Bharat KUNWAR

Software Engineer

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- I am an experienced problem solver in a cross section of technical domains and open to solving problems that people and business entities are facing using state-of-the-art techniques.
- At Two, I am fixing B2B payments with focus on infrastructure and merchant integrations.
- At StackHPC, I supported customers with Kubernetes and OpenStack enabled High Performance cloud computing environments.
- At Airbus, I trained a deep reinforcement learning algorithm to learn best rules of interaction when a fleet of connected autonomous vehicles engage with other vehicles on a road network in a simulation.
- During my doctoral training, I built a large scale agent-based simulation environment to measure city evacuation time and compared topological features derived from OpenStreetMap with evacuation time to determine attributes that make some cities easier to evacuate than others.

Professional Experience

Present | **Senior Software Engineer, Two, Remote**

Jan 2024 – Sep 2021 | **Software Engineer, Two, Remote**

- Developing REST API for backend services based on Python Flask/FastAPI framework and Golang.
- Developing frontend application on Svelte/Javascript based web frameworks.
- Containerising and deploying microservices to Kubernetes hosted on Google Kubernetes Engine.
- Defining infrastructure as code in Terraform, Ansible and Helm.
- Building CI/CD pipeline based on Github Actions.
- Monitoring and alerting using Prometheus and Grafana.
- Mentoring and coaching junior engineers.

Python | Flask | FastAPI | Svelte | Javascript | PostgreSQL | Kubernetes | GCP | Terraform | Helm

Aug 2021 – Feb 2018 | **Software Engineer, StackHPC, Bristol**

- Core contributor to Magnum, an OpenStack project for managing the lifecycle of Kubernetes clusters.
- Adding features to Magnum controller and API microservices to support cluster CRUD operations.
- Automating management of High Performance OpenStack cloud for various research organisations.

Python | Kubernetes | OpenStack | Ansible | Terraform | Prometheus | Grafana

Mar 2017 – Jun 2016 | **Research Engineer, Airbus Group Innovations, Newport**

- Integrating Keras and OpenAI Gym with Aimsun (a traffic simulation software).
- Training a reinforce learning model to drive Connected Autonomous Vehicles (CAVs) driving agents with an aim to improve global traffic conditions.
- Working as part of a multi-sector collaboration called FLOURISH that helped to advance the implementation of CAVs in the UK.

Python | Tensorflow | Keras | OpenAI Gym

Dec 2013 – Aug 2012 | **Placement Candidate and Manager , Shelter Associates, Pune, India**

Engineers Without Borders, Volunteer

- Co-developed a web application to automate slum data gathering, analysis and mapping with an aim to raise awareness of the standard of living of slum residents.
- Recruited additional volunteers to develop a mobile app to streamline data collection.

Python | Django | PostgreSQL+PostGIS | OpenStreetMap

Technical Exposure

Languages	Python, Javascript, Bash, Golang, MATLAB, C++
Frameworks	Python (Flask, FastAPI, Django), Javascript (Svelte, React), Leaflet.js, HTML, CSS
Cloud Providers	Google Cloud Platform, OpenStack, Amazon Web Services, Microsoft Azure
Telemetry	Prometheus, Grafana, Google Cloud Monitoring, ElasticSearch, Kibana
Database	PostgreSQL (with PostGIS), MariaDB/MySQL, InfluxDB, PromQL, MongoDB
Infrastructure	Kubernetes, Helm, Docker, Terraform, Ansible, Kata Containers, CephFS, BeeGFS, GlusterFS
Analytics	Scipy, Numpy, NetworkX, Pandas, FastAI, PyTorch, Keras, Tensorflow, OpenAI Gym, Shapely
Workflow	Git, SVN, Vim, VS Code, LaTeX
Operating Systems	Linux, MacOS, Windows

Education

2017 **University of Bristol**
PhD in Systems Engineering (Mass Evacuation and Crisis Readiness of Cities using Open Geo-spatial Data and Agent-based Modelling).
- Built a large scale agent-based simulation framework to measure city evacuation time and mine features from OpenStreetMap and open population datasets that make cities evacuation friendly.
- Made some of the findings accessible to the public (https://massevac.github.io) to visually communicate how the cities across the UK rank in terms of evacuation time estimate (greener is better).
- Published several publications on peer-reviewed journals and proceedings and had opportunities to present work at various academic conferences.

2012 **University of Bath**
MEng (2:1) in Civil and Architectural Engineering.
- Represented my cohort in the final year.
- Organised workshops for Engineers Without Borders, Visual Arts and People and Planet student societies as an active committee member.

2008 **Harvey Grammar School**
A-level in Mathematics, Art, Computing, Chemistry (A).
- Recipient of a second prize for Folkestone Young Artist Award.

2005 **Carr Hill High School**
GCSE in Science, Mathematics, ICT, Art (A), English, Graphics Design, P.E. (B).
- Involved in setting up a website to sell mobile ring tones through the Young Enterprise scheme.

Interests

- I enjoy spending my time outdoors, being creative with food, various forms of art, craft and photography.
- I enjoy attending meetups and hackathons to get to know people who share my love of learning new things.
- I value playing an active role in my community and have been a member of various local groups.

Spoken Languages

English ●●●●●
Nepalese ●●●●○
Hindi ●●●○○

Soft Skills

- Comfortable in positions of responsibility
- Analytical and creatively minded problem solver
- Confident speaker who equally values listening
- Inclusive team member who thrives in diverse teams