

professional summary

For the last twelve years, I've specialized in designing and building analytic software systems, using techniques from artificial intelligence, machine learning, statistical analysis, computational linguistics, and pattern recognition.

I've built cluster-maps of the worldwide corporate landscape using multi-terabyte datasets, and created sophisticated behavioral analysis software for movie-watchers and music-listeners. I've contributed to criminal investigations by finding correlations in electronic forensic data, and I've identified failure modes of mechanical systems using linguistic analysis of automotive warranty databases. I've modeled missile defense simulations, and I've studied heat emissivity patterns in the vascular structures of the human face.

I'm a passionate team leader, building consensus among stakeholders and leading the way in finding elegant solutions to complex computational problems. I thrive in small company environments, building teams of clever engineers, identifying strategic opportunities, and designing algorithms to make sense of massive amounts of data.

recent work experience

Senior Research Engineer, ZoomInfo, May 2010 to Present

ZoomInfo creates and markets an enormous directory of continuously-updated information about companies and the people who work for them, using sophisticated natural language processing and a wide variety of intelligent systems.

Accomplishments:

- Advocated a rigorous methodological approach toward testing and validation of classification accuracy on all projects, ensuring continued improvement of Zoom's massive dataset. Designed a sampling methodology to drive high accuracy yield. Hired a full-time statistician to oversee further development of this data-quality methodology.
- Proposed, designed, and implemented a new set of algorithms for classifying companies into "industry clusters" using linguistic evidence gathered from a swarm of web-crawlers.
- Designed a novel approach for "cyclic retraining" to quickly identify and correct errors in the ground-truth for large-scale supervised learning systems.
- Designed and built a new rule-system (including a language grammar, parser, and execution engine) for classifying members of the workforce according to an ontology of job-functions and management hierarchies.

Software Engineer, Charles River Analytics, October 2008 to April 2010

Charles River Analytics is a defense department contractor working on cutting edge R&D projects for the Army, Navy, Air Force, and DARPA. In the "Cognitive Systems" division, focused on modeling, comprehension, and augmentation of human cognition in a military context. Responsibilities include grant proposal authorship, project management, travel for client presentations, and technical implementation.

Accomplishments:

- Wrote winning Phase I & II grant proposals, raising more than \$2 million from the Defense Advanced Research Project Agency (DARPA) for research in infrared analysis of the human face. Served as technical lead on the project, which used facial heat maps to identify stress, anxiety, uncertainty, and fatigue in experimental subjects. Solicited university collaborators and hired experts in facial-recognition. Created budgets and allocated funds for personnel and equipment. Developed algorithms for the extraction of statistically significant features from the visible and

long-wave thermal infrared spectra. Designed an experimental protocol for data collection and hypothesis validation. Delivered a successful implementation and presented detailed analysis of our results to a satisfied client.

- Served as Technical Lead on a \$600K research project for the Missile Defense Agency. Implemented a simulation system using Monte Carlo methods to evaluate tens of thousands of enemy missile attack scenarios and the relative efficacy of various RADAR defense configurations. Deployed a 3D geospatial visualization system rendering all simulation results as a volumetric cloud, enabling strategic RADAR planners to perform exploratory analysis of simulation results.

Independent Consultant, November 2007 to October 2008

Developed and delivered custom software solutions to clients in aerospace/defense and medical research industries. Assessed client needs, defined project requirements, planned project schedules, and provided regular status reports to key stakeholders. Key clients include Raytheon Corp and the Columbia University Medical School.

Senior Scientist, MatchMine, March 2007 to November 2007

MatchMine developed a vendor-neutral platform for content discovery. Much like Amazon or Netflix compute recommendations from the purchase and rental histories of their users, MatchMine facilitates the delivery of recommendations from third-party content providers to their customers, based on a statistical preference model of the individual user, and of the user community at large.

Accomplishments:

- Proposed a statistical behavioral framework (using vector-space mathematics) to model the multidimensional attributes of our core recommendation system.
- Hired a small team of research scientists, with specializations in computational linguistics and statistical information modeling, to flesh out the implementation details of the core algorithmic model.
- Developed a suite of prototyping and testing tools for the development and enhancement of core algorithms, including functionality for analyzing density distributions and vector magnitude histograms within the multidimensional space, and for performing similarity analysis between content items, users, user groups, and user archetypes.
- Designed and implemented a multi-threaded, context-directed web crawler –with the ability to predict link-target document quality – to fulfill the company’s content acquisition strategy.

Research Team Lead, Oakley Networks, July 2005 to March 2007

Oakley Networks develops specialized network security software for managing insider threat risks. Oakley’s software enables its users to create policies restricting the transfer of sensitive intellectual property on the network, and to take action upon detection of policy breaches.

Accomplishments:

- Managed a team of developers working on a variety of research and analytical projects, including compiler tools, classification engines, indexing tools, and rules-based logic engines.
- Developed a domain-specific language – and implemented the compiler – for Oakley’s security software. Language features included: static type-checking, namespace-aware symbol resolution, multiple inheritance, abstract classes, anonymous inner classes, integrated unit tests, and API doc generation.
- Proposed and developed a novel file-type identification algorithm using supervised learning techniques, including byte frequency indexing, agglomerative clustering, and probabilistic index reduction to produce fast and accurate results from a set of tiny “fingerprint” files.

- Developed a new technique for conducting massively parallel search operations through transient text documents using deterministic finite automata. This technique enabled the software to perform tens of thousands of simultaneous search operations per document in a fraction of the time previously required.

Computational Linguist, Attensity Corp, December 2002 to March 2005

Attensity's linguistic software reads English-language documents, producing parse trees from the source text and performing transformations on those trees to enable complex analysis of the entities, events, and relationships discussed within the text.

Accomplishments:

- Served as technical lead on a \$250K pilot project for a large government account, including the maintenance of the primary customer relationship. During the project's three-month timeline, my four-man team delivered an implementation that resulted in over \$1.5M in licensing revenue and an additional \$1M in service contracts.
- Hand-picked to lead a turnaround team on critical project, a three-month assignment to improve the linguistic classification accuracy of a major project for the company's biggest client. At the conclusion of the project — with accuracy more than doubled — the client signed a \$2M contract for an extension of services.
- Developed a four-day training course to teach members of the intelligence community, from various federal agencies, how to use Attensity software in their own linguistic analysis projects. Traveled to Washington DC on many occasions to deliver that course.
- Contributed to the company's core linguistic IP, including the development of parsing heuristics, named entity extraction rules, and part-of-speech disambiguators.

languages & tools

Java • SQL • ActionScript/Flex
C# • WPF/XAML • Python • Perl • PHP • HTML • JavaScript
Eclipse • Netbeans • Visual Studio .NET • Subversion • CVS • Apache Server • Jetty
RallyDev • Jira • Confluence • MySQL • MS SQL
Windows • MS Office • Linux • Cygwin

media

[**You Want Innovation? Offer a Prize**](#)

quoted in the **New York Times**, on January 31, 2007

education

Coursework in Computer Science (2002-2003)

University of Utah, Salt Lake City, Utah

Bachelor of Arts in Theatre/Playwriting (1995-2000)

Brigham Young University, Provo, Utah