

Curriculum Vitæ

Warren Keith TOOMEY

Biographical

Date of Summary: 13th May 2026

Name: Warren Keith TOOMEY

Qualifications: Ph.D in Computer Science, UNSW, 1997
B.Sc (Hons), UNE, 1988
Cert IV Training & Assessment, CIT, 2013

Academic Career (Brief)

Jan 2014 – Aug 2021 Teacher (Networking, Cyber), TAFE Queensland
Oct 2013 – Dec 2013 Teacher (Networking), North Coast TAFE NSW
Jan 2013 – Apr 2013 Casual Teacher, Canberra Institute of Technology (CIT)
Jun 2001 – Dec 2012 Assistant Professor & Associate Dean Teaching, Bond University
Jan 1999 – Jun 2001 Lecturer, UC UNSW, ADF
Mar 1995 – Dec 1998 Associate Lecturer, UC UNSW, ADFA
Apr 1992 – Mar 1995 Teaching Fellow, UC UNSW, ADFA
Sep 1989 – Apr 1992 Research Officer, UC UNSW, ADFA
Feb 1988 – Sep 1989 Help Desk Officer and Systems Administrator, UNE

Academic Career

Jan 2014 – Aug 2021

Teacher (Networking, Cyber), TAFE Queensland

My duties included preparing, delivering and assessing units for the Diploma of IT Networking, the Advanced Diploma of Network Security and the Certificate IV in Cyber Security.

Oct 2013 – Dec 2013

Teacher (Networking), North Coast TAFE NSW

My duties included preparing, delivering and assessing units for the Certificate II and Certificate IV in Networking.

Jan 2013 – Jun 2013

Casual Teacher, Canberra Institute of Technology (CIT)

My duties included preparing, co-ordinating, delivering and assessing an on-line course in Advanced Software Development for the Canberra Institute of Technology.

Jun 2001 – Dec 2012

Assistant Professor, School of IT, Faculty of Business, Bond University

My duties included preparing, co-ordinating and lecturing undergraduate and postgraduate subjects in the areas of Programming, Systems Architecture, Networks, IT Security, Games Programming and Internet Technologies. I won several school, faculty and federal awards for my teaching excellence, and I mentored several new academic staff. I supervised Ph.D and Masters candidates and performed administrative duties as required.

In 2006-2007 I was Associate Dean Teaching & Learning, Faculty of Business. I was responsible for the implementation of faculty-wide T&L strategies and procedures, staff training and professional development. I also served on many faculty- and university-level committees and working groups.

Mar 1995 – Jun 2001

Lecturer, School of Computer Science, University College, ADFA, Canberra

My duties included preparing, co-ordinating and lecturing 1st Year Information Systems, 2nd Year Data Communications, 3rd Year Software Engineering and Systems Administration, Masters-level Operating Systems and Data Networks courses; tutoring in various other courses, and administrative duties as required.

As a member of the Computer Science Curriculum Review Committee, I assisted in the complete review and redesign of the ADFA Computer Science Curriculum, with major input in the areas of Operating Systems, Data Networks, Compilers, Computer Architecture, Theoretical Computer Science and Comparative Programming Languages.

Apr 1992 – Mar 1995

Teaching Fellow, Department of Computer Science, University College, ADFA, Canberra

My Ph.D focused on the improvement of wide area computer network efficiency at all levels, and specifically at minimising wide area network congestion.

My teaching duties included lecturing 2nd Year Operating Systems and 3rd Year Data Networks units; tutoring 1st Year Computer Science for Engineers, 2nd Year Computer Architecture, 2nd Year Data Structures, 3rd Year Data Networks and Masters-level Data Networks units; and administrative duties as required.

Sep 1989 – Apr 1992

Research Officer, Department of Computer Science, University College, ADFA, Canberra

My duties were to conduct research into the design and implementation of RHODOS, a generalised distributed operating system. I designed and built several RHODOS subsystems, namely the Memory Management server, the TCP/IP network stack, and a new communication protocol RRDP. Implementation was done in C and C++.

1984 – 1989

Undergraduate student, University of New England, Armidale

I obtained my Bachelor of Science (Hons), IIa with a major in Computer Science and a minor in Pure Mathematics. In 1988-1989 I was employed on the university's Computer Centre help desk and as a system administrator for the Department of Computer Science.

Systems Development and Administration

Systems Development and Programming Experience

I am a practicing systems developer as well as an academic. My largest developed system was one that provided Electronic Program Guide (EPG) data to Personal Video Recorders (PVRs) in Australia. This included a front-end website, www.oztivo.net, and a PostgreSQL back-end database (20+ tables, 100,000+ records in some tables) using Model View Controller (MVC) principles. The database was designed using standard database design principles. The system had up to 20,000 users on a daily basis.

As both a lecturer in IT and a practicing developer of large systems, I am intimately familiar with the software development lifecycle. I use IDEs to develop, refactor and debug software components, profilers to find and remove bottlenecks and dead code, unit testing to find defects, and version control systems to manage software changes and identify regression issues. My focus has always been on high quality, well-tested code with extensive internal and external documentation.

As a person who has primarily worked on Linux and Unix platforms, I have extensive knowledge of the C language, including a strong understanding of the standard Unix/Linux system calls. I am also well versed in Python, Java and Perl, and have taught all languages at university level. In the course of my teaching career, I have also become familiar with other languages such as SQL, Ada, Lisp and Scheme.

Cisco Certified Academic Instructor

I was a Cisco Certified Academy Instructor (CCAI) and I managed the Cisco Academy at TAFE Queensland Gold Coast from Jan 2014 to Aug 2021. I scored 1000/1000 on my Cisco Certified Network Associate (CCNA) exam in 2014. Many of my Cisco graduates have gone on to take up high-level network administration and design positions worldwide.

Systems Administration Experience

Since 1994 I have been the systems administrator for the Linux servers *www.oztivo.net* and *www.tuhs.org*. These systems provide complex web and e-mail service for a large community of Internet users. In this capacity I have gained the skills required to configure web, e-mail and database services, design and deploy large databases, modify source code, port, compile, install and maintain 3rd party software, perform system security analysis and strengthening, and deal with users on a continuing basis. I have also presented a number of papers on system security analysis and strengthening at conferences in Australia.

As a researcher at UNSW and Bond University, I have deployed and managed several servers that were used for teaching and research purposes, including a 40-node computing cluster used for genetic algorithm research. This has involved host-level and router-level firewall configuration to ensure network security. I now use virtual machine (VM) technologies to configure and deploy VM instances for teaching purposes.

Expert Witness Experience

In 2001 I acted as a expert witness in the area of network capacity and throughput in a New Zealand High Court case between PRONET Ltd. and Clear Communications Ltd. My evidence demonstrated a link between the congested network link that Clear was providing PRONET and the high network latency and packet loss that PRONET was experiencing.

Teaching

Primary Objectives in Teaching

My objectives in teaching were to provide students with an understanding of the topic being taught, and the implications of the course material within the scope of the field and within society as a whole. I encouraged students to use their initiative to find out more about the parts of the course that interests them, and I encouraged students to interact with each other and myself, to increase the understanding of the topic being taught.

TAFE Teaching Responsibilities

I was most recently employed by TAFE Queensland to deliver units for the Diploma of IT Network, the Advanced Diploma of Network Security and the Certificate IV in Cyber Security. The main topic areas were network infrastructure, cyber and system security, cryptography and software development. I had 21 contact hours with students each week. I wrote all the course material, and I was the primary developer of the learner's guide and assessment for these units, all of which were used state-wide in Queensland.

Previous Teaching Responsibilities

The majority of the university courses that I have taught (1992-2012) involved 2 hours lectures, 1 hour tutorial and 2 hours laboratories/week for student contact. I was the lecturer, tutor, lab attendant for all courses, and I wrote all the course material, set and marked the assignments and examinations. At Bond University (2001-2012), the subjects were taught to undergraduates & postgraduates combined.

Software Development 3, 2013.
Network Security, 2009-2012.
Systems Architecture, 2010-2012.
Modular Programming, 2009-2011.
Introduction to Programming, 1993-1996, 2002-2012.
Networks and Applications, 1999, 2001-2012.
Introduction to Games Programming, 2007-2008.
Network Technologies, 2002-2006.
Advanced Software Development, 2003-2005.
Operating Systems, 1992-2005, 2012.
Network Programming, 2001-2004.
Introduction to Internet Technology, 2002.
Systems Administration, 1997-2001.
Introduction to Information Systems, 1995–1999.
Advanced Software Engineering, 1997.
Masters Data Networks, 1992–2000.
Data Structures and Algorithms, 1992 (tutor), 1995.
Business Computing AFM 171-1, 1989 (tutor).
Computer Science CS 110-1, 1988–1989 (tutor).

Student Supervision

Henry Larkin, *Predicting Connectivity in Wireless Ad Hoc Networks*, Ph.D Thesis co-supervisor, 2006.
Christian Rueb, *Porting FMI/OS to run on the Xen Virtual Machine Monitor*, Diploma Thesis supervisor, 2005.
Gabriel Shilazi, *Implementing SMP on the Intel Platform for VSTA*, Masters Thesis supervisor, 2004.
Alexander Gustaffson, *User Migration for UNIX Systems*, Masters Thesis supervisor, 2003.
Sydney Grenzebach, *Distributed Honeynets*, Masters Thesis supervisor, 2003.
Ian Bennets, *POSIX Support for Mobile Native Processes*, Masters Thesis supervisor, 2000.
Chris Keogh, *Deploying IPv6 in the Defence Wide-Area Communications Network*, Honours Thesis supervisor, 2000.
Peter Reynolds, *The Design and Development of the Rhodos Communications Subsystem*, Honours Thesis supervisor, 2000.
Jeff Howard, *KuangPlus: A General Computer Vulnerability Checker*, Masters Thesis supervisor, 1999.
Supervision of 3rd year projects: students in 1996–2010.

Special Awards for Teaching

Australian Federal Citation for Outstanding Contribution to Student Learning: 2007.

Vice-Chancellor's Award for Teaching Excellence: 2005.

School/Faculty-level Teaching Awards: over a dozen awards from 2003 to 2012.

Student Council Award for Academic Excellence: January 2005.

Teaching Innovations

2010:

Development of the 'Arjen' technology to add meaning to the cryptic error messages that are returned by compilers, to assist programming students in the understanding of their mistakes: received a teaching & learning grant in 2010 for this work.

2005:

Modification of the 'james' web portal at Bond University to allow students to address "anonymous questions" to a course lecturer: awarded a university-level teaching award in 2005 for this work.

2002:

Co-developer of the 'james' web portal at Bond University, a system with similar features to the now-popular Blackboard and WebCT systems.

1994:

Early use of the World-Wide Web as a means of distributing lecture notes, assignments and other course information in a hyperlinked multimedia format.

Research

Statement of Research Interest and Activities

Software Archaeology , Detection of Code Clones in Software, Improving Learning Outcomes in Introductory Programming Students, Network Security.

I have a strong and on-going interest in the new area of software archaeology. The field of computing is now old enough that historical and archaeological techniques can be applied both to the historical narrative of computing and to the hardware and software artifacts of computing. I have had several papers and book chapters published in this area.

My previous research area was the fast and efficient detection of code clones (sections of common source code) across multiple source code trees. There are many uses for this technology including the detection of plagiarism, code refactoring and identification of copyright violations.

Another previous research area was the identification of common mistakes that novice programmers make, and techniques to improve feedback on these mistakes to improve their learning outcomes.

In 1998 I obtained my Ph.D. For my thesis, I was involved in the study and improvement of computer network efficiency in both local-area and wide-area networks. I designed a new network-level congestion mechanism that allow the information on the location and size of a congestion point in a network to be sent to all packet sources that are causing the congestion. Given this information, the sources can react to minimise the congestion.

Grants and Awards Received

2010

W. Toomey, Bond University Teaching and Learning Research Grant, *Development and Assessment of Software to Detect and Feedback Common Mistakes for Introductory Programming Students*, \$2,200.

2007

W. Toomey, ALTC Citation Award, *Supporting and Encouraging Student Learning through Enthusiasm, Imaginative Resources and Timely Feedback Sustained over a Period of Several Years*, \$15,000.

1992/1993

L.P. Brown, G. Gerrity, W.K. Toomey, Australian Telecommunications & Electronics Research Board, *Evaluation of some Security and Reliability Protocols over Packet Radio*, \$4,000.

Refereed Publications and Conference Papers

W.Toomey, *Unix: Building a Development Environment from Scratch*, chapter 7 of “Reflections on Programming Systems” (pp. 215-231), Springer, 2018.

W. Toomey, *Ctcompare: Code Clone Detection Using Hashed Token Sequences*, Proceedings of the 6th International Workshop on Software Clones, June 2012.

W. Toomey, *The Strange Birth and Long Life of Unix*, IEEE Spectrum magazine, December 2011.

W. Toomey, *1st Edition UNIX: Its Creation and Restoration*, IEEE Annals of the History of Computing, 32(3), 74-82. July 2010.

W. Toomey, *The Restoration of Early UNIX Artifacts*, Proceedings of the 2009 USENIX Annual Technical Conference, June 2009.

W. Toomey, *OzTiVo – Toys, Tools, Hacks and a Community*, Proceedings of the Linux Conf Australia, Canberra, April 2006.

H. Larkin, Z. Wu, W. Toomey, *Predicting Network Topology for Autonomous Wireless Nodes*, Proceedings of the 11th European Wireless Conference (EW’05), April 2005.

H. Larkin, Z. Wu, W. Toomey, *Algorithms for Predicting Node Connectivity in Wireless Ad-hoc Networks*, Proceedings of the 2005 International Multiconference in Computer Science and Computer Engineering (ICWN’05), June 2005.

W. Toomey, *Comparing C Code Trees*, Proceedings of the Australian Unix Users Group winter conference, Sydney, August 2005.

W. Toomey, *OzTiVo – Toys, Tools, Hacks and a Community*, Proceedings of the Australian Unix Users Group winter conference, Sydney, August 2005.

W. Toomey, *Installing and Configuring FreeBSD*, invited workshop given at the AUUG Winter conferences in 2000 and 2001.

W. Toomey, *Making Closed Source Unix Open Again*, Third Australian Open Source Symposium, June 2001.

W. Toomey, *Teaching Systems Administration*, seminar given to the Canberra chapter of SAGE-AU in 2000.

W. Toomey, *Saving UNIX from /dev/null*, 1999 AUUG Canberra Summer Conference, Canberra, February 1999. Presented again at the national AUUG conference, Melbourne, September 1999.

W. Toomey, *A Look at Recent Network Security Vulnerabilities*, seminar given to the Canberra chapter of the Network Professionals Association, July 1997.

W. Toomey, *Installing and Configuring FreeBSD*, invited workshop given at the AUUGWet'97 conference, Darwin, February 1997.

W. Toomey, *Monitoring Network Connection Attempts on a FreeBSD Server*, 1996 AUUG Canberra Summer Conference, Canberra, February 1996. Presented again at the national AUUG conference, Melbourne, September 1996.

W. Toomey, *The PDP-11 Unix Preservation Society*, 1996 AUUG Canberra Summer Conference, Canberra, February 1996.

W. Toomey, *FreeBSD*, keynote address at QUESTnet'95, Bond University, September 1995.

Theses

W. Toomey, *A Rate-Based Congestion Control Framework for Connectionless Packet-Switched Networks*. Thesis submitted to the University of New South Wales for the degree of Doctor of Philosophy, November 1997.

W. Toomey, *An Implementation of GKS in C*. Dissertation submitted to the University of New England in part fulfillment of the requirement of Honours in Computing Science, November 1988.

Administration

Administrative Responsibilities

Within School/Faculty

Member of the AACSB Taskforce, 2007-2009

Associate Dean, Teaching & Learning, 2006 – 2007

Chair of Faculty Teaching & Learning Committee, 2006 – 2007

Member of Faculty Teaching & Learning Committee, 2005 – 2007

Member of School Technical Support Committee, 2005 – 2006

Curriculum Review Committee, 1993 – 2001

Information Systems 1st Year Co-ordinator, 1996 – 1999

Teaching Committee of the ADFA IT Review Working Party, 1994

Computer Science 2nd Year Co-ordinator, Semester 1, 1993

University-Wide

Member of Emerging Technologies Committee, 2012

Member of Teaching & Learning Committee, 2006 – 2007

Proposed Computer Engineering Degree Committee, 1993 – 1996

Other Professional Involvements

Member of the Australian Unix Users Group Executive, 2001 - 2002

Chair and Secretary of the Canberra Packet Radio Group, 1994 – 1996

Referees

Richar Barrett, Director of CIBEIT Faculty, TAFE Queensland Gold Coast
E-mail: Richard.Barrett@tafe.qld.edu.au. Phone: +61 7 5581 8960.

Gavin Finnie, retired Professor of Information Systems, Bond University.
E-mail: gfinnie@internode.on.net. Phone: +61 7 5530 4063.

Paddy Krishnan, Developer, Oracle Labs Brisbane.
E-mail: paddykrishnan@ieee.org. Mobile: 0481 322 421.

Steven Sugden, Lecturer, School of Mathematical Sciences, QUT.
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