Vaibhav **Kulkarni**

PhD-Information Systems · Software Engineer (Data Engineering | ML | Information Privacy)

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Work Experience

SOPHiA GENETICS   *Lausanne, Switzerland*

Senior Data Engineer   *April 2021 - Present*

GenLots SA   *Lausanne, Switzerland*

Software Engineer | Research & Development Lead   *Sept. 2019 - Mar. 2021*

- Backend & Frontend development (Python, React), infrastructure (app security) & ETL pipeline design & implementation
- Algorithmic development & optimization, foreign language interfaces(C/C++ bindings), Reinforcement Learning
- Production grade Machine Learning & Time Series Forecasting (data science, statistical learning, signal processing)

Distributed Object Programming Lab (HEC-Lausanne)   *Lausanne, Switzerland*

Research Scientist   *Nov. 2015 - Aug. 2019*

- Managed & directed partnership with Transports publics Lausannois, provided analysis & recommendations to curb ticket-free riding
- Led 3 large-scale data collection campaigns, generated 700,00 CHF+ in project funding, recruited 100+ project participants & assistants
- Initiated & supervised collaborations with AI labs located at Columbia University, New York & Dublin Institute of Technology, Ireland

CloudCeption   *Berlin, Germany*

Co-founder & Systems Architect   *Jan. 2014 - Aug. 2015*

- Developed & implemented a comprehensive cloud infrastructure for testing Internet of Things products
- Deployed prototypes at ETH Zürich & TU Berlin, conducted large-scale surveys, captured performance metrics

BOLT IoT   *Goa, India*

Embedded Systems Engineer   *Aug. 2011 - Aug. 2013*

- Conceptualized, designed & developed prototypes of the Robotics & IoT embedded platforms
- Led the customer support & troubleshoot team, trained 1000+ professionals, assisted talent hiring

Education

HEC-Lausanne (University of Lausanne)   *Lausanne, Switzerland*

PhD, Information Systems/Computer Science   *Nov. 2015 - Aug. 2019*

- Thesis: Modeling, Predicting & Capturing Human Mobility
- Research Areas: Machine Learning, Data Privacy, Geographic Information Systems, Statistics
- Certifications: Machine Learning, Information Security, Cloud Services, Privacy Regulations

Technische Universiteit Eindhoven   *Eindhoven, Netherlands*

MS, Electrical Engineering (Graduated with Cum Laude)   *Aug. 2014- Aug. 2015*

- Specialization in Computer Architectures & System Infrastructure
- Master thesis at **ETH Zürich**: Facilitating Wireless Coexistence Research

Technische Universität Berlin   *Berlin, Germany*

MS, Information & Communication Technology (Graduated with Honors)   *Feb. 2013- Aug. 2014*

- Completed a Minor degree in Innovation, Business & Entrepreneurship (Thesis: IoT product Business Plan)
- Specialization: Internet of Things, Wireless Network Architectures & Infrastructures

Goa College of Engineering (Goa University)   *Goa, India*

BS, Electronics & Communication Engineering (Graduated with Honors)   *Jun. 2008- May. 2012*

- Specialization: Robotics & Internet of Things
- Thesis: Multi-Mobile Robot Communication System - Received 20+ national awards, Applied Materials honorary award

Skills

- Programming, Scripting, Databases (Python, JavaScript, C/C++, Bash, SQL, Matlab, regex) • Data Science Stack (NumPy, SciPy, Pandas)
- Applied Machine Learning/Statistical Learning (Scikit-learn, Tensorflow, Keras, R) • Data visualization (Tableau, matplotlib, D3, deck.gl)
- Big Data Analysis (Apache Spark, Spark Streaming, Kafka, ETL pipelines) • Amazon Web Services • Google Cloud Platform
- Microservices with Docker, Flask, React & RabbitMQ, Kubernetes, Elasticsearch, Kibana • Version control tools (GIT, SVN), CI/CD pipelines

- Project management, Agile/Scrum frameworks • Atlassian suite, Jira, Trello • Rapid prototyping, Design thinking • Data management
- Languages: English (Fluent), French (B1), German (A2), Hindi (Fluent), Marathi & Konkani (Native)

Project Management Experience

Collaborator: TL – Transports publics Lausannois
Lausanne, Switzerland

PROJECT: CURTAIL TICKET-FREE RIDING ON LAUSANNE PUBLIC TRANSPORT NETWORK
Aug. 2017 - Aug. 2018

- Analyzed openly available data, studied & pitched the problem & solution of ticket-free riding to TL operations & data-management team
- Assembled a team of data managers, engineers, statisticians, public transport controllers & led data extraction, cleaning and analysis
- Designed, supervised & delivered the implementation of an ML based solution to dispatch controllers to optimized stops to perform checks

Collaborator: Hublot, Rehau
Switzerland

GENLOTS PROJECT: FORECASTING INTERNAL RAW-MATERIAL DEMAND FOR SUPPLY CHAIN OPTIMIZATION
Dec. 2019 - Mar. 2021

- Performed preliminary analysis to devicce KPIs & highlight the need of additional data elements to respective data-science teams
- Collaborated with Hublot/Rehau data-management teams & EPFL chair of statistics to design, implement and recommend a potential solution

Collaborator: University of Lausanne, EPFL
Switzerland

PROJECT: ANALYSIS & INSIGHTS COLLECTION FROM EXCHANGE STUDENT MOBILITY PROFILES
Dec. 2016 - Sept. 2017

- Drafted a data collection and analysis proposal to understand and improve educational & social life of exchange students
- Recruited project participants, assembled a team to develop a mobile application to track participants (anonymized & encrypted)
- Analyzed the collected dataset, performed modeling & submitted recommendations to the university exchange offices

Selected Publications (Projects Led with International Research Labs)

- Generative Models for Simulating Mobility Trajectories
  V. Kulkarni, N. Tagasovska, T. Vatter, B. Garbinato (collaboration with Statistics group at Columbia University)
  Impact: Advanced synthetic mobility-data generation for autonomous driving, urban planning & traffic prediction
  Neural Information Processing Systems (top-tier machine learning conference), Montreal Canada (Dec. 2018)

- Mobility modeling on smartphones to achieve privacy by design
  V. Kulkarni, A. Moro, B. Chapuis, B. Garbinato
  Impact: Facilitated federated learning by enabling computation on geolocation data on smartphones
  IEEE Conference on Trust, Security and Privacy (IEEE flagship security conference), New York USA (Aug. 2018)

- Breadcrumbs: A Rich Mobility Dataset with Point-of-Interest Annotations
  A. Moro, V. Kulkarni, PA Ghiringhelli, B. Chapuis, K. Huguenin, B. Garbinato (collaboration with Information Security Lab)
  Impact: Gathered a large scale geospatial dataset that will facilitate GIS & location privacy research
  Conference on Geographic Information Systems (top tier GIS conference), Chicago USA (Nov. 2019)

- Information Disclosure in Location-based Services: An Extended Privacy Calculus Model
  D. Naous, V. Kulkarni, C. Legner, B. Garbinato (collaboration with BISA Lab)
  Impact: Aided mobile application developers to integrate user information disclosure behaviors in application design
  International Conference on Information Systems (Premier Information Systems Conference), Munich Germany (Dec. 2019)

- Extracting Hotspots without A-priori by Enabling Signal Processing over Geospatial Data
  V. Kulkarni, A. Moro, B. Chapuis, B. Garbinato
  Impact: Advanced the benchmark on gathering mobility insights from large-scale geolocation datasets
  Conference on Geographic Information Systems (top tier GIS conference), Los Angeles USA (Nov. 2017)

- Privacy-Preserving Location-Based Services by using Intel SGX
  V. Kulkarni, B. Chapuis, B. Garbinato
  Impact: Designed & implemented secure service architecture offering high service utility while preserving privacy
  Conference on Embedded Networked Sensor Systems (top tier IoT conference), Delft Netherlands (Nov. 2017)

Extracurricular Activities

- Initiated technology drive to develop interest in tech in rural Indian students: Visited 25 schools to present & demonstrate robotic applications
- Running: Lausanne marathon (2018, 2019), Neuchâtel semi-marathon(2018), 20KM de Lausanne ('16, '17, '18, '19), Ultimate frisbee (Lausanne)