

# 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

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|--------------------------|--|
| <b>Languages</b>         | Python, Matlab, Golang, C++, Bash, Javascript, Solidity                                  |
| <b>Data</b>              | Scipy, Numpy, NetworkX, Pandas, FastAI, PyTorch, Keras, Tensorflow, OpenAI Gym, Shapely  |
| <b>Infrastructure</b>    | Kubernetes, Helm, Docker, Kata Containers, Ansible, Terraform, CephFS, BeeGFS, GlusterFS |
| <b>Workflow</b>          | Git, SVN, Vim, VS Code, $\LaTeX$   |
| <b>Database</b>          | PostgreSQL+PostGIS, MariaDB/MySQL, InfluxDB, PromQL, MongoDB                             |
| <b>Cloud Providers</b>   | OpenStack, Google Cloud Platform, Amazon Web Services, Microsoft Azure                   |
| <b>Web Frameworks</b>    | Python (Django, Flask, Jinja), Javascript (React), Leaflet.js, HTML, CSS                 |
| <b>Operating Systems</b> | Linux, MacOS   |

## 📁 PROFESSIONAL EXPERIENCE

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|----------------------|--|
| Aug 2021<br>Feb 2018 | <b>Software Engineer, STACKHPC, Bristol</b> <ul style="list-style-type: none"><li>&gt; Core contributor to Magnum, an OpenStack project for managing the lifecycle of Kubernetes clusters.</li><li>&gt; Automating management of High Performance OpenStack cloud for various organisations.</li></ul> <p>Kubernetes   OpenStack   Ansible   Terraform   Python</p>  |
| Mar 2017<br>Jun 2016 | <b>Research Engineer, AIRBUS GROUP INNOVATIONS, Newport</b> <ul style="list-style-type: none"><li>&gt; Integrated Keras and OpenAI Gym with Aimsun (a traffic simulation software) to train neural network based Connected Autonomous Vehicle driving agents in parallel with an aim to improve global traffic conditions using reinforcement learning as part of a project called FLOURISH.</li></ul> <p>Tensorflow   Keras   OpenAI Gym   Python</p>   |
| Jun 2016<br>Dec 2013 | <b>Teaching Assistant, UNIVERSITY OF BRISTOL, Bristol</b> <ul style="list-style-type: none"><li>&gt; Co-supervised undergraduates with my thesis advisor for their dissertation projects.</li><li>&gt; Assisted undergraduates in mathematics and programming tutorials.</li><li>&gt; Supported undergraduates with special needs during lectures and exams.</li></ul> <p>MATLAB   C++   Java   Python</p>   |
| Dec 2013<br>Aug 2012 | <b>Placement Candidate and Manager, SHELTER ASSOCIATES, Pune, India</b><br><i>Engineers Without Borders, VOLUNTEER</i> <ul style="list-style-type: none"><li>&gt; 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.</li><li>&gt; Recruited additional volunteers to develop a mobile app to streamline data collection.</li></ul> <p>Python   Django   PostgreSQL+PostGIS   OpenStreetMap</p> |

## EDUCATION

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- 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

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- > 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

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

## SOFT SKILLS

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- > 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