v1.1.0

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I am a software developer with full-stack experience looking for challenging and fulfilling work where I can make a significant impact. I am passionate about designing and developing complex technical systems to solve real-world problems at significant scale and making data-driven decisions.

Education and Technical Skills

University of Virginia School of Engineering and Applied Sciences *August 2009 - May 2013*
B.S. in Computer Science *Charlottesville, VA*

Programming Languages
Proficient in Java, Python, Javascript, HTML, CSS, various Shell flavors
Frameworks
Extensive experience with Flask, various AWS services, Angular 1, Docker
Databases
Amazon DynamoDB, Postgresql, Redis, InfluxDB, Elasticsearch

Professional Experience

Software Development Engineer II *August 2015 - July 2016*
Amazon - **Search Experience** *Seattle, WA*
- Worked on massive codebase involving hundreds of developers across multiple organizations.
- On-call for the primary services powering Amazon's search, which handle peak traffic of >10,000 requests per second. Drove resolution for dozens of high severity customer-impacting issues. Helped improve operational excellence of team by removing redundant alarming and adopting metrics-based system monitoring.
- Implemented critical solution in conjunction with several other organizations to reduce unnecessary downstream traffic by >99%, enabling downstream systems to handle the massive scale accompanying Amazon's Prime Day. Facilitated load testing of this solution prior to Prime Day.

Software Development Engineer *June 2014 - August 2015*
Amazon - **Marketplace** *Tempe, AZ*
- Worked on small team of fewer than 12 developers managing dozens of microservices, including development, testing, on-call rotation. All code written met unit testing quality bar of >90% coverage.
- Developed critical infrastructure as part of multi-year migration from legacy Oracle database to a scalable DynamoDB based solution, with design vetted by Amazon Principal Engineers. This service handles >5000 requests per second worldwide, with >five 9s of Availability.
- Resolved internal and external customer issues involving simple database updates to large-scale customer migration scripts.
- Promoted after one year.

Software Development Engineer in Test *August 2013 - June 2014*
Microsoft Corporation - **Application Insights** *Seattle, WA*
- Leveraged existing frameworks from different groups to implement a UI automation framework for web-based product portal, along with ~20 automated test cases for critical functionality (~20k LLOC of C# within framework, ~2k LLOC written by me).
- Automation framework revealed several product bugs, many of which I also fixed.
- Maintained development environments utilized by entire product team.
- Promoted after six months.

Android and Backend Developer *August 2012 - December 2012*
HoosEating *Charlottesville, VA*
- Smartphone application to help students find free food around college campus in conjunction with one

other developer (**no longer active**)
- Developed Android client and backend data scripts to interface with Parse cloud services and Google Calendar API
- Over 300 users within two weeks of launch across Android and iPhone

DevOps Intern *May 2012 - August 2012*
WillowTree Apps *Charlottesville, VA*
- Worked on large-scale Django project developing API endpoints and fixing bugs (~26k PLOC in Python)
- Developed tools for management of and worked with backend databases (Postgresql and Redis)
- Researched potential uses of graph databases and presented findings to the company

Undergraduate Researcher at University of Virginia *June 2011 - February 2012*
Programming Languages Group (under Wes Weimer) *Charlottesville, VA*
- Published peer-reviewed research paper at the International Symposium on Software Testing and Analysis (28% acceptance rate), "A Human Study of Patch Maintainability." http://dl.acm.org/citation.cfm?id=2336775
- Helped organize and carry out a human study to investigate software maintainability, involving examination of open source C programs and the collection of data from over 150 participants and statistical analysis of data
- Contributed to a long term, ongoing research project involving >14000 PLOC in OCaml

Open Source Contributions

Cachual (github.com/bal2ag/cachual) *Ongoing*
- Python framework for caching function return values with a simple decorator (**Beta** status)

Flask-Cachual (github.com/bal2ag/flask-cachual) *Ongoing*
- Flask extension for the Cachual library (**Beta** status)

Kadabra (github.com/bal2ag/kadabra) *Ongoing*
- Python framework for recording metrics from applications (**Beta** status)
- Includes a client API for easily recording metrics from application code, and a reliable asynchronous agent for publishing metrics into a backing store

Flask-Kadabra (github.com/bal2ag/flask-kadabra) *Ongoing*
- Flask extension for the Kadabra framework to automatically record per-request metrics from Flask applications (**Beta** status)

Flexo *Ongoing*
- Python service framework (**Pre-Alpha** status; still in development)
- API modeling, simple API input validation, automatic generation of service clients, and more
- Ask me about it in person!

Speaking

"Tips and Tricks for Building a Scalable Cloud Service" *March 2015*
HackArizona 2015 *Tucson, AZ*
- Tech talk presented to college students during a hackathon at the University of Arizona on behalf of Amazon.
- Room at capacity with >50 in attendance. Talk was ~40 mins with ~20 minutes of questions.

Teaching

High School Computer Science Teacher *August 2014 - May 2015*
TEALS at BASIS Phoenix *Phoenix, AZ*
- Co-taught Advanced Placement (AP) Computer Science to 15 high school students, along with the

primary teacher at the school and another volunteer through the TEALS (Technology Education and Literacy in Schools) program.
- Walked students through basic programming language concepts including variable assignment, branching, loops, classes, objects, polymorphism, and recursion in preparation for the AP test.
- 86% of students passed, as compared to 71% the previous year and 65% worldwide. Of the passing students, 85% received a score of 5 or 4.

Computer Science Tutor *Spring 2013*
University of Virginia *Charlottesville, VA*
- Tutored 4 students in various introductory CS classes throughout the semester, helping them study for exams and assisting with homework questions for approximately 10 hours/week.

Teaching Assistant for "Program and Data Structures" *Spring 2012*
University of Virginia *Charlottesville, VA*
- Helped students learn basic C++ and accomplish weekly programming assignments.
- Graded assignments, helped proctor weekly labs and periodic exams, and held weekly office hours.