

John Zaitseff

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Character Diligent, hard-working, dedicated, committed to excellence and integrity

Education **University of New South Wales, Sydney, Australia**
1992-1995

- Bachelor of Computer Engineering
- Graduated with First Class Honours
- Thesis: *Design of the Élan Am386SC300 Portable Computer*

Jannali Boys High School, Sydney, Australia
1986-1991

- NSW Higher School Certificate
- Tertiary Entrance Ranking of 96.45

Experience **School of Mechanical and Manufacturing Engineering / Faculty of Engineering, UNSW Australia**
High Performance and Research Computing Officer
May 2012-current

- Designed and implemented two High Performance Computing (HPC) cluster solutions for the School of Mechanical and Manufacturing Engineering: Trentino, consisting of 1024 processor cores and 2TB of main memory, for staff and HDR student use, and Newton, consisting of 160 cores and 320GB of main memory, for thesis student use. Designed the overall system architecture, investigated variant designs, ensured data centre power limitations were met or overcome, negotiated a discount of over 60% off list price with the final vendor (final total price \$154k), installed the hardware, Rocks Linux operating system and high-level software
- Took over maintenance of the Faculty of Engineering cluster, Leonardi; previously, due to lack of resources, Leonardi had not been maintained for almost three years
- Instigated a planned regime of hardware, firmware, software and security updates for all clusters. In particular, clusters undergo a major shutdown once a year that allows hardware to be upgraded and tested, firmware to be updated and verified, and the latest versions of Rocks Linux and system libraries to be installed. This has been a major operational achievement leading to far better system stability
- Successfully performed two major maintenance periods for Leonardi. The first, in particular, was extremely complex due to multiple incompatible firmware versions present on different blade servers and enclosures
- Instituted a policy of proactive installation of security updates based on severity: weekly, daily or immediate, as required. For example, was one of the first at UNSW Australia to implement a fix for the Bash Shellshock vulnerability
- Analysed the Leonardi cluster architecture as originally designed; discovered and implemented technical improvements that gave an up to 35% increase in network throughput for a modest \$8k expenditure. For example, a single rather obscure network setting (jumbo frames) alone yielded a 5% increase in throughput
- Integrated the clusters into the broader University IT framework, such as Active Directory for seamless password authentication: a fairly major accomplishment, given the relative lack of Linux skills in the broader University community. Wrote custom applications and documentation for such integration as needed
- Successfully negotiated with key researchers for significant funding to purchase 480TB of secondary storage for Leonardi; currently upgrading this to 1.2PB
- Implemented a daily, weekly and monthly backup service for all clusters using cost-effective secondary storage: prior to this, no cluster had backups of any sort!
- With appropriate user consultation, determined and prioritised the latest round of significant hardware updates to Leonardi totalling \$169k, including negotiating a 40% discount for an additional 720TB of disk storage

**Experience
(continued)**

- Implemented an automated system using out-of-bands server firmware to alert system administrators of potential or actual hardware issues
- Installed and continue to maintain over 15 major high-level software packages, including Ansys, Matlab, Gaussian and COMSOL, on the HPC clusters
- Set up and maintain a Linux-based FlexLM/RLM licence server for eight major commercial and academic software packages using custom-written scripts: licence daemons can no longer interfere with the operation of other daemons or affect the base operating system installation, unlike the default Linux or Windows setup. Current uptime is better than 99.995% over the last 2½ years
- Set up and maintain Linux-based pre-processing/post-processing workstations for the School of Mechanical and Manufacturing Engineering, directly integrated into the physically-distant Trentino cluster
- Over the course of one year, persistently debugged a major vendor-specific hardware design flaw in certain compute blade servers that was causing those nodes to randomly destroy the motherboard, CPU and memory with no warning. Given a background in electronics design, was able to pinpoint the issue to the power regulation circuitry one year before the vendor finally admitted the same and replaced our servers with redesigned motherboards
- Similarly, consistently and persistently performed troubleshooting of network adapter firmware that caused compute nodes to spontaneously reboot with no useful log messages, implementing vendor updates until stability was achieved, while maintaining normal cluster operation as far as possible
- Currently taking the leading rôle in the HPC Future Committee, consisting of academic and professional representatives from each School, to determine the next generation of HPC facility for the Faculty
- Arranged for in-depth meetings with key vendors to determine capabilities and desired specifications of hardware and software for the new HPC facility
- Arranged for visits to HPC facilities at the National Computational Infrastructure in Canberra and to cluster users at UNSW Canberra
- Responsible for the overall analysis of requirements for the new HPC facility, both at a hardware and software level. For example, currently performing a detailed analysis of job schedulers including Torque/Maui, PBSPro and SLURM, with an eye to custom software modifications as required to suit our needs
- Continue to provide on-going system administration for existing HPC clusters
- Provide a consultancy and help-desk service to over 520 academic, professional and student clients, including performing or helping with complex troubleshooting and programming, in multiple languages such as C, C++, Fortran, Python, Matlab and libraries such as OpenMPI
- Provided detailed system analyses of new or existing hardware to researchers in the School of Mechanical and Manufacturing Engineering, the School of Photovoltaic and Renewable Energy Engineering and the School of Civil and Environmental Engineering
- Developed training materials for the GSOE9400 Graduate School of Engineering subject, including for a three-hour hands-on tutorial. Material has been very well received by students and by new and current academic cluster users
- Quadrupled the utilisation of the Leonardi cluster from approximately 40 users to the current 182 users in a period of two years, particularly by helping raise awareness of this facility across the Faculty
- Currently documenting all HPC clusters in detail, as well as writing additional introductory material for a Faculty of Engineering HPC website
- Instituted and continue to facilitate half-yearly HPC User Group meetings for the last two years, for closer contact with users
- Organise highly popular tours of our clusters on a half-yearly basis
- Contributed code to the Rocks Linux distribution, particularly as a maintainer of the Python and Ganglia rolls. Rocks Linux is used not only by HPC clusters at UNSW Australia, but extensively throughout the world
- Currently implementing a new cluster for the School of Photovoltaic and Renewable Energy Engineering: Tyrean, consisting of 512 cores and 1.4TB main memory

**Experience
(continued)**

**Centre for Autonomous Systems, School of Computer Science and Engineering,
University of New South Wales**

Research Engineer

Sep. 2003–Sep. 2004 (part-time),

Sep. 2004–Nov. 2009

- Intimately involved in the design and implementation of the Birabayin Weeding project: an autonomous robot that removes weeds from between rows of organically-grown crops. Responsible for designing and implementing the low-level driver software using Player/Stage and the mechanical and electrical design of two generations of prototypes. Performed on-farm testing of GPS and laser range-finder guidance systems, as well as of motor control systems
- Intimately involved in the Centre's entry to the world-wide RoboCup Robotics Rescue League competition, particularly in extensively modifying and maintaining the Yujin Robotics RobHaz DT3 robot. Modified and maintained later entries using the VolksBot-based Emu and the RoboticFX Negotiator robots
- Designed and constructed parts of the Disaster Simulation Laboratory for testing Robotics Rescue League competition entries and other robots
- Highly involved in designing and implementing the Humanoid Torso project involving Denso robotic arms, BarrettHand and Robotis 9DOF hands and other sensors. Responsible for designing and implementing suitable safety light-curtain circuitry meeting Australian safety standards
- Maintained, programmed and deployed a wide variety of other robots, including five ActivMedia Pioneer robots with custom sensor payloads and embedded computer systems, an ActivMedia PeopleBot, VolksBot Indoor and RT4 robots, an AirRobot micro unmanned aerial vehicle, Sony AIBO robotic dogs, a Cycloid II humanoid, Denso robotic arms and custom-built Emu, Truxar and DraganFlyer robots
- Maintained, programmed and deployed a large range of robot sensor payloads, including laser range-finders, sonar, GPS, pan-tilt-zoom cameras, Videre three-dimensional cameras, Omega infra-red heat-sensitive cameras and SwissRanger 3D infra-red range cameras
- Designed and implemented a substantial hardware and software upgrade of older ActivMedia Pioneer robots with new VersaLogic-based embedded processor systems, wireless connectivity, power supplies, panels and wiring
- Administered a reasonably large network of computers and robots running Linux, including a number of servers running Web, MediaWiki, Trac, FTP, Subversion, NIS and NFS services, amongst others
- Extensively involved in Debian GNU/Linux and Ubuntu system administration and custom package programming: all robots, computers and servers were reconfigured to use these distributions of Linux
- Responsible for Occupational Health and Safety in various laboratories, member of the University's OHS Committee (and chairman in 2009), responsible for OHS Workplace Inspections, Safe Work Procedures and First Aid
- Wrote and collated in-depth technical documentation for all robots
- Supported researchers from the Centre, as well as fourth-year COMP4411 Experimental Robotics students, with custom designs and modifications, system and network administration and practical advice

Embedded, Real-time and Operating Systems Program, National ICT Australia

Research Engineer (ARM Linux Operating System Programmer)

Sep. 2003–Sep. 2004 (part-time)

- Responsible for the Fast Address Space Switching (FASS) project for ARM processors under Linux, involving in-depth low-level knowledge of ARM processors' Memory Management Units, of the Linux kernel source code (v2.4 and v2.6) and of Linux patch-management techniques using patch, quilt and LXR
- Ported the FASS patch-set to the IXDP425, iPAQ, PLEB and StarGate platforms
- Collaborated with Intel and SnapGear to integrate the FASS patch-set into SnapGear Linux, a popular embedded-platform Linux distribution
- Involved in the design and manufacture of the PLEB II XScale processor platform, as well as a JTAG programming and debugging board

**Experience
(continued)**

- Provided guidance and direction to final-year students in the design and construction of a StrongARM-based Flight Computer board for BLUEsat, the UNSW student micro-satellite project
- Personally manufactured a number of double-sided Printed Circuit Board designs using the in-house LPKF ProtoMat PCB milling machine and through-hole plating system. Familiar with manufacturing four-layer PCBs using the same technology
- Ported and debugged software, created patch files for various projects, was involved in setting programming standards for the entire ERTOS Program, maintained content on Web servers, performed system administration, specified and purchased laboratory equipment

**MedCare Systems Pty Ltd, Australian Technology Park
Systems and Network Administrator**

Nov. 2000–Sep. 2005 (part-time)

- Designed and implemented a small computer network for MedCare Systems (the commercial arm of the Biomedical Systems Laboratory, UNSW), including Debian GNU/Linux-based servers that provided Web, FTP, mail, firewall, printer and DNS services, amongst others
- Ensured the smooth running of the network and servers, by managing security patches, auditing log files and providing a help-desk style service
- Wrote an extensive report investigating hardware and software options for the Home Clinical Workstation, the primary product being developed by MedCare Systems; discussed embedded processor board choices, the advisability of porting or rewriting graphical-based software to Linux, operating system patch management, intellectual property protection and licensing issues
- Was occasionally retained by MedCare Systems as a “consulting expert” on a wide range of hardware, software, network and system administration questions

**School of Electrical Engineering, University of New South Wales
Hardware Design Engineer (Academic Support)**

Sep. 2001–Jun. 2003

- Co-responsible for the complete redesign of the third-year ELEC2041 Microprocessors and Interfacing course at UNSW, particularly in designing, implementing and teaching a series of laboratory experiments involving hardware and software
- Wrote over 250 pages of pedagogical and technical documentation, including a 130-page Laboratory Manual and over 3,000 lines of extremely high-quality, well-documented assembly language source code; student reaction has been extremely positive
- Solely responsible for the content, design and production of the *Companion CD-ROM*, a disc containing everything a student needs at home or in the laboratory (available on-line at <http://www.zap.org.au/elec2041-cdrom/README.html>); almost 14,000 lines of HTML documentation were written for this disc
- Extensively involved in setting up of the refurbished Digital Systems Laboratory, including hardware design and integration, software installation and network/server configuration
- Integrated and customised the GNU Compiler Tools software suite and environment for the Laboratory and CD-ROM, both under Windows and Linux; used CVS to manage the necessary changes to the source code and documentation
- Evaluated a number of ARM processor-based hardware boards for use in a teaching environment, including some in-house designs
- Designed the Expansion Board to complement the ARM processor board finally chosen, requiring circuit design, PCB layout and hardware debugging
- Customised the front-end software for the ARM processor board, involving graphical programming under Linux using GTK
- Performed Linux system administration, designed the typographic look and feel of all documents, modified the eCos embedded operating system and performed programming for programmable logic devices (FPGAs and CPLDs)

Experience (continued) **Biomedical Systems Laboratory, University of New South Wales**
Hardware Design Engineer (Electronics Design, Computer Programming)
Jan. 1996–Sep. 2001

- Designed a generic Universal interface for the PC-based ISA bus, involving schematic circuit design and printed circuit board (PCB) layout; this interface used as the basis of all ISA-bus designs in the Laboratory
- Developed low-level device driver software and intermediate-level interfacing software for the Universal interface for every version of MS-DOS and Windows, including VxD drivers for Windows 95/98/98SE/ME and native drivers for Windows NT 4, Windows 2000 and later
- Designed the PC-PROTO prototyping card, co-designed the PC-SPIRO spirometry card, helped designed the PC-BP blood-pressure card and PC-ECG 12-lead electrocardiogram card, including schematic design, PCB layout, sample software and documentation
- Involved in the design of the Home Clinical Workstation (HCWS), an integrated device providing remote diagnosis and monitoring of patients, including the PCB design for ECG2 (2-lead electrocardiogram) and BP (blood-pressure) components
- Designed other digital and analogue circuits, including a “high-end core” based on the Intel StrongARM SA1110 microcontroller, a serial-port version of the PC-ECG and a PC-Card (PCMCIA) version of the Universal interface

Abilities **Computer Programming**

- Extensive abilities in C, objected-oriented Pascal (Borland Delphi), Perl, Python and all major Unix scripting languages, as well as the ARM, i386/x86, amd64/x86-64, PIC, Z80 and MIPS assembly languages. Competent in C++, Lisp, JavaScript, Tcl/Tk, Fortran and many other high-level and low-level languages and tool-sets
- Highly proficient in high-level user interface, systems-level and kernel-level programming under POSIX, BSD-based and System V-based Unix (especially Linux, the various BSDs and Solaris), Microsoft Windows (including 16-bit, 32-bit and 64-bit API versions) and even MS-DOS. Currently learning graphical applications-level programming under Qt/KDE and GTK
- Highly-developed ability to quickly grasp new programming paradigms, as well as to learn and adapt to any programming language or standard
- Quite familiar with the Linux kernel source code, as well as with kernel programming paradigms, tools and development processes
- Committed to maintaining a high standard of quality in writing source code, including using “best practices” such as Subversion or Git for version control
- Very knowledgeable in typographic design and related disciplines. Extensive abilities in LaTeX/TeX/PostScript/PDF and HTML/SGML/XML. Maintained the official UNSW Thesis style class for LaTeX.
- Written and released applications, including *Star Traders*, a simple text-based game of interstellar trading that has been translated into ten (human) languages, the *Church Lyrics Database* and *Base Calculator*, a popular integer calculator that won the prestigious Ziff-Davis Press 5-star award
- Able to design and implement Web sites using standards-compliant technologies
- Designed and released *Sinorcaish*, a highly-popular simple CSS style sheet that is still used on many web sites around the world
- Contribute source code and bug fixes to Debian GNU/Linux, Ubuntu, OpenSUSE, Mageia Linux, the GNU project, KDE, LilyPond and many other Open Source/Free Software projects
- Practical knowledge of world-wide copyright, licensing and intellectual property laws and issues, as well as of security and cryptography

Systems and Network Administration

- Extensive experience and knowledge of system and network administration under various Linux distributions, including Debian GNU/Linux, Ubuntu, OpenSUSE, CentOS, Fedora and Mageia, as well as BSD-based and System V-based flavours of Unix, including OpenBSD and FreeBSD. Experience with Microsoft Windows systems and networks, including administering heterogeneous environments

**Abilities
(continued)**

- Extensive experience and knowledge of distributed system administration using the Rocks Linux distribution, along with the Torque/Maui job scheduler; currently learning the SLURM job scheduler
- Involved with the Linux operating system since June 1993, including contributing source code and bug fixes to the Debian GNU/Linux and Ubuntu projects, and maintaining Debian and Ubuntu packages in a custom APT repository
- Excellent grasp of open standards and technologies, including TCP/IP, firewalls, HTTP (Web serving), FTP, Secure Shell, Git, SVN, CVS, DNS (Domain Name System), SMTP, POP3 and IMAP (incoming and outgoing e-mail protocols), NTP (Network Time Protocol), NFS (file sharing), NIS/YP and Kerberos (authentication), SMB (Samba/Microsoft networking) and SKS (PGP key-serving)
- Ability to learn new technologies and standards quickly on an as-needed basis, with a commitment to expanding knowledge and experience in all areas
- Currently administering a Debian GNU/Linux-based server since 1998 for the ZAP Group, a non-profit organisation dedicated to providing high-quality software and computer-related documentation

Electronics Engineering

- Extensive digital and analogue electronics knowledge and experience, especially in the area of PC-based interfacing and microcontroller/embedded microprocessor systems
- Highly proficient in using the Altium/Protel EDA tools for schematic capture and PCB layout, including designing schematic components and PCB footprints
- Excellent grasp of surface-mount and through-hole technologies in PCB design and layout, including high-speed and multi-layer boards
- Consistently high-quality schematic drawings and PCB layout designs, with a commitment to maintaining these standards
- Intimate knowledge of many PC-based electrical/electronic standards, including the Universal Serial Bus (USB), PC/104 and PC/104+ buses, amongst others
- Able to grasp new areas of electronics as needed, as well as being committed to continually expanding and improving electronics knowledge and experience
- Reasonable knowledge of programmable logic devices (FPGAs and CPLDs), including designing hardware using schematic diagrams, VHDL and Verilog

Other Abilities

- Excellent command of written and spoken English and Russian, including technical and non-technical communication
- Highly experienced in working with others in a team environment, as well as in leadership
- Many others not listed!

**Interests and
Activities**

- Youth Leader at the Slavic Pentecostal Church, Lidcombe, 1994–2008; currently serving as Youth Leaders' Oversight. Also involved in the weekly ministry of this church, as well as being an itinerant preacher to other churches
- Involved in humanitarian ministry and outreach in Russia through Kids Outreach International, particularly as a volunteer counsellor in children's camps in 2000, 2001, 2005, 2009, 2010 and 2012
- Highly involved in leadership with Students for Christ Australia from July 1994 to December 1998, including a voluntary position of two days per week for the last three of those years
- Reading both non-fiction and fiction rather avidly
- Motorcycle riding (both on-road and off-road)
- Computer programming and electronics
- Bushwalking and camping
- Photography

Résumé current as at November 2014

*Please do not hesitate to contact John Zaitseff for additional information;
Professional and character references are available on request*