# Curriculum Vitae

## Personal Details

**Name**: Andrew James Tridgell
**Date of Birth**: 28th of February 1967
**Marital Status**: Married
**Place of Birth**: Sydney, Australia
**Citizenship**: Australian
**Address**: 26 Carstensz St, Griffith A.C.T 2603 Australia
**Contact Number**: +61 2 6260 6012
**E-Mail**: tridge@samba.org
**Homepage**: http://samba.org/tridge/

## Academic Qualifications

- In 1988 completed a Science degree with majors in Applied Mathematics and Physics at Sydney University.
- In 1990 completed an Honours degree with first class honours in Theoretical Physics at the Australian National University in Canberra. The university medal was received for this work.
- In February 1999 I completed a PhD at the Computer Sciences Laboratory of the Australian National University. My thesis title was "Efficient Algorithms for Sorting and Synchronization".

## Software Projects

I have written a number of pieces of software over the years. Most of these have been open source, licensed under the GNU Public License while others have been research projects.

**Samba** I am perhaps best known as the author of Samba, a SMB file and print server for unix systems. Samba started as a small project to meet a need for file serving on my desktop system but has grown into a large project with a loosely knit but very active development team distributed over the Internet. See http://www.samba.org/

**rsync** During the course of my PhD I developed an algorithm called rsync that provides fast delta-transmission of large file hierarchies over high-latency

low-bandwidth network links. rsync has since become quite popular, particular for the mirroring of large Internet sites. A detailed study of rsync made up about half of my PhD thesis. See http://rsync.samba.org/

**HiDIOS** I developed the HiDIOS parallel filesystem as part of my work on the PIOUS project at ANU during the course of my PhD. HiDIOS is a distributed memory parallel filesystem designed for very high efficiency on large, closely coupled systems with a distributed disk subsystem. HiDIOS has been actively used on a 128 node production AP1000 system running CellOS for a number of years.

**BUG** I developed an automatic speech recognition system called BUG during the course of my PhD. The system is based on a multi-layer Hidden Markov Model that can be driven by a number of micro-recognition units including a recurrent neural network and a more traditional vector quantisation system. BUG is primarily focused on the task of phonetic transcription, using the TIMIT data set.

**KnightCap** I've always had a strong interest in chess so it was inevitable that I would try to write a chess program some day! KnightCap started life as a OpenGL based display system for existing chess programs but soon grew to include it's own quite strong chess program. The name comes from the fact that KnightCap was developed to run on the Fujitsu CAP series of distributed memory parallel computers. These days it is most commonly run on unix workstations and has led to some research on learning algorithms for chess (which I am involved in). KnightCap is the 2001 Australian Computer Chess Champion. See http://samba.org/KnightCap/

**JitterBug** I developed JitterBug to solve the problem of dealing with large numbers of bug reports an help requests in the Samba project. JitterBug is a simple web based bug tracking system that is now used by a large number of free software (and some commercial) projects worldwide. JitterBug development has been stagnant for about 2 years. See http://jitterbug.samba.org/

**Linux/AP+** The port of Linux to the AP1000+ distributed memory multicomputer was completed as part of my work for the CAP project at ANU during my PhD. Since then Linux/AP+ has been used as a research vehicle in parallel operating systems at ANU.

**rproxy** Initially an idea from my PhD researchm, rproxy has developed into a interesting method of accelerating http serving for low bandwidth links. See http://rproxy.samba.org/

**VAIO drivers** I developed Linux drivers for the Sony VAIO Picturebook in-built video camera and hardware video compression. See http://samba.org/picturebook/

**TiVo enhancements** I have developed software and hardware enhancements to the TiVo personal video recorder, an embedded Linux PowerPC system. The enhancements include conversion to the PAL video standard, adding Australian guide data support, adding an ISA bus and adding an ethernet adapter. See http://samba.org/tridge/tivo-ethernet/

**dbench** In response to a set of poor benchmark results for Linux I developed a series of benchmark tools and test suites for Samba and Linux. These have been extensively used for tuning the Linux kernel and have aided in the recent large performance improvements.

**winbind** The problem of single sign-on and centralised password management has been a major problem for Unix systems for a long time. The winbind system that I co-authored provides a very attractive solution to that problem.

**kernel modifications** Separate from my port of Linux to the Fujitsu AP+ I have been involved in a number of important enhancements to the Linux kernel. The most recent of these involved working on the addition of kernel level directory notification and file leases.

**EVACS** I prototyped the electronic election system for the 2001 ACT elections. The code is available at http://evacs.samba.org/

**parsort** Parsort is a highly efficient general purpose parallel sorting system for distributed memory parallel computers.

**misc projects** Other smaller projects that I have started or been heavily involved in include pidl, pserver, 3dttt, build_farm, wbench, ubench, fakecd, depmaker and socklib.

I have also been involved in a more minor way in a number of other software projects, mostly involving the free software and Linux communities.

## Prizes and Scholarships

- Sydney University Experimental Physics Prize 1986, 1987, 1988
- Kinhill Engineering prize for Applied Mathematics 1987
- University Medal in Theoretical Physics at ANU 1991
- Commonwealth postgraduate research scholarship starting 1991
- ANU-Tech postgraduate scholarship starting in 1991
- ATERB postgraduate scholarship starting in 1992
- Samba 2.0 - upgrade of 1999 from Australian Personal Computer magazine
- "Best open source software of the millenium" Geekcast award at LinuxWorld 2000
- Linus Torvalds IDG free software award for Samba Team at LinuxWorld 2001

## Employment Record

• 1987 to 1988 I worked for Efam Resources to develop computer models of financial markets. This led to the development of a software product *The Options Analyst* which I marketed successfully for 5 years.

• 1988 to 1989 I was a programmer with Sonartech Pty Ltd. During this time I was involved in the research and development of a passive sonar system for Australian submarines.

• 1989 to 1990 (after moving to Canberra) I was a programmer at the Research School of Biological Sciences in the Australian National University. I worked on computer models of several physical and biological processes, including bush fire spread, gene sequencing and population dynamics.

• 1991 to 1993 During the course of my PhD I have worked as a UNIX system administrator at ANU, and have undertaken various computing consultancy tasks. These include work on speech systems and developing a system which controls satellite receivers in Australia and Antarctica.

• In 1994 I began as the project leader in the Pious project, a parallel supercomputer research project under the umbrella of the Advanced Computing Systems Cooperative Research Center.

• In 1994 I worked as an Associate Lecturer in the department of computer science at ANU, and was involved in the teaching of 3 first year courses.

• In 1997 and 1998 I did some casual lecturing with the department of computer science at ANU

• In 1999 I started to work half-time for the CAP project at ANU on operating system software for the AP-series of parallel computers

• In 1999 I worked as a half-time lecturer in the department of computer science at ANU, teaching a 3rd year operating systems course

• In mid-1999 I joined Linuxcare as the first Australian employee. I helped establish a research and development group of 14 people in Canberra and was made a Linuxcare research fellow in 2000.

• In March 2001 I joined VA Linux Systems in Australia as a senior engineer in their Network Attached Storage division.

## Research Interests

I have always been an active researcher of new techniques and algorithms. Particular areas of interest include:

- Automatic speech recognition
- Network Filesystems
- Parallel Filesystems
- High performance and parallel computing
- Computer and network security
- Performance tuning and benchmarking
- Networking protocols

### Community Involvement

I have been heavily involved in the Linux and free software movement since 1993. I was the co-founder of the Canberra Linux User Group and have been running the group for the last few years. I have helped to organise numerous Linux events and have been an invited or keynote speaker at a large number of Linux conferences.

## Publications

[Baxter et al., 1998] Baxter, J., Tridgell, A., and L.Weaver (1998). TDLeaf(lambda): Combining temporal difference learning with game-tree search. In *Proc. Ninth Australian Conference on Neural Networks*, pages 168 – 172.

[Baxter et al., 1997] Baxter, J., Tridgell, A., and Weaver, L. (1997). KnightCap: A chess program that learns by combining TD(lambda) with minimax search. Technical report, Systems Engineering, ANU.

[Brent and Tridgell, 1993] Brent, R. and Tridgell, A. (1993). A fast, storage-efficient parallel sorting algorithm. In *International Conf. on Application Specific Array Processors*.

[Green et al., 1990] Green, D., Gill, A., and Tridgell, A. (1990). Interactive simulation of bushfires in heterogeneous fuels. In *Journal of Mathematical and Computer Modelling*, volume 13.

[Potter and Tridgell, 2000] Potter, T. and Tridgell, A. (2000). Unified logons between windows nt and unix using winbind. Technical report, Linuxcare.

[Sitsky et al., 1996] Sitsky, D., Mackerras, P., Tridgell, A., and Walsh, D. (1996). Implementing MPI under AP/Linux. In *Second MPI developers conference*, pages 32 – 39.

[Tridgell, 1990] Tridgell, A. (1990). A numerical model of an interferometric gravitational wave detector. Honours Thesis.

[Tridgell, 1991] Tridgell, A. (1991). A numerical model of an interferometric gravitational wave detector. In *Gravitational Astronomy: Instrument Design and Astrophysical Prospects*. World Scientific.

[Tridgell, 1992] Tridgell, A. (1992). Speech recognition. In *ANU-Fujitsu CAP workshop*.

[Tridgell, 1994a] Tridgell, A. (1994a). Linux in antarctica. *Linux Journal*.

[Tridgell, 1994b] Tridgell, A. (1994b). SAMBA: unix talking with PC's. *Linux Journal*.

[Tridgell, 1996] Tridgell, A. (1996). The PIOUS project. http://acsys.anu.edu.au/research/completed/pious.html.

[Tridgell, 2001] Tridgell, A. (2001). The big switch: Converting a smb server to unicode. In *CIFS'2001 conference*.

[Tridgell and Brent, 1992] Tridgell, A. and Brent, R. (1992). Parallel sorting. In *ANU-Fujitsu CAP workshop*.

[Tridgell and Brent, 1993] Tridgell, A. and Brent, R. P. (1993). An implementation of a general-purpose parallel sorting algorithm. Technical Report TR-CS-93-01, Computer Sciences Lab, Australian National University.

[Tridgell and Brent, 1995] Tridgell, A. and Brent, R. P. (1995). A general-purpose parallel sorting algorithm. *Int. J. High Speed Computing*, 7:285 – 301.

[Tridgell et al., 1997] Tridgell, A., Brent, R. P., and McKay, B. (1997). Parallel integer sorting. Technical Report TR-CS-97-10, Department of Computer Science, Australian National University.

[Tridgell and Mackerras, 1996] Tridgell, A. and Mackerras, P. (1996). The rsync algorithm. Technical Report TR-CS-96-05, Dept. Computer Science, ANU.

[Tridgell et al., 1996a] Tridgell, A., Mackerras, P., Sitsky, D., and Walsh, D. (1996a). AP/linux. In *Parallel computing workshop*.

[Tridgell et al., 1996b] Tridgell, A., Mackerras, P., Sitsky, D., and Walsh, D. (1996b). AP/linux - a modern OS for the AP1000+. In *Proc. Sixth Parallel Computing Workshop*.

[Tridgell et al., 1996c] Tridgell, A., Mackerras, P., Sitsky, D., and Walsh, D. (1996c). AP/Linux - initial implementation. Technical Report TR-CS-96-07, Dept. Computer Science, ANU.

[Tridgell et al., 1992] Tridgell, A., Millar, B., and Ahn-Do, K. (1992). Alternative pre-processing techniques for discrete hidden Markov model phoneme recognition. In *ICSLP'92*, pages 631 – 634.

[Tridgell and Millar, 1991] Tridgell, A. and Millar, J. (1991). Variations on hidden markov models for continuous speech recognition. In *8th Australian Language and Speech Conference*.

[Tridgell and Millar, 1992] Tridgell, A. and Millar, J. (1992). A speaker-independent phoneme recognition system. In *Proc. Fourth Aust. Int. Conf. on Speech Science and Technology*, pages 778 – 783.

[Tridgell and Walsh, 1996] Tridgell, A. and Walsh, D. (1996). The HiDIOS filesystem. In *PCW'95*, pages 53 – 63.

[Tridgell and Walsh, 1997] Tridgell, A. and Walsh, D. (1997). The HiDIOS2 parallel file system on the AP1000+. In *Proc. Seventh Fujitsu Parallel Computing Workshop*.

[Zhou et al., 1993] Zhou, B. B., Brent, R. P., and Tridgell, A. (1993). Efficient implementation of sorting algorithms on asynchronous distributed-memory machines. Technical Report TR-CS-93-06, Computer Sciences Lab, Australian National University.