

Paul Norman

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Objective

Flexible part-to-full-time employment making use of my extensive background in open data, open source, and geospatial software development.

Skills

- Deep expertise in:
 - PostgreSQL, PostGIS, Python, Bash
 - OpenStreetMap tagging, community practices, and how to guide participants in community projects
 - REST API design and HTTP best practices
 - AWS, Fastly, GitHub, Prometheus
 - GDAL, GEOS, osm2pgsql, Imposm, osmium, Mapnik
- Experience as a maintainer for open-source projects, as well as growing these projects
- Delivery of clear and focused presentations to technically oriented audiences, industry groups, and executives
- Strong written and oral technical communication skills

Work History

Software Development Engineer II – Amazon Web Services, Vancouver

Sept. 2021 – Sept. 2022

- Served as on-call for highly available systems with tight SLAs, including managing alerting and tracing errors
- Planned and reviewed architecture designs for a microservice-based tile generation system using AWS Aurora, Lambda, Step Functions, CloudFormation and S3 to reduce costs and have ownership of the product and quality
- Developed monitoring for map delivery to ensure SLAs were met and to detect service problems before they became critical
- Reviewed and wrote weekly service operation reports discussing anomalies, outages, metrics and service health

Software Development Engineer II – Amazon Logistics, Seattle

Mar. 2019 – Sept. 2021

- Maintained a legacy Spark-based tile generation system
- Designed and implemented a cloud-based scalable, fault-tolerant map generation pipeline using AWS Batch, Step Functions, Lambda, S3, CloudFormation, DyanamoDB and RDS that reliably served maps to hundreds of thousands of drivers
- Provided subject matter expertise on converting Zenren data to OpenStreetMap formats
- Trained fellow developers in vector tile use and internals
- Built and ran docker-based containers using AWS ECS
- Designed, built and maintained CI/CD pipelines to deploy changes to multiple environments in different regions
- Conducted service reviews with security teams to maintain best practices

OpenStreetMap Developer – Volunteer

2011 – present

- Operated an on-demand tile service serving tens of thousands of requests worldwide
- Budgeted for operational and infrastructure spending
- Managed release engineering for multiple projects with cross-dependencies and users with varying upgrade needs
- Designed, built and maintained CI/CD workflows in GitHub Actions and Travis
- Served on the OSMF board for six years

Technical Cartographer – Wikimedia Foundation, Vancouver (remote)

Nov. 2016 – July 2018

- Independently wrote a new vector tile CartoCSS stylesheet to serve the needs of varying map users
- Deployed NodeJS software to production using Puppet

Software Developer – CartoDB, Vancouver (remote)

Dec. 2015 – May 2016

- Modernized CartoDB basemap infrastructure
- Expanded PostGIS functionality
- Optimized vector tile generation and code others had written
- Processed and re-packaged open data for analysts to use
- Used PostgreSQL, PostGIS, C, C++, Bash, Unix environments, cloud compute systems, Git, and GitHub

Software Developer – MapQuest, Vancouver (remote)

Jun. 2014 – May 2015

- Wrote a new vector-based stylesheet
- Rewrote PostgreSQL data conversions to be faster and less error-prone
- Presented internally on new PostgreSQL and PostGIS features
- Extended C++ programs to add new functionality
- Participated in code reviews
- Liaised with open source community to integrate new code upstream
- Used PostgreSQL, PostGIS, C++, Python, cloud compute systems, Unix environments, Git, and GitHub

Early employment

- Consultant – AOL, Vancouver (remote)
- Co-op Student Coder – Google Summer of Code, Vancouver (remote)
- Engineering Co-op Student – WorkSafeBC, Richmond

Conference Presentations

- Modern osm2pgsql tricks – November 2023
- osm2pgsql flex backend – June 2023
- OpenStreetMap Standard Layer: Who uses it? – July 2021
- Corporate Cartography: How the sausage gets made – July 2018
- OpenStreetMap Carto: All about osm.org's default style – August 2017
- Overview of Vector Tiles – October 2017
- Rendering Your Own Maps Workshop – July and September 2016
- osm2pgsql/mapnik: Optimizing the Rendering toolchain – April 2014

Education

University of British Columbia

Bachelor of Applied Science, Engineering Physics, 2013