Zachary Hirsch, software engineer

5872 Stonecrop Dr NE, Belmont, MI 49306
908-420-9338
zhirsch@umich.edu

Experience

Google, Inc.   Mountain View, CA
Staff software engineer   March 2010 to present
- Automatic, Google-wide capacity planning (patent 9,495,211)
  - Develop software that automatically analyzes and forecasts time series of user demand, describing how Google services grow 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.
  - A large portion of Google's data center resources are planned using these tools.
- Site reliability engineering
  - Carry a pager for Google's content delivery network and YouTube's core 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 ensure that changes will seamlessly work in production.
  - Created demand forecasts for the content delivery network, used 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 the framework's wasted time before and after processing data. Reduced 99th percentile of this wasted time 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.
  - These helped enable low-latency applications to be developed on top of the mapreduce framework.
- Use C++, Python, Go, linear programming, MapReduce, Bigtable, other Google-specific technologies.

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, which performed 100s of nightly builds, 1000s of personal builds, and countless continuous integration builds each day.

- Developed a collection of web UIs, APIs, and command-line tools for accessing information about builds and build machines.
- Hacked on Makefiles to dramatically increase performance: reduced a two hour build to 25 minutes.
- Built cross-compilers and 3rd party (open source) libraries used in every build.
- Used Python, Perl, Make, Django, Perforce, PostgreSQL, etc.

Education

University of Michigan   Ann Arbor, MI
B.S.E. Computer Science   September 2003 to April 2007
- Graduated magna cum laude, member of Eta Kappa Nu honors society.
- Awarded Dean's List and University Honors five times.

References

Available upon request.