Zachary Hirsch, software engineer

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Experience

Google, Inc.   Ann Arbor, MI and Mountain View, CA
Staff software engineer   March 2010 to present

- Google Voice
  - Develop backend software for administration of Google Voice accounts.
  - Re-imagine phone number search to provide international and geolocation-based searches, in addition to existing features.
  - Implemented WebSockets RFC as a transport for SIP, and deployed to production as part of rollout of VoIP.
- Automatic, Google-wide capacity planning (patent 9,495,211)
  - Develop software that automatically analyzes and forecasts time series of user demand, describing how Google grows over time.
  - Tech lead for software that provides a common interface for retrieving time series information from numerous data sources spread across Google, and common operations (downsample, forecast, scale, etc) on those time series.
  - Tech lead for software that allows Google teams to describe the requirements for running their services in production (N+k redundancy within a region, latency between backends, etc), then uses these requirements and time series to generate capacity plans using linear and mixed integer programming.
- Site reliability engineering
  - On call for Google's content delivery network and YouTube's video serving infrastructure.
  - Develop features for the backend metadata serving and storage systems, e.g. strong consistency on top of eventually-consistent replicated Bigtables.
  - Work closely with other developers to deploy code seamlessly to production.
  - Created demand forecasts for the content delivery network, to determine where to increase capacity and build new points-of-presence at the edges of Google's network.
- MapReduce
  - Optimized the MapReduce framework to reduce wasted time before and after processing data. Dropped 99th percentile from 5 seconds to 200 milliseconds.
  - Implemented "memory chaining", allowing data to be passed from one MapReduce's reducer directly to another MapReduce's mapper through RAM, skipping disk entirely.
- C++, Python, Go, Java, MapReduce, Bigtable, Spanner, linear programming, and more.

VMware, Inc.   Palo Alto, CA
Senior member of technical staff   June 2006 to March 2010

- Build infrastructure team tech lead, focused on automation and maintainability.
  - Set goals and directed work for junior team members.
  - Set long-term technical direction for the build infrastructure team.
- Developed a highly scalable build harness for automated nightly builds, on-demand personal builds, and continuous integration builds.

- Developed a collection of web UIs, APIs, and command-line tools for accessing information about builds and build machines.
- Refactored makefiles to dramatically increase performance, e.g. reduced a two hour build to 25 minutes.
- Built cross-compilers and open source libraries used in VMware's products.
- Python, Perl, Make, Django, Perforce, PostgreSQL, and more.

Education

University of Michigan   Ann Arbor, MI
B.S.E. Computer Science   September 2003 to April 2007
- Magna cum laude, Dean's list, University Honors, Eta Kappa Nu

Private Pilot
- License issued August 22, 2016

References

Available upon request.