WAYNE PIEKARSKI (PHD)

San Jose, California, USA
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Expert in Mobile and Wearable Computing, Virtual and Augmented Reality, Internet of Things, C++ Software Engineering, Research, Linux, Android, Public Speaking, and Open Source

Highly developed technical skills in both hardware and software, and have used this to lead teams in the development of exciting new technology. Over 20 years of experience in industry and academia. Software engineering as well as building tools for developers to use. Recognised within the international community as a leader in the areas of the wearable/mobile computers, augmented reality, virtual reality, Internet of Things, and 3D user interfaces. 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, and then teach other developers. Ability to troubleshoot and fix technical problems quickly under pressure. Passionate about using and designing new technology for real-world usage, and solving tough problems with creative solutions.

PROFESSIONAL EXPERIENCE

Reality Labs at Meta, Burlingame, California, USA (May 2023 – Present)

Software Engineer – AR/VR (Reality Labs)

- Software development for Reality Labs augmented reality and virtual reality systems

Google, Mountain View, California, USA (Feb 2014 – Mar 2023)
Staff Developer Advocate – Fuchsia, Android Things, Assistant, Android Wear, Android Auto, Android TV, Glass

Staff Developer Advocate (L6):

- Develop tools and SDKs for Fuchsia developers, and create training for Fuchsia hardware driver development.
- Educate developers about mobile and wearable technologies related to Android and the Google Assistant.
- Advocate for developers internally in the company, ensuring they have the right tools and information.

Major Accomplishments:

- Worked on developer advocacy for many of Google's leading products in Android and the Google Assistant.
- Produce videos, blog posts, and social media posts to educate developers. Mentor junior team members.
- Launch strategies and planning, sample code, bug fixing, SDK testing, and documentation for each platform.

Qualcomm Research Silicon Valley (QRSV), Santa Clara, California, USA (Sept 2010 – Feb 2014)
Multi-core Hardware and Software Research Group

Staff Engineer:

- Research into multi-core and heterogeneous computing problems on mobile Android-based devices.
- Understand Qualcomm Snapdragon system-on-chip and provide guidance for hardware and software architecture.
- Design software tools to simplify multi-core programming for C++ programmers.

Major Accomplishments:

- Detailed understanding of multi-threading on Android using C++11 threads, pthreads, and ARM atomics.
- Designed new and improved existing tools for performance measurement and profiling of Android applications.
- Detailed knowledge of Qualcomm's Android system, and porting open source software to build with the NDK.
- Work in team that developed MARE, a C++ task-based parallelism library for Android devices.
- Work in team that developed Zoomm browser, a HTML5 browser rewrite with a multi-core design (PPoPP 2013)

WorldViz LLC, Santa Barbara, California, USA (July 2007 – Sept 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.
- 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.

Major Accomplishments:
- 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+.
- Managed and completed the design and development of the WorldViz PPT-H and PPT-E cameras and firmware, a 6DOF optical tracking system, improving resolution, accuracy, and range over the existing PPT-X product line.
- Designed and produced physical hardware for head tracking and 3D input devices for CAVE systems based on the PPT optical tracking system.

University of South Australia, Adelaide, South Australia (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.

Major Achievements:
- Designed the Tinmith and ARQuake hardware and software platform for outdoor augmented reality.
- Worked with Hewlett Packard Labs in the development of watch-based computing prototypes.
- 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, 1 US patent, a book chapter, edited 2 conference proceedings, and given many invited talks and demos.
- Obtained approximately AU$400k in funding and equipment to sponsor research activities.
- Supervised and graduated three PhD students, one associate PhD, and numerous undergraduate honors students.

University of North Carolina, Chapel Hill, North Carolina, 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 as well as research within the company.

Major Achievements:
- Designed and developed a complete ISP billing and accounting system (UM – User Manager).
- Designed and developed Australia's first online grocery store in 1998.
- High-level consulting for major government and industry contracts.

TECHNICAL EXPERIENCE

High level knowledge

- Design of Linux, Android, and Fuchsia, and their underlying SDKs and development tools.
- Detailed operating systems knowledge, memory protection, file systems, I/O, CPUs, hardware, and system calls.
- Implementation of augmented reality and virtual reality applications on mobile wearable computers.
- Design and construction of 3D input devices and techniques for interaction with VR and AR systems.
- Development of applications for head-mounted, immersive CAVE, handheld, and watch-based displays.
- Understanding of most 2D and 3D algorithms and mathematics, low-level frame buffer programming.
- Optical, magnetic, inertial, gyroscopic, GPS, and ultrasonic 3D tracking systems.
- Development of custom electronics to use as prototypes for research.
- Development of deep-ocean underwater robots.

Programming and tools

- Android-based Kotlin/C++/Java development using the NDK/SDK tools, with external open source software.
- Linux-based development with C++ and assembly language.
- Windows-based C++ development using Microsoft Visual Studio development tools and Unix Cygwin tools.
- Writing graphical user interface applications using Android, Qt, OpenGL.
- PCB design using KiCAD, 3D prototyping and printing using OpenSCAD and PrusaSlicer.
- Versioning control systems for software development (Git, Gerrit, GitHub, Subversion, CVS).
- Development of firmware and timing critical code for cameras running real-time operating systems.
- Programming for multi-core devices, dealing with weak memory models, atomics, and locking.
- BSD sockets API, non-blocking TCP/IP client/server applications, Bluetooth, and fixing network problems.
- Building custom Debian/Ubuntu Linux systems for use in embedded and mobile computers.
- Programming in Bash and Python scripting languages, as well as Sed, Awk, Javascript, and PHP.
- Detailed knowledge of Linux, Android, Windows, and OS X systems.
- Plugin and app development for the X-Plane 11 flight simulator.

EDUCATION

Doctor of Philosophy (PhD), University of South Australia (1999-2003)
Thesis title: Interactive 3D Modelling in Outdoor Augmented Reality Worlds.

- Supervised by Professor Bruce Thomas.
- More information, PDF and images, 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.
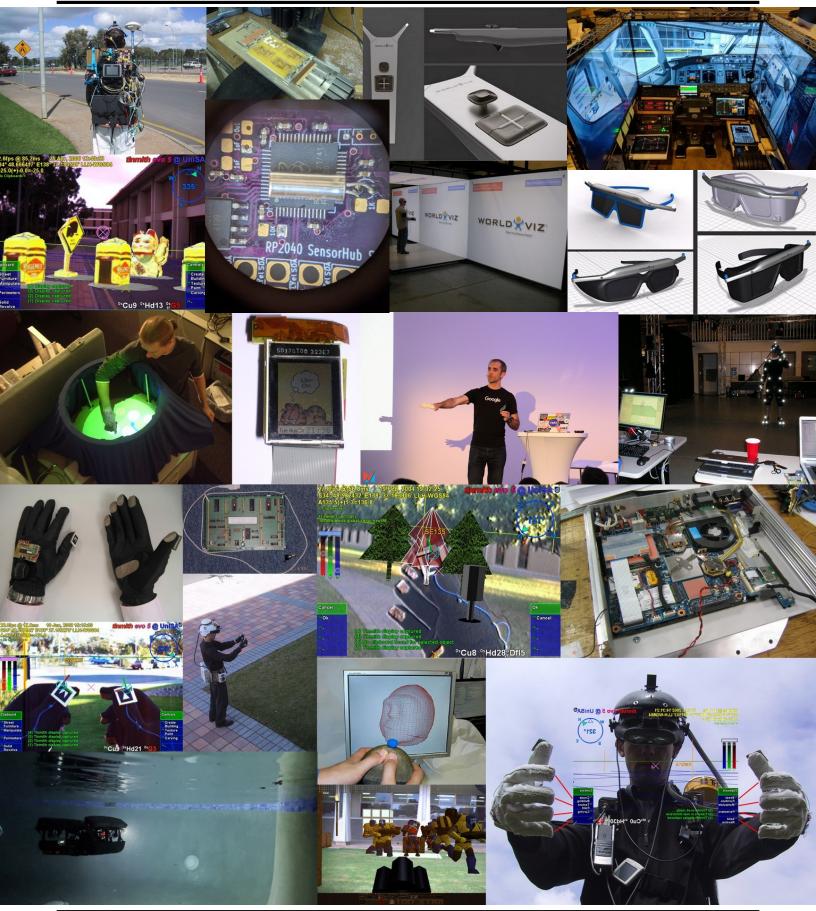
Bachelor of Engineering in Computer Systems Engineering, University of South Australia (1995-1998)

- First class honours. Ranked #1 of all students in CSE class graduating in 1998.
- 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 **http://www.tinmith.net/wayne** and **http://www.tinmith.net/papers/piekarski-cv-full.pdf**