John Nicholas Billings

Email john@monkeynut.org
Location Oakland, CA, USA

I am a lead software engineer with extensive experience developing back-end infrastructure.

Employment

04/13 – current **Yelp**, **Technical Lead, Service Infrastructure**

Technical lead for the team that develops the infrastructure for running all of the services that power Yelp.

- Deployed SmartStack distributed load balancing system and worked to migrate all services onto new system.
- Championed the use of Swagger schemas to create more robust service interfaces.
- Ongoing work to migrate job queuing onto Amazon SQS.

04/12 – 04/13 **Yelp**, **Technical Lead, Search Infrastructure**

02/11 – 04/12 **Yelp**, **Engineer, Search and Data Mining**

Individual contributor and technical lead for the team responsible for the Yelp search systems.

- Lead initial development of generic search system built using ElasticSearch.
- Rearchitected sharding model in Lucene-based search engine to dramatically reduce server footprint.
- Developed several high-performance REST services in Python and Java, including typeahead and search broker facilites.
- Extensive on-call experience supporting production systems.

05/10 – 02/11 **MyLife.com**, **Software Engineer**

Developed OCaml code for people-oriented search technology.

- Created distributed web page crawler in OCaml.
- Wrote Hadoop jobs in OCaml to analyze crawled data.
- Implemented Java code generator in OCaml.

10/09 – 05/10 **StarLeaf**, **Software Engineer**

For this start-up company, I was responsible for creating a high-performance media engine using C/C++ as part of a next-generation video-conferencing solution.

- Developed realtime, embedded audio and video processing code.
- Used Tilera multi-core processors for high scalability.
- Applied TCP/IP for co-ordinating distributed components.

Education

2005 – 2009 **PhD in Computer Science**
Computer Laboratory, University of Cambridge, UK

My PhD project involved extending and applying the theory of algebraic routing to the design of real-world Internet routing protocols.

- Created a compiler in OCaml for a declarative routing language
- Generalised the XORP routing platform for new routing protocols
- Developed an algebraic model of protocol inter-operation

2002 – 2005 **BA in Computer Science, First class with honours**
Queens' College, University of Cambridge, UK

During my undergraduate degree I obtained a broad foundation in computer science. My dissertation project involved creating a compiler for the Actue distributed programming lanauge, targetting the OCaml virtual machine.

Awards
Computer Laboratory award for outstanding final-year dissertation
Foundation Scholarship for obtaining first-class examination results
Queens' College prize for outstanding examination results

Talks and blog posts

2015 **Using Services to Break Down Monoliths** [blog]
Yelp Engineering blog post, subsequently covered on InfoQ news site

2014 **Building a Python Service Stack** [video]
Presentation at San Francisco Python Meetup Group

2013 **Using ElasticSearch to Scale Near Real-Time Search** [video, slides]
Yelp Engineering Open House Tech Talk

2007 **An architecture for metarouting** [slides]
Presentation at Routing in Next Generation Workshop, Madrid

Publications

2009 **Specifying and compiling Internet routing protocols** [paper]
John N. Billings
PhD dissertation

A model of Internet routing using semi-modules [paper, slides]
John N. Billings, Timothy G. Griffin
RelMiCS/AKA 11 2009

2006 **Type-Safe Distributed Programming for OCaml** [paper]
John Billings, Peter Sewell, Mark Shinwell, Rok Strniša
ACM SIGPLAN Workshop on ML

2005 **A Bytecode Compiler for Acute** [paper]
John Billings
Undergraduate dissertation