Sara Brockmueller

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Summary

Software engineer with 6+ years professional experience. Currently, most experienced with system design, building platforms/frameworks, and scaling systems (but always excited to learn new things!). Looking to work on hard problems, collaborate with smart and passionate people, and build important products.

Code priorities:	Shipping features quickly and confidently via readable/maintainable code, solid unit tests, and generic libraries to increase developer velocity.
Culture priorities:	Respect, transparency, social responsibility, curiosity, and using failure for growth.

Education

Massachusetts Institute of Technology, 2013 — B. S. Computer Science and Engineering, minor in Music

Skills

Languages/Frameworks:
Proficient in Java, Python, and gRPC. Significant experience in Ruby on Rails. Some prior experience in Django, Meteor, and MATLAB.

Databases:
DynamoDB, PostgreSQL, some experience in MongoDB.

Infrastructure:
Proficient with AWS services for compute (EC2, ECS, Batch, Lambda), storage (S3, DynamoDB), integration (SQS, SNS). Some experience with metrics/monitoring (Prometheus/Grafana, AWS CloudWatch), infrastructure as code (Terraform).

Architecture:
Distributed and concurrent systems, MapReduce, cloud-based services, microservices (both REST APIs and RPC), database design.

Experience

3Scan - Software Engineer — *Jan 2017 - Oct 2019*

- N-dimensional spatially-indexed database system and server, which handled 3+ petabytes of data.
  - Led feature development and maintenance for RPC-based data storage service, and the backing storage system on DynamoDB and S3. Built Java CLI tools for common data operations, improved useability of spatial abstractions for data indexing, made cost/performance optimizations, and managed deployments.
  - Managed team responsible for data storage and access. Led redesign of an automated data export process, which reduced developer time spent per tissue sample from several hours to ~30 minutes.
  - Created a tool to run efficient batch delete operations, ultimately saving >$20K per month in AWS bills.
  - Transformed thick data client into a gRPC service, which allowed users to run thin clients with no knowledge of the backing data structure, and permitted database migrations. Built corresponding fakes for testing, reducing test suite runtime from 10 minutes to 2 minutes.

  - Wrote a data processing service that allowed clients to run custom analysis on gigabytes of data in near-real-time, by distributing work across a pool of gRPC servers and randomizing data selection. Reduced client request times from several minutes to several seconds.
  - Built a wrapper around an undocumented API for a biological annotation service, so data could easily be submitted for annotation, and results could be retrieved and serialized for future use.

- Distributed data analysis for multi-terabyte biological imagery data sets.
  - Built Python prototype of distributed, event-driven data analysis system, Set up AWS infrastructure to run it (SQS, ECS, DynamoDB), handled AWS service limits, and onboarded analysis developers. Scaled the system to allow algorithms to be run on ~100x larger data sets.
  - Worked with algorithm developers to ensure analysis pipelines could be run on a distributed system: idempotent algorithms, deterministic serialization, and visible errors. Provided test libraries to encourage increased test coverage.

- Shared libraries and code quality.
  - Built and maintained a runtime assertion library used by the entire software team, which enforced runtime expectations for images and domain-specific data structures. This made error handling and logging consistent across the codebase, and made distributed system failures easier to debug.
  - Led development of serialization and test libraries, providing functionality specific to imagery and internal data structures.
  - Built tools for writing more robust AWS-based and gRPC-based services. Improved retry strategies, concurrency in network calls, and test reliability.
  - Initiated development of code quality and reliability standards. Worked with team to develop style guides, identify ways to reduce technical debt, standardize logging and metric collection, integrate static analysis tools, and improve test coverage and reliability. Mentored junior engineers during pair programming and code reviews.

LevelUp - Software Engineer *Jul 2013 - Jan 2017*

- Worked on the platform team to develop and maintain full-stack Ruby on Rails apps and RESTful API. These powered hundreds of mobile payments and loyalty apps in the food service industry, processing $20M from 600K users monthly. Improved scalability with async processing, caching, and moving to service-oriented architecture.
- Collaborated with a small team to architect and build a web service to enable order fulfillment through external online ordering provider. This included menu modeling and updating, suggesting orders, and integrating with provider APIs to process orders.
- Created dashboard for a sandbox server, to extend functionality for external developers using our API.

Internships

- **Infosys Labs** *(Jun 2012 - Aug 2012)* - Built web app for manual validation of semantic annotation databases.
- **South Dakota State University Bioinformatics Group** *(Jun 2011 - Dec 2011)* - Designed and implemented full-stack web app to visualize gene expression correlation networks, and collect gene expression data from users.
- **MIT Center for Brain and Computational Learning** *(Sep 2010 - Dec 2011)* - Designed and performed psychophysics and EEG experiments on the role of neural feedback mechanisms in human visual processing. Wrote MATLAB scripts for synthesis of image masks, running experiments, and data analysis.

- **MIT Center for Brain and Computational Learning** *(Jun 2010 - Aug 2010)* - Researched pancreatic cell proliferation in Type I diabetes, using cryoslicing, fluorescent staining, microscopy, and photo-editing software.

Interests

Hiking, cultivating plants/animals, sci-fi, making music, sewing, learning new skills and creating cool things.