Wayne Piekarski (PhD)

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Expert in Augmented Reality, Virtual Reality, Mobile 3D User Interfaces, and Software Development

Highly developed technical skills in both hardware and software, and have used this to lead teams in the development of exciting new technology. Over 10 years of experience in academia and industry. Recognised within the international community as a leader in the areas of augmented reality, virtual reality, wearable computers, and 3D user interfaces. Searching for the keyword "outdoor augmented reality" in Google brings up my web site as the first item. Developed a number of new and innovative research projects, including acquiring necessary grants and students to make them a reality. Wide range of diverse skills in many hardware and software fields. Ability to manage and work with teams of people in a competitive environment. Highly flexible and able to learn new skills and technology quickly. Ability to troubleshoot and fix technical problems quickly, thrives under pressure and deadlines. Passionate about using and designing new technology, and solving problems with creative solutions.

Augmented Reality – Virtual Reality – Mobile and Wearable Computing – 3D User Interfaces – Research
Linux – Software Development – C/C++ – Python – Operating Systems – Troubleshooting and Support
Leadership and Management – Teaching – Customer Interaction – Public Speaking

PROFESSIONAL EXPERIENCE

Qualcomm Bay Area R&D (BARD), Santa Clara, CA (September 2010 - Present)

Staff Engineer:

- Researching new technologies for future Qualcomm chipset designs

WorldViz LLC, Santa Barbara, CA (July 2007 – September 2010)

Virtual Reality software/hardware development and integration company

Development Manager:

- Leading the design, development, and integration of large US$100k-$1M+ virtual reality systems for WorldViz.
- Management, development, and testing of the Precision Position Tracker system, a 6DOF optical tracking system supporting multiple markers in large environments.
- Customer application design, integration, and programming – designing solutions for large customer virtual reality installations, including CAVEs, HMDs, and motion capture systems, and leading integration amongst vendors.
- Provide leadership in software engineering and development methodologies for company programmers, and design and manage software source control repositories and backup systems.
- Provide engineering and research experience to the sales and development teams, including contacts within the industry and academia.
- Attend conferences and high-end customer sites to meet with current and potential customers, gather customer requirements, and perform software programming and installations.

Major Accomplishments:

- Improved ability to track software development using better software engineering methodologies.
- Architected a generic device abstraction library to reduce time and costs associated with developing customer and demonstration 3D applications in Vizard.
- Development of Demo DVD showcasing Vizard toolkit to improve sales and customer awareness.

- Successfully designed and integrated software to support a large MechDyne CAVE, four Sensics head-mounted displays, and a four person Motion Analysis mocap system, for use in collaborative CAD studies, value $2M+.
- Completed the design and development of the WorldViz PPT-H and PPT-E cameras and firmware, improving resolution, accuracy, and range over the existing PPT-X product line.
- Designed processes to streamline and improve the reliability of conference and customer demonstrations for the sales team.

University of South Australia, Adelaide, SA (April 1999 – June 2007)

Senior Lecturer (equivalent to US Associate Professor)

- Co-Director of Wearable Computer Lab and founding member - http://wearables.unisa.edu.au
- Course coordinator and senior lecturer in operating systems, computer graphics, and database design
- Currently maintain an Adjunct Senior Research Fellow position

Major Achievements:

- Designed the Tinmith hardware and software platform for outdoor augmented reality
- Instrumental role in the development of the Wearable Computer Lab into a lab of high international standing in the augmented reality and wearable computing research community.
- Chaired an IEEE/ACM international conference (ISMAR), chaired two national conferences (AUIC), and served on more than ten international program committees (VR, ISWC, ISMAR).
- Published over 35 internationally refereed conference papers, 8 journal articles, a book chapter, edited 2 conference proceedings, and given many invited talks and demos. Publishing in the most reputable conferences and journals in my field, such as those by IEEE, ACM, and Eurographics.
- Leadership roles in international organisations, university and division committees, and co-director of the Wearable Computer Lab.
- Obtained approximately AU$400k in funding and equipment to sponsor research activities.
- Supervised and graduated three PhD students, one associate PhD, and numerous past undergraduate students.
- A number of awards from both the university and national organisations recognising my achievements in research and teaching.

University of North Carolina, Chapel Hill, USA (Sept 1999 - Dec 1999)

UNC-CH ranked number one in Computer Graphics research in 1999

Visiting researcher at the Department of Computer Science

- Participated in classes, research group meetings, and assisted with various projects

SE Network Access Pty Ltd, Adelaide, Australia (April 1996 - May 2001)

Largest Internet company in Adelaide until sold to OzEmail for A$15M+.

Manager of Research and Development

- Reported directly to the company owners, responsible for rapid and strategic software development.
- Lead and develop core infrastructure within the company.

Major Achievements:

- Designed and developed a complete ISP billing and accounting system (UM – User Manager).
- Deployed User Manager systems at SE Net and sold to other ISPs in South Australia.
- Designed and developed Australia's first online grocery store.
- Designed Swish widget toolkit, used for developing CGI-based web applications in C on Unix systems.
- High-level consulting for major government and industry contracts.

TECHNICAL EXPERIENCE

Augmented reality, virtual reality, and computer graphics

- High performance OpenGL graphics programming.
- Detailed understanding of most 2D and 3D algorithms and mathematics.
- Experience in low level frame buffer programming.
- Implementation of augmented reality and virtual reality applications.
- Design and construction of 3D input devices and techniques for interaction with VR and AR systems.
- Development of embedded mobile systems that implement AR in a mobile outdoor environment.
- Optical, magnetic, inertial, gyroscopic, GPS, and ultrasonic 3D tracking systems.

Programming and tools

- Unix-based C/C++ development using GNU tools (GCC, GDB, Emacs).
- Windows-based C/C++ development using Microsoft Visual Studio development tools and Unix Cygwin tools.
- Versioning control systems for software development (Subversion, CVS, and GIT).
- Detailed operating systems knowledge, memory protection, file systems, I/O, CPUs, hardware, and system calls.
- BSD sockets API, complex TCP/IP client/server applications, Bluetooth, and troubleshooting network problems.
- Building custom Debian/Ubuntu Linux systems for use in embedded and mobile computers.
- Programming in Python and Bash scripting languages.
- Administration of Linux, Windows, FreeBSD, and OS X systems.
- Development of toolkits for developing CGI-based web interfaces to SQL databases.
- Intel 80x86, Motorola 68000, and 68HC11 assembly language.
- Familiar with Java, PHP, Basic, and Pascal.

EDUCATION

Doctor of Philosophy (PhD), University of South Australia (1999-2004)

Thesis title: Interactive 3D Modelling in Outdoor Augmented Reality Worlds.

- Supervised by Professor Bruce Thomas.
- More information available at **http://www.tinmith.net/wayne/thesis**
- Awarded APA scholarship from the Australian government, Tall Poppy Science Award, Vice Chancellor's Award for Innovation, AUIC 2002 best student paper, and Division of ITEE best publication awards.

Bachelor of Engineering in Computer Systems Engineering, University of South Australia (1995-1998)

- First class honours.
- Awarded the Keith Johinke Medal, University of South Australia Medal, Chancellor's Award List, Dean's Merit List, six subject prizes, and scholarship.

FURTHER INFORMATION

- References available upon request
- Complete list of publications and other expanded career and academic information is available from the Internet addresses **http://www.tinmith.net/wayne** and **http://www.tinmith.net/papers/piekarski-cv-full.pdf**