CALEB CARLSON

SOFTWARE ENGINEER

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EDUCATION

M.S. in Computer Science
Colorado State University
GPA 4.00
2020 – 2022

B.S. in Computer Science
Colorado State University
Magna Cum Laude
GPA 3.98
2016 – 2020

SKILLS

Go, Python, Bash, C, C++, Java

Kubernetes, Helm, Docker

NoSQL and Keystores

REST API Frameworks

Version Control, CI/CD

Enterprise Project Management

Distributed Computing

Data Processing, Visualization

Test-driven Development

Object-oriented Design Patterns

Dynamic Programming

Summary

Ambitious and motivated Software Engineer with solid leadership and teamwork skills, with over 5 years' experience building robust solutions and scalable services in industry. Always eager to learn new methods and technologies while promoting sustainable development practices and minimizing technical debt. Passionate about open-source, community-driven projects and sharing creativity through contributing to public code spaces.

INDUSTRY EXPERIENCE

HPC STORAGE - SYSTEMS SOFTWARE ENGINEER II

Hewlett Packard Enterprise, Fort Collins, CO — *Jun 2022 – Present*

- Implemented a cluster fabric configuration API and address pool manager with accompanying CLI commands with Go
- Created an API-driven, parallel software upgrade process that can be scaled to thousands of nodes with Go and HPCM
- Designed and implemented cluster bootstrapping process for DAOS storage product, using HPCM as a foundation
- Triaged and repaired Kubernetes management issues in customers' legacy storage products
- Contributed bugfixes and LNet kernel module tuning improvements to community Lustre filesystem project
- Benchmarked HPC Lustre filesystems against GPUDirect Storage and POSIX clients
- Created Jenkins pipeline that builds, packages, and signs DKMS-enabled Lustre client RPMs for a variety of Linux distributions and kernel architectures
- Provided Helm charts, Makefile, and Kubernetes templates to the Lustre CSI driver, making it a usable out-of-box solution for the community
- Investigated Talos Linux as platform for new storage product and enabled InfiniBand device passthrough into pods
- Streamlined add-on data mover node discovery and software mapping process with Helm charts and Ansible playbooks

HPC STORAGE - SOFTWARE DEVELOPMENT INTERN

Cray, Inc., Longmont, CO — *May 2020 – May 2022*

- Automated Jenkins builds, Go unit testing, and Slack notifications for team's repositories
- Built Jenkins pipelines, Go unit tests, and Slack notifications for team's repositories
- Wrote tool to convert DMTF Redfish and SNIA Swordfish schema resource tree into Go models and primitives
- Improved gRPC communication strategy between data path microservices
- Automated Lustre filesystem provisioning based on discovered NVMe/SCSI drives
- Added redundant resource persistence via both filesystem and Kubernetes' etcd keystore

SOFTWARE DEVELOPMENT INTERN

Data Ductus, Inc, Longmont, CO — *May 2019 – Aug 2019*

- Implemented administrative RBAC for Verizon APIs
- Added audit log entries to API calls for user/action tracking
- Reduced end-to-end testing time from over 20 minutes to 6 minutes

ACADEMIA AND RESEARCH

Colorado State University, Fort Collins, CO

GRADUATE RESEARCH ASSISTANT

Jan 2020 – May 2022

- Published two papers to ACM and IEEE conferences, see *Projects*
- Automated management of 150+ node clusters with Kubernetes and Docker
- Established procedures for ingesting and sharding petabyte-sized datasets into MongoDB
- Built on-request data analytics services and contributed to open-source, NSF-funded Urban Sustain project
- Helped develop LSTM recurrent neural networks for point-cloud datasets generated from agricultural LIDAR equipment

TEACHING ASSISTANTSHIPS

Aug 2017 – Dec 2020

Operating Systems

- Taught recitations for over 70 students, publishing help videos and documentation for topics like thread safety, virtual memory, paging and swap space, sockets programming, kernel operations, storage access patterns, virtualization and containerization.
- Designed containerization-focused term project for the class with Kubernetes and Docker

Software Engineering

- Practiced Agile and Scrum master role, assisting teams with Sprint planning, automated DevOps
- Implemented and provided reference React/JSX web applet with RESTful API for students to test against
- Taught version control and Git project etiquette, clean code practices, REST API implementation with Java, and MySQL database creation/maintenance

Data Structures and Algorithms

- As lead TA, helped manage schedules and onboard new TAs
- Proctored exams and implemented automated grading/assignment submission system
- Facilitated learning inheritance, polymorphism, data structures, object-oriented design, recursion, and various algorithm implementations

PROJECTS

Omniscient	Distributed resource monitoring for memory pressure, CPU usage, storage I/O, Ethernet and InfiniBand throughput. [github.com/inf0rmatiker/omniscient]
Validation Service	Validates spatiotemporal models on large datasets in a distributed fashion and visualizes metrics as a geospatial heatmap. [github.com/Project-Sustain/validation-service]
Storm Topics	Detects most popular topics from live Twitter message streams using the lossy counting algorithm with Apache Storm and Zookeeper. [github.com/inf0rmatiker/stormtopics]
Docusum	Finds sentences that best summarize a Wikipedia document with Hadoop MapReduce. [github.com/inf0rmatiker/docusum]
Model Service	A service providing federated model training for spatially-segregated data. [github.com/inf0rmatiker/model-service]

PUBLICATIONS

ACM BDCAT 2021	*Distributed Orchestration of Regression Models Over Administrative Boundaries* [dl.acm.org/doi/10.1145/3492324.3494164]
IEEE ICCBE 2022	Resource Efficient Profiling of Spatial Variability in Performance of Regression Models [ieeexplore.ieee.org/abstract/document/10020602]

References upon request.