

Todd Sullivan

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Experience:

Software Development Engineer III, Reading Mining & Analytics team, Kindle org, Amazon.com

April 2013 – Present, Technologies: Everything

Read the Amazon history from September 2009 to present for better context.

- Changing the way Kindle makes decisions via the team's Reading Behavior Analytics platform.
- Turning the Before You Go feature in to a mature platform for merchandising experiments.
- Designing the next generation of asset delivery for auxiliary content to optimize for reduced operational burden, lower bandwidth costs, and increased development speed for new features.
- Working on unannounced projects that will appear here in time.

Software Development Engineer II, Reading Mining & Analytics team, Kindle org, Amazon.com

November 2011 – March 2013, Technologies: Hadoop, Java, AWS (EC2/S3/RDS/EMR/DynamoDB/...), Search

Following the release of X-Ray and the success of Before You Go, the Learning Machines team split in to three teams including the Reading, Mining, & Analytics team that I founded.

- Responsible for the entire team organization from best practices to system architecture to sprint planning to future projects.
- Led the creation of the Reading Behavior Analytics platform from idea through to reality. RBA is changing the way merchandising teams create campaigns, author acquisition teams identify and evaluate promising authors, and feature teams prioritize projects.
- Designed and was the primary implementer of a new Popular Highlights pipeline after the original pipeline could no longer handle the load from the substantially larger Kindle user base in comparison to 2009. The system has run untouched since early 2012.
- Changed the book search experience from local indexing of content to pulling the index from the server on book download, thereby reducing the time between book download and when the book is searchable, increasing battery life, and reducing UI sluggishness that was caused by local indexing.
- Designed and created the delivery system that all Kindle features now use to deliver their auxiliary content along with the book (ex: X-Ray, Page Numbers, Popular Highlights, Before You Go, Public Notes, Author Bios, etc.)
- Played an advisory role and provided expert knowledge for the creation of the Hadoop-based system that powered the original version of Amazon Author Rank.
- Oversaw the spread of the Before You Go feature across device platforms.

Software Development Engineer II, Learning Machines team, Kindle org, Amazon.com

October 2010 – October 2011, Technologies: Hadoop, Java, Ruby on Rails, AWS (EC2/S3/RDS/EMR/...)

- Led a team of 5 in creating the Before You Go feature that provides closure and recommendations on what to read next when a reader reaches the end of a book or sample. Responsible for original business requirements, UX, and technical implementation. Before You Go is the primary driver for customer reviews written in the e-book category and has achieved explosive, additive sales growth as a merchandising platform.
- Led the device-side UX and implementation of Public Notes which allows readers to view the highlights and notes of friends as well as the book's author, all inline while reading on Kindle.
- Built the Kindle N-Gram Corpus on short notice for the original launch of X-Ray. The n-gram subsystem was crucial for increasing the performance of the named entity recognition system.

Software Development Engineer I, Learning Machines team, Kindle org, Amazon.com

September 2009 – September 2010, Technologies: Ruby on Rails, Java, JavaScript/CSS/HTML, AWS

- Founding (and sole) developer for the sharing features on the Kindle. Primary developer of the server-side portion.
- Member in a team of 8 in developing kindle.amazon.com and the original Popular Highlights feature.
- Cover a wide range of responsibilities including Kindle device work, backend service development, and web development. Was active in projects from concept through production deployment.

Natural Language Processing Consultant for PowerReviews Inc.

June 2008 – March 2009, Technologies: Hadoop, EC2/S3, WordNet, Dependency Trees, Entity Recognition

- Single-handedly designed, developed, tested, and deployed a system that extracts pros and cons from product review text for millions of product reviews spanning thousands of product categories.
- Sole designer and developer of a system for spawning and managing Hadoop clusters on Amazon EC2 (including submitting arbitrary jobs and managing multiple clusters at the same time) through a simple, intuitive Java API.

Automated Reasoning Applications at Stanford

September 2007 – June 2009

- Led a team of 7 engineers in building a robotic assistance system for changing lanes on highways.
 - Sole architect/developer of the car detection and tracking subsystem.
 - Primary author of the paper in the proceedings of the AAAI 2010 Spring Symposium.
- Led a team of three in creating a propositional satisfiability solver.
 - Fastest solver out of 7 teams.
- Developed, in a team of three, a constraint satisfaction problem solver for solving crossword puzzles.
 - Sole architect/programmer except on AC3 and forward checking which were pair programmed.
 - Fastest solver out of 7 teams.
 - 10 times faster than 2nd place team.
- Created a job shop scheduler using temporal slack heuristics and multiple constraint propagation methods.
- Implemented the general purpose STRIPS planner Identidem in a team of two.
 - Designed the best planning domain out of 7 teams.
- Tech Lead in a team of three that created a system for navigating a quadruped robot over uneven terrain.
 - 2nd place out of 14 teams.
 - 1 of only 2 teams that could consistently navigate the hardest terrain difficulty.

Natural Language Processing Research and Applications at Stanford

September 2007 – June 2009

- Created multiple systems for predicting the pros and cons that a reviewer tagged for a product based on the reviewer's rating, location, review text, submission time/day, and other information. Used maximum entropy classifiers, support vector machines, naïve Bayes, and combinatorial search.
- Led a team of three in creating a system for predicting the geographical region that speakers live in from audio-based product reviews. Sole creator of the context-dependent Gaussian Mixture Models.
- Collaborated in a group of three to design, develop, and evaluate a Java software package (GARI) for automatic relationship induction using learned syntactic patterns by generalizing R. Snow's technique for automatic hypernym discovery to work with any word relationship in a plug-and-play manner.
- Developed, through studies at Stanford, many language models, a machine translation system, acoustic speaker identification system, CKY Penn Treebank parser, and a maximum entropy sequence classifier for labeling proteins, DNA, RNA, cell lines and other biological entities in text.

YabbleBabble

<http://www.yabblebabble.com> (Archive of August 2007 site)

November 2004 – August 2007 (Sold August 9, 2007)

Technologies: PHP, MySQL, JavaScript, CSS, XHTML

YabbleBabble was an e-commerce company that allowed crafters and artists to sell their products online.

- Founder. Conceived, designed, and developed the entire e-commerce system.
- Managed the group of 150+ crafters and artists that sold 1,500+ products through the service.
- Managed the day-to-day operations of providing customer support, marketing, and ensuring the prompt shipment of all orders.

GPGPU Research under Prof. Chi-Ren Shyu

February 2007 – May 2007

Technologies: GPGPU, BrookGPU, Cg, C++, Java

Led a four-person team in converting a portion of IPSA, a Java-based protein structure comparison algorithm, for GPU processing that included profiling IPSA and developing prototypes for the GPU-based IPSA section.

- Designed, developed, and evaluated the profiler, Java-C++ interaction, and GPU-based section.
- GPU-based IPSA section was 9.828 times faster than its Java-based counterpart.

Honors Undergraduate Research under Prof. Yi Shang

June 2006 – May 2007

Technologies: TinyOS, OPEN-R, Tekkotsu, Java, C++, nesC, MySQL

- Independently integrated a wireless sensor network with a network of Sony AIBOs.
- Created a server that facilitates message transfers and sensor queries.
- Developed a database logging utility for archival data analysis and storage of state histories.
- Built demonstration programs that run on the Sony AIBOs.

University of Missouri-Columbia Engineering Entrepreneurs

June 2006 – May 2007

- Founder and President.
- Provided overall direction, facilitated all activities, and delegated responsibilities to members.
- Obtained campus-recognized student organization status and grew membership to 125+ students.
- Developed the organization's constitution, bylaws, and website.

FIRST Lego League Head Team Coach

August 2006 – January 2007

- Taught children to construct and program robots using LEGO Mindstorms NXT technology.
- Guided children in the research and presentation process for the challenge.

DaySign: Freelance Website and Multimedia Development *July 2002 – August 2005**Technologies: Flash (Actionscript), PHP, MySQL, JavaScript, CSS, XHTML, Sony Sound Forge, Sony Acid*

Created websites, concept designs, e-commerce systems, and more. The following is a select list of projects:

- Designed and created a unique Flash-based e-commerce system for Lu Lu Josephine Clothing Company of Kansas City, Missouri.
- Designed and developed business and fan-based model portfolio websites for Christina Helton.
- Created a concept design for the Kharis Clothing e-commerce website (Atlanta, Georgia).
- Lead developer in a team of six people that created and maintained the Park Hill High School website.
 - Independently designed and managed the overall website structure, Future Business Leaders of America, cheerleading, girls' basketball, and 2004 state champions football websites.
- Composed and sold two electronic music CDs under the artist name Cycle Music.
 - Developed the website, the content on the CDs, and the extra content on the CD cases.
- Founded and managed a LAN party group that regularly held events with 40+ participants.
- Developed PorkChOps.net, a community for Park Hill High School students that included games, an instant messenger, and other Flash applications.
- Created the website and infrastructure for Welsch Enterprises' The Tassel Is Worth The Hassel program that allowed the St. Joseph School District in St. Joseph, Missouri to sell personalized products for each school.
- Created the website and managed the community for the 2002 Kansas City People to People Student Ambassador delegation to Australia and New Zealand. Was also a 2002 delegate.

Education:**Stanford University** *4.0 GPA*

Master of Science in Computer Science	<i>2007 – 2009</i>
Specialization in Artificial Intelligence	

University of Missouri-Columbia *4.0/4.0 GPA*

Bachelor of Science in Computer Science	<i>2004 – 2007</i>	<i>4.0 Major GPA</i>
Honors Research Scholar		

Bachelor of Science in Mathematics	<i>2004 – 2007</i>	<i>4.0 Major GPA</i>
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Honors and Awards:**Nationally Competitive**

National Defense Science and Engineering Graduate (NDSEG) Fellow	<i>2007 – 2010</i>
Phi Kappa Phi Fellowship Award of Excellence	<i>2007</i>

University of Missouri-Columbia

Mizzou '39	<i>2007</i>
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One of the top 39 seniors at MU as chosen by the Mizzou Alumni Association based on academic achievement, leadership, and service.

E. W. Mares and Dr. Kenneth R. Mares Scholarship and Academic Award	<i>2006</i>
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Undergraduate award recognizing research excellence in the sciences, social sciences, and the humanities.

Outstanding Student Award – Computer Science	<i>2006, 2007</i>
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One of two awarded juniors (2006) and only awarded senior (2007) as voted by the Computer Science Faculty.

Curtis L. Benton and Barbara Kortright Benton Scholarship - Finalist	<i>2006</i>
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Award for students who have demonstrated, through actual applications, the ability to create practical solutions to real problems.

To view academic transcripts, degrees, research projects, multimedia portfolio, and more, visit my website.

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