Roshan Mahes

Email | LinkedIn | Google Scholar | GitHub
Amsterdam, Netherlands | +31 6 51902912

Data Scientist with a degree in Mathematics & Operations Research and 5 years of experience driving product and operational decisions using large-scale behavioral and event data. Strong background in exploratory data analysis, statistical modeling, experimentation, causal inference, and real-time analytics. Hands-on experience with dashboards and scalable data pipelines. Comfortable partnering with product managers, engineers, and leadership to turn ambiguous questions into actionable insights. EU work authorization.

Working Experience

Hypermonitor — **https://hypermonitor.org** Amsterdam, Netherlands
Co-Founder & Data Scientist *Sep 2025 – Present*

- Co-founded Hypermonitor, a real-time analytics platform for the Hyperliquid decentralized exchange, providing transparency into **on-chain trading behavior, risk exposure, and execution quality**.
- Built and operated low-latency **data pipelines** (SDKs, APIs, WebSockets) to process high-frequency blockchain events and rank **159K+ on-chain addresses**.
- Developed quantitative metrics and interactive dashboards for real-time **risk monitoring, behavioral analysis, and anomaly detection**.

De Rechtspraak Utrecht, Netherlands
Data Scientist *Mar 2024 – Present*

- Developing capacity planning and inflow prediction models to support resource allocation across courts, using statistical forecasting and optimization techniques.
- Designing interventions to reduce juvenile case lead times by identifying bottlenecks and modeling workload.

PostNL The Hague, Netherlands
Data Scientist *Mar 2021 – Mar 2024*

- Developed and deployed time-window prediction models in AWS (Lambda, S3) and monitoring dashboards, improving time-window accuracy by **+0.3%** to over **93%** and increasing correct-delivery rates by **+0.9%**.
- Designed and evaluated real-time time-window updates for last-mile delivery, informing **millions of customers annually** and reducing failed deliveries, leading to estimated savings of **more than €700K per year**.
- Collaborated closely and independently with product managers, engineers, and business stakeholders to translate business problems to data stories and analytical insights into deployed solutions with measurable KPIs.

University of Amsterdam & Vrije Universiteit Amsterdam Amsterdam, Netherlands
Lecturer & Course Developer *Jun 2018 – Oct 2024*

- Taught Python, Mathematics, Business Analytics, Business Administration, and Accountancy courses. Relevant courses: **Statistical Data Analysis**, **Statistical Models**, Programming, Business Operations and Processes.
- Provided guidance in Python development for the Mathematics programme, e.g. by creating and teaching the course *Python for Teachers* for KdV Institute staff.

Education

University of Twente Enschede, Netherlands
Postdoctoral Researcher, Stochastic Operations Research *Mar 2025 – Present*

- Optimizing capacity planning and scheduling for the judiciary system using mixed-integer programming, statistical modeling and stochastic optimization (Markov models, time series, machine learning).
- Applying reinforcement learning methods for dynamic capacity management under uncertainty.

University of Amsterdam Amsterdam, Netherlands
PhD Researcher, Mathematics *Mar 2021 – Nov 2024*

- Developed adaptive appointment scheduling algorithms using queueing theory, stochastic optimization and reinforcement learning, balancing service efficiency and customer waiting time.
- Published multiple *peer-reviewed papers* on adaptive scheduling, dynamic programming, and logistics optimization.

University of Amsterdam Amsterdam, Netherlands
BSc and MSc in Mathematics (Specializiation Stochastics) *Sep 2015 – Jan 2021*

- Relevant courses: advanced machine learning, statistical models, planning & reinforcement learning.
- Minor in programming (C++, Java, Python); GPA BSc: 7.5/10, GPA MSc: 8.3/10 (cum laude).

Highlighted Projects

Follow Your Parcel — **https://ssrn.com/abstract=4919725**

- Analyzed causal relationships between route adherence (sequence deviation) and time-window performance using *causal inference* techniques.
- Developed algorithms for real-time delivery time-window updates in last-mile logistics, dynamically refining customer delivery promises throughout the day.
- Integrated stochastic modeling, routing information, and live execution data, validating significant performance gains via large-scale simulations and real-world logistics data (processed in SQL).

Amazon Last Mile Routing Research Challenge — **https://routingchallenge.mit.edu**

- Participated in the Amazon Last Mile Routing Research Challenge, developing machine-learning-driven models to predict driver routing behavior.
- Initial submission ranked **12th out of 229 teams**; subsequent model improvements would achieve a **2nd-place** ranking on the leaderboard.
- Contributed to a hybrid approach combining global learning with local optimization, later published in *Computers & Operations Research*.

Adaptive Appointment Scheduling — **https://adaptiveschedule.eu.pythonanywhere.com**

- Built an interactive decision-support web application (in `Dash` and `Plotly`) to visualize adaptive appointment schedules and real-time policy trade-offs under uncertainty.
- Designed a periodic rescheduling algorithm in Python using `SciPy` to perform real-time stochastic optimization that achieves significant cost reductions relative to static schedules.

Dynamic Appointment Scheduling — **https://dynamicschedule.eu.pythonanywhere.com**

- Developed a real-time scheduling web applet (in `Dash`) that computes optimal appointment times by minimizing expected waiting and idle costs under stochastic service dynamics.
- Formulated the scheduling problem as a *reinforcement learning* problem and implemented *stochastic optimization* to adapt future appointments in real time, guaranteeing cost savings of **up to 30%** relative to static benchmarks.

Publications & Media

University of Amsterdam (2021). Roshan Mahes, mathematical whizz, sinks his teeth into appointment scheduling.

Ghosh, M., Kuiper, A., **Mahes, R.**, Maragno, D. (2023). Learn global and optimize local: A data-driven methodology for last-mile routing. *Computers & Operations Research*.

Mahes, R., Mandjes, M., Boon, M., Taylor, P. (2024). Adaptive scheduling in service systems: A dynamic programming approach. *European Journal of Operational Research*.

Mahes, R., Mandjes, M., Boon, M. (2024). Adaptive appointment scheduling with periodic updates. *Computers & Operations Research*.

Mahes, R., Kuiper, A. (2024). Appointment scheduling with updates: An exact and optimal approach. *SSRN*.

Mahes, R., Boon, M., Kuiper, A., Mandjes, M., Bijma, F. (2024). Dynamic time-window updates in last-mile delivery: Follow Your Parcel. *SSRN*.

Mahes, R. (2024). Ding-Dong! Finally, your delivery driver is at your door. *The Network Pages*.

Mahes, R. (2024). Appointment and delivery rescheduling. *PhD thesis*.

Mahes, R. (2025). Dynamische afsprakenroosters in de zorg. *STAtOR*.

Mahes, R., Boelens, F., Boucherie, R., Zander, A. (2025). Service rate optimization in single server queues with time-varying arrivals and capacity constraints.

Skills & Languages

Technical: Mainly use Python (NumPy, Pandas, SciPy, Scikit-Learn, TensorFlow, Keras), Optimization, Statistical/Machine Learning, Reinforcement Learning, Stochastic Modeling (e.g. Time Series), Causal Inference, AWS (S3, Lambda), SQL, R, Bash, Blockchain API.
Data Visualization: Dash, Plotly (BI-style dashboards), metrics standardization.
Languages: Dutch (native), English (native-level).