Prakhar **Verma**

Researcher · Machine Learning, Data Science, and Artificial Intelligence · Aalto University

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Summary

Experienced machine learning scientist with 4+ years working with the R&D department of a multi-national company, a start-up, a public sector company, and an NGO. I aim to utilize my knowledge and experience in building probabilistic, explainable machine learning models eventually leading to robust models.

Professional Experience

Aalto University — *Espoo, Finland*

Research Assistant **(AaltoML Group)** — *April 2020 - Present*

- **Sparse State Inference in Latent Models**
  Researching on a sparse inference method for latent space and state-space models utilizing variational approximation and doubly sparse Gaussian processes.
- **Scalable Inference in Stochastic Differential Equations**
  Researched and developed a probabilistic machine learning model to learn latent dynamics of a system using Gaussian process along with a scalable inference scheme by approximating Fokker-Planck-Kolmogorov equation.

Teaching Assistant — *Spring 2020, Spring 2021*

- **Deep Learning (CS-E4890)**
  One of the teaching assignments responsibile for assignments creation and supervision along with the professor.

TomTom — *Pune, India*

Software Engineer(R&D) — *July 2016 - August 2019*

- **Automatic Feature Extraction from Satellite Imagery**
  Researched and developed a semantic segmentation solution for extracting map features from satellite imagery and directly ingesting them into the database removing human-in-the-loop.
- **Raah: Real-time Map**
  Successfully developed the POC for a real-time map vector tile server which later converted into an open platform product.
- **On-field map reporting surveying tool**
  Developed an ArcGIS plugin used daily by the surveyors across the globe for field surveying and reporting.

Education

Aalto University — *Finland*

Master of Science (M.Sc.) — *2019 - Present*

- Major in Machine Learning, Data Science, and Artificial Intelligence
- Minor in Mathematics
- 4.7/5

Uttarakhand Technical University — *India*

Bachelor of Technology (B.Tech.) — *2012 - 2016*

- Specialization in Information Technology
- 79.03% (First Division with Honors)

Skills & Interests

- Probabilistic Machine Learning, Gaussian Processes, Bayesian Learning, Uncertainity quantification, Deep Learning, Optimization
- Python, PyTorch, GPFlow, NumPy, Scikit-learn, OpenCV, JAX, AWS.

Publications

- Arno Solin, Ella Tamir, **Prakhar Verma**. Scalable Inference in SDEs by Direct Matching of the Fokker-Planck-Kolmogorov Equation. Under review in *38th International Conference on Machine Learning* (ICML), 2021.
- Fuzail Palnak^{+}, Kshitij Nikhal^{+}, **Prakhar Verma**$^{+}$, Ravi Panchani^{+}, and Sagar Rohankar^{+}. "M.A.G.E.C: machine assisted geometry extraction and creation". *Twelfth International Conference on Machine Vision* (ICMV 2019).

Presentations

- Tensorflow case study on how convolution neural networks can be used to extract road networks and airports from satellite imagery and how TFServing can be used to host the models at Google Developers Group 2018
- An end-to-end machine learning framework to detect and extract essential map features from satellite imagery and ingest into the database without human-in-the-loop at GeoSpatial World Forum 2018

Accomplishments

- Awarded *"Dean Scholarship 2020"* at Aalto University.
- Awarded *"Face of TomTom 2018"* for actively representing TomTom in conferences and promoting the brand.
- Winner of TomTom *"Innovation Day 2018"*, presented an artificial intelligence plugin which bridges the gap between machines and cartographers.
- Mentor at "TomTom External Hackathon 2018".
- *"Electronic Health Record"* idea was selected in Top 10 at a national event, "India Ideathon 2015".

Projects

Spectral Graph Analysis

Aalto University *November 2019*

The project aims to perform graph partitioning with the use of Spectral Clustering on social network graphs. The goal is to minimize the number of cuts while maintaining cluster size balance.
More Details : Github Repository

Bayesian Statistics Global Warming

Aalto University *November 2019*

The goal of the project was to examine how much the sea level rise would affect the coastal cities of Finland.
More details : Github Repository

Speaker Adaptation

Aalto University *November 2019*

In this project, we present the various speaker adaptation techniques based on recently developed training methods and their respective results by performance levels (word error rate percentage).
More details : Research Paper

More Projects

Github

https://github.com/prakharverma