

# Joshua Bers

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## ***Summary & Skills***

I enjoy solving challenging software problems through efficient innovation. I have over 15 years of experience developing and deploying distributed software systems for both commercial and government customers. Skills: staff management, C/C++, Java, SQL, Perl, TCP/IP, UML & Python.

## ***Education***

A.B., Computer Science, Dartmouth College, 1993

M.S., Media Arts and Sciences, Massachusetts Institute of Technology, 1995

Statistical Pattern Recognition Class, Boston University, 1998

## ***Experience Summary***

### **Akamai Technologies, 2011 – Present**

2014 Feb - Present – Senior Business Systems Analyst, Billing Analytics Team

2011 Jan – 2014 Jan – Engineering Manager, Distributed Data Collection group

### **BBN Technologies, 1995 – 2010**

2002-2010 – Senior Software Engineer, Advanced Networking Systems

1999-2002 – Software Architect / Engineering Manager, Commercial Speech Solutions Group

1997-1999 – Research Software Engineer, Speech and Language Processing Department

1995-1997 – Software Developer, Network Products Group

## ***Professional Responsibilities and Projects***

As a Business Analyst at Akamai, I perform data-driven analysis of product profitability. This includes capturing usage data of distributed computing resources, working with finance team to understand reporting requirements and modeling the costs of the entire suite of products.

Previously I managed a team of 26 software, QA, release and operations engineers that develops, tests and maintains a cloud-based system to ingest and process usage logs from all of Akamai's edge servers. This BigData system includes more than 3,000 servers and processes more than 2 peta-bytes of data per day.

Prior to joining Akamai, I developed network management systems, multi-modal speech recognition applications and robotic control systems at BBN Technologies. I was co-Principal Investigator on an NSF funded project that deployed a large-scale sensor network in Cambridge, MA, called CitySense.

### **Content Delivery Network (Akamai Technologies: 2011 – Present)**

#### **Billing Analytics: Akamai's Corporate Systems (2014-Present)**

Analyze usage data from globally distributed network to measure profitability of products and customers. Work with product teams and developers to understand their resource usage model. Identify key metrics and design method for their reliable measurement. Aggregate and transform metrics into monthly cost reports broken down by geography, customer & product.

#### **Distributed Data Collection (DDC): Akamai's Log Processing Network (2011-2014)**

Led team to develop optimizations to a distributed map-reduce architecture that resulted in over \$1.8M in annual savings and decreased the time to deploy new products. Promoted the development of a new Hadoop-based service (DDR) to meet challenge of storing and analyzing very large data sets. My focus on software quality through improved QA test coverage has reduced the number of emergency software releases from 5 in 2010, prior to my arrival, to 2 in 2011, 1 in 2012 and none in 2013.

### **Advanced Networking Systems (BBN Technologies: 2003 – 2010)**

#### **Network Management: DARPA's Wireless Network after Next (2009 – 2010)**

Developed a network management system for an embedded, handheld, radio device for the US Army. The tool enabled graphing of hundreds of key performance metrics from a multi-hop wireless network. The management system also provided SNMP read/write access to system control parameters for real-time tuning. Specific responsibilities included: serving as the customer's point of contact for data collection and analysis, managing the development of a GUI for data analysis. (C, SNMP, MySQL, Python and OPNET).

#### **Sensor Networks: NSF CitySense (2006 – 2010)**

Co-Principal Investigator (PI) on NSF funded effort to build a citywide wireless sensor network. Co-wrote a proposal that was funded for \$900K by NSF. My responsibilities included: design and assembly of sensor node package, co-ordination with City of Cambridge for deployment, design and implementation of database schema and sensor data persistence application, characterizing wireless network performance (MySQL, Java).

#### **Network Management: US Army Future Combat Systems (2003 – 2009)**

Served as key technical contributor on original proposal to DoD to design and develop a network management system for the Army's Future Combat Systems (FCS-NMS) (funded for > \$12M). Specific responsibilities included: design and implementation of a device independent adaptation layer for network element management; championed and implemented test driven development model. (Java, JUnit, and ant).

### **Robot Team Control: DARPA Software for Distributed Robotics (2002 – 2003)**

Implemented a multi-modal interface that enabled an operator to direct and monitor a team of robots using voice commands with a PDA. This prototype used a distributed publish/subscribe whiteboard framework (Cougaar) to share data between wireless mesh network management and robot control subsystems (Player/Stage). (Java & C).

### **Speech and Language Processing (BBN Technologies: 1997 – 2002)**

#### **Spoken Language Call Routing: Verizon Call Director (1999 – 2002)**

Combined off-the-shelf speech recognizer with a novel statistical topic identification system to route callers who responded to an open-ended prompt. Submitted and was awarded two US patents. Developed regression and load testing using statistical traffic models. Managed system configuring and tuning throughout customer trials at a major telecom (Verizon Wireless): Data from trials projected an annual cost savings of \$4 million (Java, C++, MS-project).

#### **Multi-modal web-browsing on PDA with Pen and Speech: DARPA Advanced Logistics Program (1997)**

Developed a first of its kind multi-modal application that allowed the user to browse and order parts from a web-based catalog using a mixture of pointing and speaking on a handheld tablet PC (Java, HTML).

### **Network Products (BBN Technologies: 1995 – 1997)**

#### **Voice over IP Router: NEC Multi-Media Access Device**

Member of development team for first of its kind router for voice over packet switched (IP) network to customer in Japan (NEC). Specific tasks included: Ported a research prototype resource-reservation protocol implementation, ST-II (IPv5), to an embedded OS, maintained internal project web-site and customer interface for the shared source repository and configuration management (C, RCS).

### **Advanced Human-Computer Interfaces (MIT Media Lab: 1993 – 1995)**

#### **Human Motion Capture System:**

Created a body suit that captures the wearer's joint-angles, 36 degrees of freedom, including eye-gaze and makes them available to applications over the network in support of natural Human-Computer Interactions. Applications included controlling 3D CGI avatar, and a multimedia interactive documentary that inferred the interest of the viewer via their gaze (C++).

### **Selected Publications and Patents**

- M. Welsh and J. Bers, (2010). "CitySense: An Urban-Scale Sensor Network" In Ecological Urbanism, M. Mostafavi and G. Doherty Eds. - Harvard Graduate School of Design, (pp. 164-165)
- R. Murty et al. (2007) "CitySense: A Vision for an UrbanScale Wireless Networking Testbed" – HotNets '07. <http://www.cs.rochester.edu/~fahad/hotnets07-citysense.pdf>
- J. Bers et. al. (2006). "Systems and methods for providing audio information to service agents" US Patent 7,092,506.
- J. Bers, P. Peterson and J. Golden, (2005) "System and Method for Maximum Benefit Routing", US Patent 6,895,083.

- J. Bers and J. Redi, (2004). "Supporting Robot Teams with CougaarME over Wireless Ad-hoc Networks", in Proceedings of the 1st Open Cougaar Conference, July 20th, New York, NY.
- J. Redi & J. Bers, (2003). "Exploiting the interactions between robotic autonomy and networks." In A.C. Schultz, L.E. Parker, & F.E. Schneider (Eds.), *Multi-Robot Systems: from swarms to intelligent automata*, Volume II. (pp. 279 –289). Kluwer Academic.
- B. Suhm, J. Bers, D. McCarthy, B. Freeman, D. Getty, K. Godfrey, & P. Peterson, (2002). "A comparative study of speech in the call center: natural language call routing vs. touch-tone menus." *Proceedings of the CHI'02 Conference on Human Factors in Computing Systems*, (pp. 283 – 290). Minneapolis, April, ACM Press.
- S. Oviatt, P. Cohen, L. Wu, J. Vergo, L. Duncan, B. Suhm, J. Bers, T. Holzman, T. Winograd, J. Landay, J. Larson & D. Ferro, (2002). "Designing the User Interface for Multimodal Speech and Pen-Based Gesture Applications: State-of-the-Art Systems and Future Directions." In J.M. Carroll (Ed.), *Human-Computer Interaction in the New Millennium* (pp. 419 - 456). New York: ACM Press.
- J. Bers, S. Miller and J. Makhoul (1997), "Designing Conversational Interfaces for Mobile Networked Computing" in Proceedings of the Workshop on Perceptual User Interfaces, Banff, Canada, October 19-21. (pp. 61-64)
- J. Bers, (1996). A Body Model Server for Human Motion Capture and Representation. *Presence*, 5(4), (pp. 381-392). MIT Press.

## **Professional Activities / Honors & Other qualifications**

Senior Member of the Institute for Electrical Engineers (IEEE)

Served on a review panel for the National Science Foundation's directorate for Computers and Information Sciences and Engineering (NSF CISE)

Speak both Spanish and French fluently

Enjoy traveling, rowing and spending time with my children