

# Bretton Wade

*Visionary / Software Engineer*

Bretton.Wade@gmail.com  
(410) 710-7918  
github.com/brettonw  
www.brettonw.com

## Summary

I am **always learning**.

I have **deep expertise in algorithms and data structures** used in the simulation of scientific phenomena, machine learning, imaging, image processing, and vehicle dynamics (modeling, controlling, and tracking for space, air, water, and ground-based vehicles).

I maintain a **broad skill set** in modern software development using imperative, object-oriented, and functional languages and ecosystems for front-ends, back-ends, databases, cloud computing, mobile platforms, and graphics hardware.

I am **focused on practical implementations** of ideas that make the world a better place to live, through research and discovery in scientific communities and commercial applications of new ideas.

I thrive in a **passionate, upbeat environment** focused on excellence, where I can help solve hard problems.

**TS/SCI Cleared**, with a CI Poly (October 2017). Fully Vaccinated.

## Experience

### **PRESIDENT / PRINCIPAL ENGINEER**

IR - Inbound Research, LLC (December 2018)

- \* Secret Clearance for DoD, Public Trust for US and UK civilian agencies.
- \* (U) Software support for University of New Hampshire IMAP-Lo science team.
- \* (U) Design, implement, test, and document algorithms for processing IBEX-Lo and IMAP-Lo science data from L0 to L3 in the container-based AWS workflow specified by the Laboratory for Atmospheric and Space Physics (LASP) Science Data Center (SDC).
- \* (U) 3D and 2D Visualization of satellite orbits for Omitron (NASA Prime) on a commercial Space Situational Awareness (SSA) project.
- \* (U) Software support on US and allied government programs for Leidos via NannaTek, capturing scanned paper forms and extracting data for tax data processing, censuses, and document retention.
- \* (U) Responsible for scanner interface software and job configurations for BancTec, IBML, and Kodak scanners used to image paper forms.
- \* (U) Design and develop imaging and image processing software in support of the analysis of scanned forms with high accuracy requirements (> 99%).
- \* (U) Design and develop "dashboard" applications to visualize status in the workflow graph, reflect audit trails, and debug faults in the processing.

## Skills

Agile / JIRA / Confluence / Scrum  
C++ / C# / Java / Scala  
Objective-C / Swift  
Perl / Python / Bash / PowerShell  
MacOS / Windows / Linux  
iOS / Android / Raspberry Pi  
IBML / BancTec / Kodak / MISB  
Docker / Jenkins  
Maven / Ant / Eclipse / XCode / VS  
Git / SVN  
HTML / Javascript  
Tomcat / HTTPD / IIS / Node  
SQL / MongoDB  
AWS / Spark / Hadoop  
DirectX / OpenGL / WebGL / CUDA

## Education

### **Master of Architectural Science**

*Program of Computer Graphics*  
Cornell University, Ithaca, NY  
Kernel based density estimation for global illumination

### **Bachelor of Architecture**

*5-Year Professional Degree Program*  
Virginia Tech, Blacksburg, VA  
Tools for computational support of design process

## Professional Affiliations

Association for Computing Machinery (ACM)

ACM Special Interest Group in Graphics (SIGGRAPH)

Institute of Electrical and Electronics Engineers (IEEE)

IEEE Computer Society (CS)

## Experience (continued)

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### **PRESIDENT / PRINCIPAL ENGINEER (continued)**

iR - Inbound Research, LLC (December 2018)

- \* (U) Design and develop an autonomous Group 1 drone platform, including hardware, airframe, and flight-controller software..
- \* (U) Design and develop a distributed sensor and actuator architecture for remote automation.
- \* (U) Support and extend Bedrock, a secure microservice architecture used for prototyping and rapid deployment.
- \* (U) Design, implement, and Support a media index architecture for ingesting and tagging social media and continuously scrolling web applications.
- \* Software support for entrepreneurial projects in public health (TSG) and direct imaging of on-orbit satellites for insurance purposes (Chandah Space).
- \* C#, Java, C++, C, Perl, Bash, Powershell, SQL, Javascript, Python, Docker, AWS, EC2, Git, Jenkins.

### **PRINCIPAL SOFTWARE ENGINEER**

Alion Science (March 2018)

- \* Secret Clearance for DoD.
- \* (U) Software engineering in support of DoD Project Maven.
- \* (U) Software engineering in support of JHU-APL Project Minotaur.
- \* (U) Build “deep learning” applications and tools for image and video, responsible for algorithm design and development of training sets to identify people and vehicles in drone footage.
- \* (U) For MISB 0601 and 0903 stream formats, responsible for the architecture of a standards-compliant video processor with visual quality metrics.
- \* (U) Member of Motion Imagery Standards Board (MISB).
- \* (U) Design and develop tools to automate internal configuration of new camera/data sources.
- \* Javascript, HTML, OpenGL, CUDA, C++, Perl, Bash.

### **PRESIDENT / PRINCIPAL ENGINEER**

iR - Inbound Research, LLC (September 2017)

- \* TS/SCI Clearance w/ Counter-Intelligence Polygraph (CIP) for NSA.
- \* (U) Software as a Service (SaaS) / Micro-Service prototyping tools and integration methods under the brand name Bedrock.
- \* (U) Web-based visualization of solar and lunar eclipses using Javascript and GL.
- \* (U) Modern tools for rapidly building and testing applications in C++.
- \* (U) Micro-controller integration with external hardware interfaces to motors and sensors for Internet of Things (IoT) platform and research in autonomous vehicles/robotics.
- \* (U) Farm optimization, including drone control and simulation algorithms for data collection in fields.
- \* (U) Pursue SBIR grants in the area of super-resolution imagery as a generalization of the Drizzle algorithm.
- \* (U) B2B contract engineering on Leidos Long-term Sustainment Contract (LSC) supporting the National Geospatial Intelligence Agency (NGA).
- \* Java, Javascript, HTML, CSS, C#, C++, Perl, Bash.

### **CONTRACT ENGINEER / PARTNER**

Sonix IO (January 2017)

- \* Design, document, develop, and deploy prototype services and prototype mobile apps for standardizing augmented audio code (AAC) signaling frameworks.
- \* Transitioned contract role to Inbound Research (see above) after incorporation.
- \* Java, Javascript, Objective-C, Swift, HTML5, CSS, AWS Elastic Beanstalk, MongoDB, and Docker.

### **PRINCIPAL ENGINEER**

Applied Defense Solutions (September 2014)

- \* TS/SCI Clearance for AFRL.
- \* (U) Software Architect on DARPA/AFRL SBIR grant project for Space Situational Awareness (SSA), responsible for design and implementation of a distributed workflow processing engine fronting a Spark compute cluster with NoSQL backing store.
- \* (U) Software Architect on DARPA prototype for space battle management command and control (BMCC), using networked game technology to rapidly create and deploy a testbed for defining BMCC 20 years into the future.
- \* (U) Supported researchers in SSA developing advanced solutions for a variety of research problems.

## Experience (continued)

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### PRINCIPAL ENGINEER (continued)

Applied Defense Solutions (September 2014)

- \* (U) Physics simulations and visualizations with PID controllers for satellite and space vehicles.
- \* Java, Javascript, HTML5, CSS, Apache Spark, AWS Elastic Beanstalk, MongoDB, and Docker.

### PRINCIPAL ENGINEER

Next Century Corporation (April 2012)

- \* TS/SCI Clearance w/ Full Scope Polygraph (FSP) for NSA.
- \* (U) Developed reusable user interface components in Ozone Widget Framework (OWF) using Java (server-side) and Javascript (client-side).
- \* (U) Developed tree and graph visualizations for extremely large datasets with no a-priori knowledge of the natural hierarchy of the data.
- \* (U) Designed and developed strategies for analyzing massive data sets to extract and identify patterns.
- \* (U) Developed visualization algorithms for "Pattern of Life" analysis in large datasets.
- \* (U) Designed and developed a client-side high-performance NoSQL database in JavaScript, with SQL-like query capabilities.
- \* (U) Designed and updated ExtJS-based user interfaces with and without using a MVC pattern.
- \* (U) Worked on "cloud" based distributed computing environments for big data based on Hadoop, using the Pig query language.
- \* (U) Supported and extended graph-based visualization for the Deep Exploration and Filtering of Text (DEFT) family of algorithms, developed using Maven and Spring data components with Neo4J in a Groovy language platform in OWF.
- \* (U) Designed and developed an Android-based prototype for location based encryption and decryption.

### SOFTWARE ARCHITECT / CONSULTANT / ENTREPRENEUR

Self Employed (May 2011)

- \* Design and develop software for image processing and location-based algorithms in client and server applications.
- \* Clients include Global Alert Network, Mobile Traffic Network, Mobixity, MapHook, and Taylor Technologies.
- \* Specify and implement development processes (SCM, Build Environments, Deployment, etc.).
- \* Develop and patent algorithms for image analysis and camera calibration in quality-sensitive chemical testing applications.
- \* Build mobile client applications for location-based alerting services running on iPhone and Android platforms.
- \* Design and develop algorithms for tracking users on the client and server-side using imperfect information.
- \* Develop machine-learning applications that project users locations based on pattern-of-life.
- \* Build mobile client for iPhone location-based blogging app, MapHook.
- \* MySQL, Objective-C using XCode for iOS, and Java using IntelliJ Idea for Android and Tomcat.

### SENIOR SOFTWARE ENGINEER

Nannatek for Lockheed-Martin (October 2008)

- \* Public Trust Clearance.
- \* Responsible for scanner interface software and job configurations for Banctec, IBML, and Kodak scanners used in the US, UK, and Canadian censuses.
- \* Design and develop imaging and image processing software in support of USA, UK, and Canada census programs.
- \* Combined, these three programs processed more than 100M paper responses.
- \* Design and develop software for image analysis and camera calibration in quality-sensitive document imaging systems.
- \* Design and implement improved imaging algorithms used for dropout and data recognition on scanned documents.
- \* Design and develop tools to automate document template construction from scanned exemplars, turning a week-long manual process requiring skilled experts into a one-hour hands-off process.
- \* R&D, Graphics hardware implementations of image processing algorithms (GPGPU).
- \* Oracle SQL, dot.NET, and C# using Visual Studio on Windows XP.

### SOFTWARE ARCHITECT / CONSULTANT / ENTREPRENEUR

Self Employed (January 2007)

- \* General development services in a variety of languages and environments, including dot.NET, C#, and Java for web applications; SQL for database applications; C++, C#, Objective C, and Java for mobile and game applications.

## Experience (continued)

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### **SOFTWARE ARCHITECT / CONSULTANT / ENTREPRENEUR (continued)**

Self Employed (January 2007)

- \* Clients include Rubin-Anders Scientific, Square Loop, Virilion, Promotional Commerce, and Inquirium.
- \* Build and maintain e-commerce applications for company store services.
- \* Build mobile client applications for location-based messaging and alerting services running on Nokia S60, Windows Mobile, iPhone, Android, and Java J2ME platforms.
- \* Build a customizable user-interface library for Java J2ME (flip) phones.
- \* Implement advanced rendering techniques for special effects in XNA Game Studio for a museum display in a new Holocaust museum.
- \* Build high-performance cache-conscious spatial-database library for simulations.
- \* Build core data-structure library and text-parsing library for linking the simulation library to a variety of systems employing text protocols (HTTP, NMEA, XML, SQL, CSV, etc.).
- \* Build high-precision numerics library employed for symbolic manipulation, geometric calculations, and cryptographic services.
- \* Analyze source code and implementations for litigation in software patent disputes.
- \* Independent ventures in mobile games, consumer applications, social networking, and mobile banking.

## Experience (Ancient History)

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### **DIRECTOR OF TECHNOLOGY**

Firaxis Games (August 2005)

### **INSTRUCTOR (Part-Time)**

University of Washington (April 2002)

### **GRAPHICS PROGRAM MANAGER**

Microsoft Xbox Base Software (September 2003)

### **LEAD SOFTWARE DESIGN ENGINEER**

Microsoft Games Studios / Flight Simulator Team (September 2000)

### **RESEARCH SOFTWARE DESIGN ENGINEER**

Microsoft Research (May 1999)

### **RESEARCHER**

Advanced Rendering Technology (ART) (February 1999)

### **MEMBER OF TECHNICAL STAFF**

Silicon Graphics, Inc. / Cosmo Software (February 1997)

### **SOFTWARE ARCHITECT**

Qualia Games (August 1995)

## Automatic Recruiting Filter Section

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1995, Pixar. Not really, but I know people there. This whole section is tongue in cheek to get around automated resume filters. It will work with a high degree of certainty. Skip to the last point and don't bother reading it.

1992, Experienced user of Microsoft Office (Word, Excel, PowerPoint) and Google Search engine where I find what I'm looking for 99.95% of the time at 9nm process accuracy.

2012, Anonymous accounts on Instagram, Facebook, and Twitter, with thousands of followers and almost no influencer persona.

2011, Linked-In account. I almost never login to it, and I don't typically treat it like social media.

2012, Netflix, HBO user with thousands of shows watched and lots of critique for Game of Thrones.

1995, Visited university campuses at Massachusetts Institute of Technology (MIT), Harvard, UC Berkeley, Princeton, Johns Hopkins, and CalTech. I have colleagues on projects representing University of Utah, UNC, Brown University, University of Washington, University of Virginia, and University of Maryland, and etc.

2013, Reddit is a source of funny things, like this:

[https://www.reddit.com/r/recruitinghell/comments/qhg5jo/this\\_resume\\_got\\_me\\_an\\_interview/](https://www.reddit.com/r/recruitinghell/comments/qhg5jo/this_resume_got_me_an_interview/)

1984, Apple Macintosh user responsible for leading many people in many teams with much improvement, and building lots of products.

1993, Microsoft Windows user with nVidia and ATI GPUs, Intel and AMD processors, and many Gb of memory

2011, Installed wireless networks and remote access toolsets using Cisco, Ubiquiti, and Netgear hardware with comcast/XFINITY branded gigabit ethernet.

2018, Tesla. I didn't buy a car, but I like Electric Vehicles (EVs) and bought their stock. It was a good move at the time. I might buy SpaceX when it goes public. Elon Musk bought all my Twitter stock. Interested in FinTech and automated trading technology, especially in block-chain and crypto finance.

2021, If you actually read this, tell me your favorite movie quote in your response to my cover letter.