## Bharat **Kunwar** Software Engineer

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- > I am an experienced problem solver in a cross section of technical domains and open to opportunities to collaborate on projects to solve real world problems that people and business entities are facing using state-of-the-art techniques.
- > At StackHPC, I supported Kubernetes and OpenStack enabled High Performance cloud computing environments.
- > At Airbus, I trained a deep reinforcement learning algorithm to learn globally optimal rules of interaction when a fleet of connected autonomous vehicles engage with other vehicles on a road network in a multi-agent micro-simulation environment.
- > During my doctoral training, I built a large scale agent-based simulation environment to measure city evacuation time and mine topological features from OpenStreetMap and subsequently compared the two metrics to determine factors that make some cities easier to evacuate than others.

# TECHNICAL COMPETENCIES

Languages Python, Matlab, Golang, C++, Bash, Javascript, Solidity

Scipy, Numpy, NetworkX, Pandas, FastAI, PyTorch, Keras, Tensorflow, OpenAI Gym, Shapely Infrastructure Kubernetes, Helm, Docker, Kata Containers, Ansible, Terraform, CephFS, BeeGFS, GlusterFS

Workflow Git, SVN, Vim, VS Code, ŁTFX

Database PostgreSQL+PostGIS, MariaDB/MySQL, InfluxDB, PromQL, MongoDB **Cloud Providers** OpenStack, Google Cloud Platform, Amazon Web Services, Microsoft Azure Web Frameworks Python (Django, Flask, Jinja), Javascript (React), Leaflet.js, HTML, CSS

**Operating Systems** Linux, MacOS



### PROFESSIONAL EXPERIENCE

## Present

## Software Engineer, Two, Remote

Sep 2021

- > Adding features two backend and frontend.
- Infrastructure as code and building CI/CD pipeline.
- > Operating Kubernetes clusters on Google Cloud Platform.
- > Monitoring and alerting using Prometheus, Grafana.

Kubernetes | Google Cloud Platform | Prometheus | Grafana | Terraform | Ansible | Python | Flask | FastAPI | SvelteKit TypeScript Postgres Golang

#### Aug 2021

#### Software Engineer, STACKHPC, Bristol

Feb 2018

- > Core contributor to Magnum, an OpenStack project for managing the lifecycle of Kubernetes clusters.
- > Automating management of High Performance OpenStack cloud for various organisations.

Kubernetes OpenStack Ansible Terraform Python

#### Mar 2017 Jun 2016

#### Research Engineer, AIRBUS GROUP INNOVATIONS, Newport

- > Integrating Keras and OpenAl 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.

Tensorflow | Keras | OpenAl Gym | Python

# Jun 2016

#### Teaching Assistant, UNIVERSITY OF BRISTOL, Bristol

Dec 2013

- > Co-supervised undergraduates with my thesis advisor for their dissertation projects.
- > Assisted undergraduates in mathematics and programming tutorials.
- > Supported undergraduates with special needs during lectures and exams.

MATLAB C++ Java Python

## 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



#### 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.
- > Lenjoy 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



# + 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