Maximilien Burq, Ph.D.

✉ publications | in linkedin | ✉ burq.maximilien@gmail.com | ▪ +33.659.924.469

SUMMARY

Scientist and team lead, 8 years of experience working on novel algorithms and machine learning techniques in healthcare. Currently the technical lead for a team of 4 building wearable sensor-based digital biomarkers for neurological diseases.

WORK EXPERIENCE

Senior ML Data Scientist & Technical Lead – Verily – USA   Jan 2021 - present

Technical lead: digital biomarkers for neurological disorders.
- Managed the work of a team of 4, built a suite of sensor-based digital measures for Parkinson's disease: active tests (bradykinesia, tremor, gait) and passive monitoring of tremor and gait.
- Built state-of-the-art activity recognition models using self-supervised representation learning.
- Set the long term research roadmap, oversaw data collection across multiple observational clinical validation studies, led the publication efforts internally and with external partners.
- Responsible for delivery and analysis of results across multiple customers and clinical trials ($mm deals).
- Led the technical work (model training, implementation, testing) for our FDA DDT-COA submission.

Machine Learning Data Scientist – **Verily (f.k.a Google Life Sciences)** – USA   Nov 2018 - Dec 2020

Built human activity recognition & step counting models. (TensorFlow, Scikit-learn)
- Led data collection effort, choice of corroborative devices and label adjudication procedures.
- Implemented framework for large-scale (terrabytes) preprocessing, training, serving of models. (Apache Beam, GCP). 30% decrease in step count error, 200% reduction in user complaints.

Researcher – **MIT** – USA   2013 - 2018

Dissertation on dynamic matching algorithms applied to kidney exchange programs.
- Designed novel algorithms for online optimization and online learning.
- Coursework in linear & mixed-integer optimization, online algorithms, bayesian learning, reinforcement learning, mechanism design.

Research Scientist Intern – **Lyft** – USA   2017

Developed new marketplace optimization algorithms. Improved queueing models with online optimization.

EDUCATION

2014 - 2018	Ph.D. in Operations Research at **MIT**
2016	Visiting Student Researcher at **Stanford University**
2011 - 2014	Master's Degree in Applied Mathematics at **École Polytechnique (France)**
2009 - 2011	Classes Préparatoires in Mathematics, Physics and Informatics at **Blaise Pascal (France)**

SKILLS

Languages	English (bilingual), French (bilingual)
Domain knowledge	Digital Biomarkers, Movement disorders, Wearable sensors, Signal processing
Programming	Python (Google readability), SQL, Julia
Machine learning	TensorFlow, Keras, Jax, Xmanager, Scikit-learn
Data analysis	Pandas, Numpy, Apache Beam, Jupyter, Google Cloud Platform

Selected Publications

Burq, Maximilien, Genko Oyama, et al. (2023). "Analytical and Clinical Validity of Wearable, Multi-Sensor Technology for Assessment of Motor Function in Patients with Parkinson's Disease in Japan: an Observational Study. Working paper". In: *preprint.*

Popham, Sara et al. (2023). "Validation study for an algorithm to classify real-world ambulatory status from a wearable device using multimodal and demographically diverse data". In: *preprint.*

Burq, Maximilien, Erin Rainaldi, et al. (2022). "Virtual exam for Parkinson's disease enables frequent and reliable remote measurements of motor function". In: *npj Digital Medicine* 5.1, pp. 1–9.

Poole, Sarah F et al. (2021). "A holistic approach for suppression of COVID-19 spread in workplaces and universities". In: *PloS one* 16.8, e0254798.

Ashlagi, Itai, Maximilien Burq, Chinmoy Dutta, et al. (2019). "Edge weighted online windowed matching". In: *Proceedings of the 2019 ACM Conference on Economics and Computation*, pp. 729–742.

Ashlagi, Itai, Maximilien Burq, Patrick Jaillet, et al. (2019). "On matching and thickness in heterogeneous dynamic markets". In: *Operations Research* 67.4, pp. 927–949.

Burq, Maximilien (2019). "Dynamic matching algorithms". PhD thesis. Massachusetts Institute of Technology.

Ashlagi, Itai, Adam Bingaman, et al. (2018). "Effect of match-run frequencies on the number of transplants and waiting times in kidney exchange". In: *American Journal of Transplantation* 18.5, pp. 1177–1186.

Full list on [Google Scholar](#)

Awards

Major de Promotion, École Polytechnique	2011
Ranked 1st out of 10000 candidates on the nationwide entrance exam.	
Best project award, MIT	2014
30-day hospital Readmission Risk Prediction. (collaboration with Dell labs).	
Jean Gaillard Fellow	2015
Harvard - MIT international fellowship.	

Miscellaneous

Nationality	French
Swiss work permit	B.
Current address	Neuchâtel, Switzerland (open to relocation)