Bryan Turner

Senior Software Engineer

Development · Web · Cloud

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Turning cloud problems into clear solutions with modern functional programming.

Cloud Development	**Enterprise Development**	**Web Development**
Microservices	Distributed services: SaaS/PaaS	HTML5/CSS3/ES2015
AWS Integration	Continuous fault-tolerance	Single-Page Apps
SQL/No-SQL	Paxos consensus protocol	Isomorphic Apps
DevOps Automation	Properties-Based Testing	Progressive Loading
(Build, Test, Integrate)	Deployment/Rollback	Platform Integration
Fuzz testing	Multi-master databases	(Facebook, etc.)

SHORT BIO

Bryan has a rare expertise in **consensus protocols** for fault-tolerant distributed systems, the core skill needed to implement **enterprise-grade cloud services** with five-nines availability and strong consistency. He authored a survey article on this topic which became Wikipedia's entry on the Paxos Consensus Protocol *[see publications]*. His tireless pursuit of software innovation has generated **40 patents**, and over 30 more in process.

Bryan maintains **full-stack web development** skills including rendering web content in HTML5/CSS3/ES2015 as well as deployment to modern serverless architectures on popular cloud providers like AWS (**Amazon Web Services**), Google, Microsoft, and IBM.

Bryan has also tackled the complete chain of **consumer product development** for his entrepreneurial businesses. From graphic design in **Adobe Illustrator**, modeling of new parts in 3D **CAD** (Computer Aided Design) software, programming cutting strategies with **CAM** (Computer Aided Manufacturing) software, as well as machining the exotic metal parts on his **CNC** (Computer Numeric Control) mills and lathes.

With 15 years' experience in **functional languages**, Bryan is prepared for the next generation of software development. He envisions a future of **compositional microservices**, on-demand scalability, deeply integrated security, and continuous fault-tolerance to meet the demanding, high-volume service infrastructure of tomorrow.

PROFESSIONAL WORK

Software Engineer 2011-Present

Cisco Systems, SPNS : Service Provider Network Systems / IOS-XR

- Embedded Router OS Development
- Fault-Tolerant Server Architectures;
  - FT-TCP, FT-SSH, DDoS-mitigation
- US Patents; 40 issued, 37 pre-grant
- Cisco Media Solutions Group, Technical Reviewer
- MIT Media Lab, Technical Liaison
- Cisco Research Center, Technical Reviewer

Software Engineer 2008-2011

Cisco Systems, GGSG : Global Gov. Services Group

- Multi-Master Paxos Protocol
- Designed Language and Compiler for Fault-Tolerant Software
- Multi-Master Database with Parallel/Concurrent Updates
- Mesh-Network Robotics Control System
- Advanced Services Support (GGSG/AS)

Software Engineer 2001-2008

Cisco Systems, Technology Center

- Distributed OLTP Applications Platform
- Semantic Search Engine
- Bayesian Recommendation Engine
- P2P Video Streaming
- P2P Services Platform
- P2P File System
- VoIP (Voice over IP) Embedded Phone GUI

Associate Systems Developer 1998-2000

SAS Institute Cary, NC

- Designed a flexible element layout system for Multi-Dimensional DB display and exploration
- Implemented user interaction GUI for document editing similar to PowerPoint
- Achieved near-perfect report reproduction in HTML and RTF formats
- Implemented core technologies for new MFC-based reporting application
- Developed unique DLL for Windows 95/98 providing Unicode support for any application
- Re-implemented product architecture to eliminate race conditions

Part-Time Cooperative Education Programmer 1997

Peracom Corp. RTP, NC

- Designed and implemented a Universal Serial Bus test suite and monitor application
- Contributed to the design of value-add software for new USB products in development
- Intel assembly for new USB product device driver

Cooperative Education Programmer 1995-1996

Alphatronix Raleigh, NC

- Succeeded in customer site-repair of software in Leeds, England and Charlotte, NC
- Reverse-engineered proprietary protocols over Ethernet
- Improved an image conversion system and archival database
- Designed new GUI for improved customer productivity and satisfaction
- Optimized image processing algorithms
- Automatic database analysis/repair utility

ENTREPRENEURSHIP

CAD / CAM / CNC Programmer + Machinist 2016-Present
Grave Raven Durham, NC

- Product design, development, and manufacturing
- Quality control and process control
- Materials sourcing, cost modeling
- Product & packaging design
- Marketing: organic social media engagement & paid media advertising
- Website design, sales funnel optimization, SEO

Product Development / Web Developer 2016-Present
DBA Bryan Turner Durham, NC

- Stock management, distributor selection, product selection
- Market development, digital advertising
- Product photography, copywriting
- Dye chemistry, process improvement, root-cause analysis for batch failure

EDUCATION

North Carolina State University, College of Engineering (Raleigh, NC) - Cum Laude 1998
Bachelor of Science in Computer Science, minor in Business Management

US PATENTS, 40 Issued

Selected Examples:

8,819,653 - Automated improvement of executable applications
8,437,281 - Distributed real-time data mixing for conferencing
8,301,897 - Challenge-based authentication protocol
8,271,687 - Streaming network coding
8,051,170 - Distributed computing with determined capacity requirements
7,752,311 - Gracefully changing a node in a distributed computing network
7,739,390 - Achieving optimal transfer times in a peer-to-peer network
7,694,335 - Preventing server attacks with computational challenge in handshake
7,562,125 - Placement of distributed objects based on physical communication costs
7,552,464 - Techniques for presenting network identities at a human interface
7,457,835 - Optimizing distributed database latency by moving data
7,440,971 - Pre-caching content at remote client
7,023,989 - Application delivery to VoIP telephony device

PUBLICATIONS

Publications, Professional

· *How to Become a Software Engineer*
https://www.howtobecome.com/how-to-become-a-software-engineer-2

· *Real-Time 3D Terrain Rendering — GameInstitute.com course + textbook*
Web Archive Copy:
https://web.archive.org/web/20011127130703/http://www.gameinstitute.com:80/gi/courses/coursedescription.asp?courseID=7
Original:
http://www.gameinstitute.com:80/gi/courses/coursedescription.asp?courseID=7

· *Real-Time 3D Landscape Rendering*
http://www.gamasutra.com/features/20000403/turner_01.htm

Publications, Non-Professional

· *Paxos Family of Consensus Algorithms*
Current Revision:
Paxos (computer science) in *Wikipedia, The Free Encyclopedia*
http://en.wikipedia.org/wiki/Paxos_(computer_science)
Turner, Bryan. Primary contributor: 18:11, 19 October 2007.
Original Work:
http://www.fractalscape.org/2007/10/01/paxos-family.html

· *State Machine Approach '08*
Current Revision:
State Machine Replication in *Wikipedia, The Free Encyclopedia*
http://en.wikipedia.org/wiki/State_machine_replication
Turner, Bryan. Primary contributor: 20:06, 13 March 2008.
Original Work:
http://www.fractalscape.org/2008/02/01/state-machine-approach.html

· *Efficient Byzantine k-Anonymous Broadcast*
http://www.fractalscape.org/2006/08/01/efficient-byzantine-k-anonymous-broadcast.html

· *Byzantine k-Anonymous Broadcast in $O(Nf^2)$ Messages*
http://www.fractalscape.org/2006/08/15/byzantine-k-anonymous-onf2.html