Curriculum Vitae

Balint Seeber

Education

- **Doctor of Philosophy in Computer Science, 2006 - 2010 (in suspension)**
  ViSLAB, School of Information Technologies, Faculty of Engineering
  University of Sydney (USyd)

- **Bachelor of Engineering in Software Engineering, 2002 - 2005**
  School of Computer Science and Engineering, Faculty of Engineering
  University of New South Wales (UNSW)

Publications

- Seeber B., Amin A., Yager N., **'Real-time Detection of Semi-transparent Watermarks in Decompressed Video'**, p. 49, Eighth IEEE Workshop on Applications of Computer Vision (WACV), 2007.

Achievements

- **2006 – Australian Postgraduate Award (APA) in conjunction with a NICTA Research Project Award (NRPA) from the University of Sydney** – I was also offered an APA and NRPA by UNSW. The APA is awarded to the top prospective postgraduate research students while the NRPA is an endorsement by Australia's ICT Research Centre of Excellence.

- **2005 – Class 1 Honours on completion of undergraduate studies** – Earned 11 High Distinctions out of 14 completed third- and fourth-year computer science courses, most notably placing first in Distributed Systems (which is also offered as a post-graduate course) and scoring 95 for my thesis on 'Real-time unbuffered detection of television commercials'.

- **2004 – 'One-off' scholarship awarded by Acoustics Laboratory, UNSW School of Physics** – I designed and implemented a computer-controlled bus architecture, slave modules and software interface for use in acoustics experiments where integrated computer control and monitoring are required.

Employment History

- **2010 - 2011 – Self-employed**, building a technology start-up:
  I have developed some novel software solutions and am in the process of monetising them, in particular the 'Australian Geographical RadioFrequency Map' (**RFMap**), which is enjoying widespread national use.
- **2007 March-May – Tutor**, Computer Graphics course, University of Sydney:
  I tutored undergraduate students, wrote tutorial content (e.g. an introduction to animation and dynamics simulation) and marked assignments, which involved assessing software and reviewing source code. I also presented a two-hour lecture on Image Processing covering acquisition, manipulation functions and filtering.
- **2006 February-August – Software Developer**, iCinema Centre of Interactive Cinema Research, UNSW:
  I was responsible for developing, testing and maintaining a large code base for the 'T_Visionarium II' project. My main achievement was designing and implementing the underlying multi-node distributed video engine capable of simultaneously playing up to 1000 recorded scenes in a 360-degree 3D Virtual Reality environment. The project was featured in the 2008 Sydney Festival, appeared on TV news, and toured internationally.
- **2006 January – Software Developer**, Business Catalyst, North Sydney:
  I connected the backend of an integrated CMS/CRM web solution to several internet payment gateways and continued development of a Microsoft Outlook add-in allowing for seamless interaction with web services.
- **2002 - 2003 – Tutor**, M M Coaching College, Liverpool:
  I tutored five classes, covering HSC-level physics down to junior-level English, mathematics and general ability.
- **2002 February-March – Junior Web Developer**, Doubleday Book & Music Clubs, Lane Cove.

Skills & Experience

Programming Languages

- **C/C++** – Over 11 years experience. I have completed several medium-sized projects (over 30,000 lines) across different platforms using a variety of libraries & tools, e.g.: a Distributed Shared Memory library for Linux.
- **C#/ASP.NET** – Five years experience in creating .NET-based GUI applications and web services.
- **JavaScript** – Experience using jQuery, YUI and the Google Maps API to create my **'RFMap'** web application.
- **Assembly** – Experience in coding with the x86, ARM & MIPS instruction sets (the latter two on an embedded processor development board), and using VHDL to define an emulated pipelined CPU from the ground up.
- **Python** – Experience with several bindings (e.g.: OpenGL, PIL) and Qt GUI development, which were used to visualise various states of a genetic programming assignment, and power my 'iPhone as a GPS' solution.
- **Shell/Make** – Used for compilation and building automated unit testing scripts.
- **Erlang**, **Haskell, Prolog** – Touched on during my degree for four months each. Erlang was used to write a distributed re-configurable router network, while a VRML front-end to a web-based game was written in Haskell.

Major Frameworks/Libraries

- **STL/MFC** – Used in all Linux and Windows application development for over 11 years.
- **OpenGL/DirectX** – Used extensively for over ten years, for example in a game engine **'TEH Engine'**, a real-time multimedia processing and analysis framework **'TehDetector'** and a streaming video toolkit **'NetVideo'**.
- **DCOM/CORBA** – Added COM interfaces to systems so that they can be accessible via a web interface (IIS) as well as standard RPCs, which were used in the administration software of an airline ticket booking system given as a long-term university project.

Major Software Packages

- **Visual Studio** – Extremely proficient after over 11 years of programming and debugging Windows applications, as well as application extensions and web services. Also used as editor for Linux-based projects, alongside gdb.
- **SVN** – Over six years of experience, including administration.
- **SQL Server** – Programming and administration for many projects (e.g. **'RFMap'** and my postgraduate research).
- **Dreamweaver** – Over ten years experience developing both static and dynamic web content.
- **Photoshop** – Used for over 11 years mainly in web content creation and basic retouching.
- **Premiere** – Used for over 11 years in school, university and personal video projects & small films.
- **Flash** – Experience in authoring web content, including writing ActionScript, for a handful of clients.
- **Visual Programming Languages** – Experience from projects (e.g. 'building block' development for Virtools Dev during work on **'T_Visionarium II'**) and postgraduate research (e.g. LabVIEW, PureData, Max/MSP).
- **XCode** – Used to develop the Carbon-based software control interface for the acoustics lab scholarship work.

Operating Systems

- **Linux** – Used Debian for the past 11 years. I have made contributions to open source projects, most significantly implementing International Roaming and Monitor Mode for the Linux kernel driver of the Atmel at76c503a-based USB WiFi adapter. I also set up my own personal five-machine cluster running atop NFS.
- **Windows 2000/2003/2008 Server** – Experience in administration of network and web services, including IIS.
- **Mac OS X** – Experience programming within the native environment as well as some system administration.
- **PalmOS** – Some experience with the HandheldBasic & Eclipse development environments.

Non-technical

- **Group Work & Leadership** – I was elected team leader for each semester over three years in the undergraduate Software Engineering Workshop subject. I was responsible for high-level design, handling of work allocation and component integration, as well as low-level coding and ensuring that my colleagues were on track.
- **Written Documentation** – I have published large amounts of documentation for these systems in the form of detailed software specifications and architecture overviews. Many reports have totalled over 100 pages and were typeset using Latex. I have also written several popular online guides, including how to recover a corrupt RAID 0 disk array, and how Windows' Side-by-Side assembly system works.
- **Communication** – I have given many presentations in which I explained designs and showcased our systems. This culminated in my demonstration of the features of our airline ticket booking system for the Motorola Prize, and later my thesis for the Canon Information Systems Research Australia Project Prize. I have also given multiple demonstrations of my personal work at the monthly 'Dorkbot Sydney' public group meet-up.
- **Languages** – I am fluent in English and Hungarian.

Interests

The passion I have held for creating electronic contraptions from an early age has led me to undertake a multitude of personal projects that vary in scope. I often explore my own ideas, which can result in developing software, building hardware, interfacing electronics to computers or simply satisfying my curiosity. Some of the larger projects I have worked on, or continue to develop, are:

- **RFMap: The Australian Geographical RadioFrequency Map** – A web application that allows anyone to view, search and add to the visualised national RF landscape. Having been online for almost a year, the site has become popular amongst the general public, as well as private corporations and government departments.

- **Aviation Tracking System** – A complete system that enables tracking of secondary-radar-enabled aeroplanes in local airspace. Mode S transponder information, which is gathered by a custom high-bandwidth DSP solution, is processed and visualised by a desktop application. This front-end software in turn powers a streaming Internet feed that enables 3D visualisation in any web browser using Google Earth. It also includes a live virtual 'cockpit view'.

- **GSM Signal Mapping** – A software and hardware package that maps the received signal strength of multiple GSM channels onto OpenStreetMap using GPS. The resulting data can be used to calculate empirical cell site coverage and investigate the feasibility of cell-based geo-location.

- **AudioDataDecoder** – An auto-calibrating software decoder that demodulates a Frequency-Shift-Keyed audio signal into its underlying binary data stream in real-time. Recent additions include statistical analysis of raw data to identify patterns and structure.

- **TEH Engine** – A game engine that uses the latest advances in consumer hardware, features a generalised, extensible architecture (also suitable for real-time animation playback) and a dynamic data binding engine allowing for easy loading, saving & run-time access of data, such as configuration scripts and scenes from 3ds max. Object-Oriented refactoring techniques learnt at university were applied to the initial version to make the design more robust. Recently I used it for a 'tearable' cloth simulation, fluid simulation, visualisation of motion vectors extracted from compressed video, and running the dynamics simulation for a 'physically-controlled LED display'.

- **TehDetector** – An extensible multimedia processing and analysis framework that underpins the research I conducted for my undergraduate thesis. It arose from the need to test multiple interdependent classifiers in real-time using both stored videos and live digital television feeds – requirements that are not fulfilled by any openly available packages.

- **rFFT** – A program that converts pictures into sound by performing, in part, a 'reverse Fast Fourier Transform' on input bitmap data. I pursued this idea with its potential applications to steganography in mind.

- **WebRadio** – A networked system for remotely controlling and listening to my amateur radio receivers over the internet using only a web browser and a streaming audio client.

- **NetVideo/Audio** – A series of applications that enable the broadcasting and reception of video and audio streams over a network, which I have used in my other projects. To ensure robust real-time performance, I employed my own custom communications protocol.

- **Autonomous Earth Driver** – A model racing car I equipped with a GPS receiver and microcontroller that can navigate its own way through each set of entered waypoint coordinates from almost any position on Earth.

I have an amateur radio foundation licence and enjoy setting up temporary rigs 'in the field'.

My main non-technological hobby is mountain biking. I am a ride leader for the Sydney University Bicycle Society and regularly organise large social rides during semester.

Full details of all of my work, including university and personal projects, can be found on my website at:
http://spench.net/