Kevin Sprong

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Languages

Proficient: Python, R, SQL, Pig, Hive, Bash

Familiar: Java, JavaScript, Scala, Clojure, LaTeX

Tools, Frameworks: Hadoop, Spark, d3.js, Angular, Git, Maven, Scipy

Experience

Akamai Technologies **Cambridge, MA**

Senior Performance Engineer *April 2015–Present*

Develop software and data pipelines to manage capacity allocation and assess + improve the performance of Akamai's mapping system. Analyze complex system behavior and use data to influence internal stakeholders and drive business decisions.

- Created Hadoop-centric workflows to store and analyze key data used in understanding Akamai's mapping system. Designed and implemented data models, ingest processes, and analytic jobs to leverage Terabytes of disparate data. Reduced size of primary data source twenty-fold through improved data modeling and compression. (Python, Pig, Hive, Avro, Spark, Scala)
- Deployed data pipeline and statistical model to track content cacheability as a function of disk occupancy. Created automated processes managing ETL, non-linear statistical modeling, web visualization, and database views for internal stakeholders. (R, SQL, Python, Angular)
- Developed software features for capacity allocation for high-traffic customers on Akamai's secure edge network. Analyzed historical data to determine allocation strategy; wrote and tested software implementation. (Python, Perl, SQL)

The MITRE Corporation **Bedford, MA**

Lead Computer Scientist *2013–2015*

Performed air traffic system modernization research using Hadoop and related technologies in support of the Federal Aviation Administration. Applied a combination of software engineering, mathematical and statistical analysis, and web visualization to drive data-mining research questions from idea to final result against large datasets.

- Developed MapReduce workflow to extract and analyze lateral track deviations during initial departure climb. Created interactive web visualization of results to provide a deeper understanding of causal factors. (Java, d3, dc.js, Hadoop)
- Deployed fully automated ETL processes, data models, and web services to transform raw ARINC procedure data into modeled objects available as a REST service. (Python, Pig, MongoDB, Node)
- Produced assessment of airport navigation service needs using data-driven criteria applied to multiple diverse datasets. Delivered results via web and desktop applications allowing interactive results exploration and sensitivity analysis. (R, Python, Pig, Angular, d3)

BBN Technologies **Cambridge, MA**

Scientist *2010–2013*

Performed analysis and modeling of sensor system technologies for customers including Defense Advanced Research Projects Agency (DARPA). Developed and analyzed signal processing approaches and complex system models, conducted field test data collection and processing, and contributed to customer presentations and reports.

- Implemented and analyzed coherent localization and probabilistic classification algorithms for transient vibration detections, providing solutions to several key customer objectives. (Matlab)
- Developed parametric model of system response to known signal injection in order to estimate environmental parameters. Used non-linear optimization techniques to extract damped sinusoids from noisy data. (Matlab/Simulink)
- Delivered Java software package which converted encoded measurement information into engineering units using signal processing techniques for further processing and analysis. (Java)

The MITRE Corporation **McLean, VA**

Project Team Manager *2003–2010*

Initially hired as a simulation modeling engineer, then successively promoted to senior simulation modeling engineer and project team manager at MITRE's Center for Advanced Aviation Systems Development. As project team manager, responsibilities included management of seven engineering staff and approximately $3.5M in research for the Federal Aviation Administration.

- Managed seven engineering staff developing air traffic control workload and complexity models, providing more accurate inputs to FAA staffing models. (Java)
- Supervised and mentored talented engineering staff, ensured quality of work product deliverables, and provided performance assessment and review.
- Developed software package allowing fast-time generation of aircraft vertical profiles as built by advanced flight management systems, with modeled estimates of fuel flow and aircraft emissions, enabling new categories of research. (SLX)
- Developed and applied an airport and aircraft simulation model to analyze annual benefits and capacity gains resulting from implementation of advanced navigation procedures. (SLX)

Education

Johns Hopkins University **Baltimore, MD**

M.S., Systems Engineering, GPA – 3.80 *2009*

Relevant Coursework: Software Systems Engineering, System Design and Integration, Management of Systems Projects

University of Virginia **Charlottesville, VA**

B.A. with Distinction, Mathematics, GPA – 3.74 *2003*

Phi Beta Kappa. Relevant Coursework: Operations Research, Linear Algebra, Probability and Statistics, Ordinary Differential Equations, Software Development Methods, Discrete Mathematics

Selected Publications

Analysis of Atlantic Interoperability Initiative to Reduce Emissions (AIRE) Continuous Descent Arrival Operations at Atlanta and Miami

Sprong, K., et al. *October 2008*

27th Digital Avionics Systems Conference

Analysis of Advanced Flight Management Systems (FMS), Flight Management Computer (FMC) Field Observations Trials, Vertical Path

Herndon, A., Mayer, R., Cramer, M., Sprong, K. *October 2007*

26th Digital Avionics Systems Conference