - Re-wrote the search front end; translated the earlier database data; significantly improved the speed at which users could traverse the vast quantities of data in the system
- VirtuAL - a virtual museum system, initially covering Wells Cathedral
  - Rewrote existing website (dynamic database-driven content with ASP); initial work on the CD-based version

Zeal Solutions Ltd *Visual Basic/Visual C++ development for CAD systems* *8/2001 – 9/2001*

- Built a new administration system tracking their products and their users, replacing earlier ad-hoc work with Excel
- Built a conversion utility to convert files from other DDM (Design Data Management) systems to their own system

University Of Bristol *Computer Science BSc* *9/2000 - 6/2003*

- Included modules in Philosophy and Advanced Computer Architectures. Final project focused on easing change-focused reprogramming of the PIC16 series of microprocessors.

MBD Deltacom *Technical work (including Web design, Java applet creation, server maintenance, database interface creation/maintenance, etc.)* *6/1998 (2 weeks) & 9/1999 - 9/2000*

I initially did two weeks work experience for MBD Deltacom, who at the end of that placement offered me work for my year out.

- BBC Broadcast Intranet
  - Wide variety of various web design, Java, and PHP coding work on the Intranet site, including the creation of the Public Service Marketing sub-site
  - Converted PostgreSQL/Apache-based PHP pages to work with new Microsoft SQL Server/IIS system
  - For the last 3 months, was the server manager for the Broadcast Intranet server - approximately 50 users supplying content on a regular basis, and several thousand users across the UK accessing data on it daily
- Network upgrades and support for Twelve Stars Communications (a partner of MBD)
- DABText (Digital Audio Broadcasting Text)
  - Rewriting of the back-end system (PostgreSQL, and Linux TCP/IP code)
  - Rebuilding Visual Basic client software for the new back-end system

Selected Publications:

- Foxtrot: Phase-space Data Representation for Correlation-aware Aggregation - presented at the Fourth Annual IEEE Communications Society Conference on Sensor, Mesh and Ad-Hoc Communications and Networks (SECON 2007)
- Adumbrate: Motion Detection with Unreliable Range Data - presented at the Fourth International Conference on Networked Sensing Systems (INSS 2007)
- Guesswork: Robust Routing in an Uncertain World - presented at the 2nd IEEE International Conference on Mobile Ad-hoc and Sensor Systems (MASS 2005)
- Refined Statistic-based Localisation for Ad-hoc Sensor Networks - presented at the Globecom 2004 Wireless Ad Hoc and Sensor Networks Workshop

Computer Skills:

Expert C (10+ years experience) and Python (5+ years) programmer. Other languages known include C#, Java, Javascript, PHP and Perl. Have worked with the Gtk, wxWidgets and Qt toolkits, and the OMNeT++ simulator framework. Expert level experience with Linux systems, particularly with Debian-derived and embedded systems, and have experience writing kernel modules.

Other activities

I am currently involved with the Gnome project as part of the BugSquad, aiding in bug triage work. As of September 2009, I have been responsible for closing over 11,000 bugs (mainly due to duplicate reports), and have contributed patches to over a dozen separate pieces of software within the project. I've also contributed back accepted patches for a wide variety of other open-source projects from dbus to freetype, network-manager to packagekit, and some of my work is now in the Linux kernel.

During 2004-2005 I was the webmaster for Promood (http://www.promood.tudelft.nl/, a society for PhD candidates at Delft University of Technology). I rebuilt the website, implementing a CMS system that is still in use.

I was the President of BITS (Bristol Information Technology Society) from March 2001 - March 2002, which provided computing services to students at Bristol. I introduced discussion forums for our users, and automated a number of the administrative tasks. I was also responsible for several upgrades of the systems, and dealt with a number of crises that arose, including several attempted security breaches of the server and several incidents where users had breached our Acceptable Use Policy.

Referees

Available on request.