

# Shashwat Dalal

## MACHINE LEARNING ENGINEER SPECIALISING IN LARGE-SCALE OPTIMIZATION

shashdalal@gmail.com

linkedin.com/in/shashwat-dalal

shashwatdalal.github.io

## WORK EXPERIENCE

**QUANTUMBLACK (A MCKINSEY COMPANY)** | JUNIOR PRINCIPAL MACHINE LEARNING ENGINEER  
September 2020 – Current | London, United Kingdom

### Tech Lead for Intelligent Digital Twin Service Line:

Co-founded a team that serves clients at the intersection of digital twins and advance analytics.

- Develop and deployed ML solutions for **10+ clients** across **energy, engineering, logistics, and life sciences**.
- Grew the team to **7 technical practitioners**.
- Defined a **technology strategy** to develop an **ecosystem of assets** that enabled clients to leverage unprecedented compute power, **unlocking new capabilities** and **improving client delivery**.

### Highlighted Projects:

#### Hydro-Electric Turbine Design Optimisation:

- Developed and scaled a design optimisation process for a turbine OCM, using **genetic and Bayesian methods** on a compute cluster using Ray.
- Improved turbine efficiency by **+0.4%** (power to supply approximately **3,000 more homes** per year, for a typical dam), **95% faster** at **50% less compute cost** compared to previous methods.

#### Scaling Digital Protein Design:

- Led the migration of a in-silico protein engineering asset to an elastic **GPU cluster** using **Ray** and **Kubernetes**, reducing costs and boosting throughput for clients.
- Achieved a **57x speedup** in protein folding and a **37x speedup** in molecular embedding through scaling and improving **GPU** utilisation, whilst reducing costs by **30-60%**.

#### Bidding Agent for Battery Energy Storage System:

- Led a **team of 5** to develop a **reinforcement learning-based** bidding agent for a battery energy storage system, overseeing technical deliverables, system architecture, and project management.
- The agent outperformed the existing receding horizon linear program solution by **34%** in returns when tested against a simulated benchmark.

#### Supply Chain Optimisation:

- Supported a **team of 6** to design and develop a **mixed-integer linear optimisation model** for a global computer manufacturer, unifying production and capacity planning across regions.
- Integrating the model with internal data platforms, enabling a centralised decision-making service based on real-time forecasts, backlog management, and manufacturing constraints.

## BLOOMBERG | SOFTWARE ENGINEERING (INDUSTRIAL PLACEMENT)

April 2019 – September 2019 | London, United Kingdom

- **BuildStream Docker Plugin:** (*Report, Code*)  
Prototyped a plugin that enabled users of BuildStream, an open-source software build system, to seamlessly migrate to containerization platforms, optimising image creation, reducing rebuilds, and preserving existing workflows.

## EDUCATION

### IMPERIAL COLLEGE LONDON | COMPUTING MENG. (GRADUATED 1ST CLASS)

October 2016 – June 2020 | London, United Kingdom

- **Effect of Non-Identically Distributed Data on Federated Learning for Next-Word Prediction** (*Report, Slides*)
- **Aspect-based Sentiment Analysis with Goldman Sachs:** (*Report, Code*)  
In a team of six, built an aspect-based sentiment analysis engine for the asset management engineering team. Back-end written in **Python** and database layer used **MySQL**, and **Microsoft Cosmos**.

## SKILL-SET SUMMARIZED

### TECHNICAL-SKILLS

Python • Machine Learning (PyTorch, TensorFlow, GPUs, Federated Learning) • Distributed Systems (Ray, Kubernetes, Docker) • Optimisation Algorithms (Linear, Genetic, Bayesian, Reinforcement Learning) • AWS • GCP • NLP • Java •  $\LaTeX$

### SPOKEN-LANGUAGES

English (Written/Spoken Fluency) • Gujarati (Spoken Fluency) • Japanese (Written/Spoken Conversational) • Spanish (Written/Spoken Conversational) • Hindi (Spoken Conversational)