

Machine Learning Research Scientist

I began programming at nine, then trained in medicine and neuroscience through selective physician-scientist programmes, including the Ecole de l'INSERM. Over the past five years, I have concentrated on machine-learning research for health, with a particular focus on causal methods, deep sequential models, and the software needed to evaluate them rigorously. At [RE]MEDs Research, I led an artificial-intelligence research programme for drug repurposing and biomedical knowledge systems; earlier, at Babylon Health, I developed causal, Bayesian, and reinforcement-learning methods for medical triage and safety, and at BIOS Health I modelled neural and physiological signals. I now combine senior psychiatric practice with clinical research and a doctorate on when deep sequence models recover genuine causal signal rather than confounding, selection, or nuisance information. I also build open-source research tools and independent health-education products.

Research experience

Doctoral Researcher, Machine Learning and Computational Psychiatry

2022–present

University of Geneva, Faculty of Medicine

Geneva

- Develop forward, backward, autoregressive, and masked Transformer models; structural causal simulations; attribution analyses; causal corrections; and known-truth evaluations on simulated and task-based functional magnetic-resonance imaging.
- Dissertation: *From Prediction to Causal Inference in Modern Deep Sequential Task-fMRI Models*; expected in 2026 under Professor Stefan Kaiser.

Clinical Research Scientist

2021–present

Geneva University Hospitals

Geneva

- Develop causal deep-learning methods for multimodal sequential modelling in psychiatry.
- Led development of a digital mental-health research platform using React Native, React, Node.js, Python, and R; contribute to clinical outcomes, safety, biomarker, and implementation research.

Lead Artificial Intelligence Scientist

2021–2025

[RE]MEDs Research

Paris / remote

- Led research and development of a language-model and biomedical knowledge-graph programme for drug repurposing and therapeutic-hypothesis generation.
- Designed graph-based causal methods, simulation-driven validation, and target-trial-emulation infrastructure; built production Python, React, and Node.js research systems.

Albert Buchar

MD, MSc

Geneva, Switzerland

[Website](#) · [Full CV](#)

[GitHub](#) · [Google Scholar](#)

[LinkedIn](#)

RESEARCH IMPACT

Google Scholar · 9 Aug 2026

1,151 citations; h-index 11; i10-index 13.

Clinical machine-learning review

698 citations for a 2020 review of clinical decision support in infectious diseases.

SELECTIVE TRAINING

Ecole de l'INSERM · 2007

National competitive physician-scientist programme; two-year master's scholarship.

MSc Neurosciences · 2009–2011

Magna cum laude; ranked second of 60; research at the Ecole normale supérieure and Brain and Spine Institute.

Swiss National Science Foundation · 2015

MD-PhD scholarship of CHF 180,000 over three years.

Stanford · 2019

Best poster and invited panelist in artificial-intelligence-assisted care.

Research experience, continued

Machine Learning Researcher

BIOS Health

2020

Cambridge

- Developed sequence-to-sequence models for peripheral-nerve recordings and physiological time series for automated neural-signal biomarker discovery.
- Applied Bayesian optimisation and reinforcement learning to nerve-stimulation research; contributed Swift, Python, and C++ software for data collection and cardiological monitoring.

Research Scientist

Babylon Health

2018–2020

London

- Led deep-reinforcement-learning research and developed causal, Bayesian, and probabilistic methods for active diagnosis, medical triage, epidemiological sensitivity analysis, and product safety.
- Built scalable Unity and Kubernetes research environments, a model-based stopping criterion, clinician-rule validation tools, and a cross-platform C++ inference prototype with an internal tenfold speed improvement.
- Published first-author research and contributed to three patent families, including one granted United States patent.

Selected independent software

Forge

Creator and principal maintainer of a local-first system for structured memory, provenance, device synchronisation, health-data integration, and coding-agent workflows.

[GitHub](#) · [Forge](#)

Therapy Deliberate Practice

Creator of a psychotherapy-skills practice system with React, Tauri, Rust, and local Python speech and language processing for a privacy-preserving workflow.

therapy-deliberate-practice.com

QuotiDoc

Creator of a public medical-education product with daily clinical questions and structured synthesis sheets.

quotidoc.com

CausalPipe

Creator of a Python package for causal discovery, statistical testing, model comparison, and reproducible reports.

[GitHub](#) · [CausalPipe](#)

QuotiPsy

Creator of a public psychiatry-education product with daily exercises and structured psychotherapy and psychopharmacology syntheses.

quotipsy.com

Technical foundation

Python, PyTorch, R, C++, TypeScript, React, Node.js, Docker, Kubernetes, SLURM, and scientific high-performance computing.

Selected links: [Medical Decisions chapter](#) • [Medical Diagnosis chapter](#) • [Medical-triage paper](#) • [Target-trial-emulation paper](#)

SELECTED RESEARCH

Clinical machine learning

The 2020 review *Machine learning for clinical decision support in infectious diseases* has 698 citations.

Medical decisions and diagnosis

Two Springer chapters with Jonathan G. Richens, 2022; first author on *Artificial Intelligence for Medical Decisions*.

Medical triage

First-author deep Q-learning research, 2020.

Drug repurposing

High-throughput target-trial-emulation validation for systemic lupus, 2026.

CausalBOLD · in press

Known-truth causal simulations, Transformer models, attribution analyses, and controlled tests of confounding and selection in task-based functional magnetic-resonance imaging.

PATENTS

Three patent families from Babylon Health: one active granted United States patent and two published abandoned applications.

METHODS

Causal inference; structural causal models; deep sequence models; Transformers; reinforcement learning; Bayesian modelling; probabilistic inference; attribution; simulation.

LANGUAGES

French and English.