Paul C Roberts

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I have a record of strong technical leadership and original, creative solutions to complex software design and implementation challenges. I am able to preserve the global vision of a project alongside the attention to detail necessary for rapid and successful results.

I take great pride in my ability to write high quality code rapidly; as a professional developer I have used (in no particular order) C#, C++, C, Java, JavaScript, Python, TypeScript, and have a working familiarity with a handful of other languages.

PROFESSIONAL EXPERIENCE

Google March 2018 – Present
Staff Software Engineer C++, Java, TypeScript, GNU/Linux, Windows, MacOS, hg
Kirkland, WA

Google Meet
Technical Lead for Trust & Compliance for Google Meet, supporting:

- Lawful Intercept
- Legal Takeout
- Data Location and Sovereignty
- Access Management and Control
- iOS Nutritional Labels
- Cookie Compliance

Created a prototype integration of Google Meet in-room experience and project Starline

- Worked to integrate existing UX resource with Starline
- Provided on-going support to the product team

Designed Call History infrastructure for Google Meet and Google Voice
Worked on prototype implementations for a cross-plaform next generation Google Meet client

- Bootstrapped the project within Google's build system, including making the project build across MacOS, Windows, and Linux
- Wrote a test framework for the system's unique application environment
- Ported WebRTC
- Helped the team implement WebRTC in an ActiveX plugin to provide end-of-life support for IE11

Amazon July 2016 – January 2018
Principal Engineer C++, Python, Java, Javascript, Computer Vision, Machine Learning, GNU/Linux, git
Seattle, WA

Amazon Go
Provided technical leadership on the Person Tracking team for Amazon's ground breaking cashierless store.

- Built innovative software to help move the project from research to production.
- Optimized core real time algorithms
- Using accelerometers to detect and debug vibration issues

Dropbox May 2013 – June 2016
Software Engineer Python, Go, C++, Java, JavaScript, React, GNU/Linux, git, hg
San Francisco, CA

Product Security
Worked on all levels of the Dropbox stack in improving the security of user facing services

- Built an authorization monitoring system that allows measurement of authorization invariants at runtime
- Completely reimplemented production secret distribution: four languages (python, go, c++, java); hundreds of secrets; tens of thousands of servers; 0 down time. New system has better security properties, logging, monitoring, alerting and is more flexible
- Fixed vulnerabilities as reported by security researchers
- Implemented robust html sanitizing for transcluded content
- Migrated several hundred legacy admin pages to safer templating language, fixing CSRF and XSS vulnerabilities in the process

API Team
Hack-a-sprint — Implemented Dropbox api v2 for .Net

Microsoft July 1999 – April 2013
Principal Software Engineer C#, C, C++, F#, Win32, XAML, JavaScript, XSLT, Perforce, git
Redmond WA (2002 – 2013), Cambridge UK (1999 – 2002)

Midori
Jan 2012 – April 2013
An operating systems research project

- Re-wrote the process loader to work with cloud-based binary images

Robotics Initiative
2005 – 2011
Designed the architecture and led development for an applied robotics project ("Mars"), including:

- Overall architecture and design for robotics and cloud components
- Engineering quality initiative: patterns and practices; code reviews; code coverage
- Wrote application model and hosting: owning and implementing components in C#, C++, ATL, and Silverlight

Designed the architecture and led development for an applied robotics project ("Marvin") that was presented to the MS Senior Leadership Team in Oct 2009.

- On a project with 11 developers I wrote ~40% of the new code used to create a functional prototype, including: application lifecycle control; UI and UX (implementation and design tools); application composability; Kodu integrations

Worked as part of the team that defined and shipped Microsoft Robotics Developer Studio from the first CTP in June 2006, through to the final release. I worked on all layers of the system

- Fixing bugs and extending CCR and DSS
- Writing services to interact with a wide variety or robotics hardware
- Writing services to simulate hardware in a virtual environment
- Vision processing services
- Tutorials and documentation
- Microsoft VPL - a dataflow language for robotics orchestrations, implemented: interpreted runtime; transpiler; remote debugger

Windows Security
2002 – 2005
Lead developer for the UI/UX for BitLocker full volume encryption

- Control panel, Wizard, MMC snap-in, internal tools

Working on the UI/UX for a secure operating system.

- Red-Green project, building working prototype including ActiveX, Virtual Server, WMI
- Defined basic axioms for creating a secure UI in a hypervisor environment

- Mechanisms for defending against various levels of spoofing attack on a system with Secure IO
- Created Secure UI architecture for the Palladium/NGSCB platform
- Lead a team of developers to create working UI prototypes for Palladium
- Helped develop and implement HASE methodologies within the team, mentoring developers on best practice.

Wireless Telephony Group, Europe
1999 – 2002
Developing micro-browser software, targeting embedded platforms with as little as 32KiB RAM

- Responsible for security protocol implementations for Mobile Explorer (a platform agnostic micro-browser), implemented WTLS and SSL
- Participated in the Security SIG at the WAP forum
- Implemented clean-room JPEG, GIF, and PNG decoders
- Implemented WMLScript - both compiler and runtime
- Maintained and developed core architecture of codebase that was used by 3 different projects across 9 different hardware platforms, using HASE methodologies

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STNC Ltd Oct 1997 – July 1999
Senior Software Engineer C, C++, GOC, Epoc-32
Cambridge, UK

Micro-browser development
Developing mobile web and WAP browser technologies for cell phones

- Code reviews and architectural presentations to Microsoft as part of acquisition
- Implemented ECMAScript (Edition 2)
- Worked on core micro-browser technologies: demonstrated W3C compliant graphical browser on a cell phone in 1998, shipped web technologies in Symbian EPOC-32, upgraded browser to work on Geoworks GEOS

Systems Options Ltd March 1994 – Oct 1997
Analyst Programmer C, C++, Win16, COM/OLE
Aldershot, UK

Working on Desktop GIS software
Win16, COM and OLE2 development, spatial analysis, data visualization, legacy database integration, initial web-server interfaces

EDUCATION

University of Cambridge 1990 – 1993
Peterhouse

BA, History and Philosophy of Science

PUBLICATIONS, PATENTS

Click Passwords
IFIP International Information Security Conference 2006

Methods and Systems for Generating Encryption Keys Using Random Bit Generators
United States 6931128 Issued August 6, 2005

Click Passwords
United States 7243239 Issued July 10, 2007

Push Secure End-To-End Notification
United States 7299349 Issued November 20, 2007

Systems and Methods for Authenticating a User Interface to a Computer User
United States 7661126 Issued February 9, 2010

Providing Secure Input And Output To A Trusted Agent In A System With A High-Assurance Execution Environment
United States 7496768 Issued February 24, 2009

Providing Secure Input to a System with a High-Assurance Execution Environment
United States 7464412 Issued December 9, 2008

Security State Watcher
United States 7574610 Issued August 11, 2009

Systems and Methods for Determining If Applications Executing on a Computer System are Trusted
United States 7721094 Issued May 18, 2010

Systems and Methods for Demonstrating Authenticity of a Virtual Machine Using a Security Image
United States 7565535 Issued July 21, 2009

Distributed Debugging for a Visual Programming Language
United States US-2008-0209405-A1 Filed August 28, 2008

Visual Programming Language Optimization
United States US-2009-0064092-A1 Filed March 5, 2009

Automation of networked devices
United States 9413606 Issued August 9, 2016