Ruben Abbou

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Summary

Data Scientist specializing in deep learning for disease detection from physiological signals (ECG, biosignals). FDA Breakthrough Device Designation and CE mark (SaMD). Delivered AI diagnostics with AstraZeneca, Pfizer, and Novartis — from signal processing and clinical data curation through multi-site validation. Published in *Heart Rhythm*, *The Lancet*, and *ACM CHI*.

Experience

Idoven — Remote (Madrid)
Senior Data Scientist — *Sep 2024 – Feb 2026*

- Led early detection research for cardiac amyloidosis (underdiagnosed heart condition) on ∼21K ECGs from ∼3K patients; compared 9 deep learning architectures with Bayesian optimization, achieving AUC 0.88; co-authored publication in *Heart Rhythm* (2026)
- Tuned model operating thresholds and calibration for regulatory performance targets; extracted clinical validation metrics across patient subgroups; prepared SaMD technical documentation for CE mark submission
- Built reproducible data pipelines to ingest and clean multi-site clinical data from European and US hospitals, achieving 4.4x processing speedup; designed data collection forms for AstraZeneca partnership

Anumana — Pfizer, Novartis — Boston, MA
Data Scientist — *Nov 2021 – Jun 2024*

- Developed deep learning algorithm for early cardiac amyloidosis detection in partnership with Pfizer; defined target population, clinical indication for use, and statistical validation protocol contributing to FDA Breakthrough Device Designation (accelerated review for novel diagnostics)
- Curated patient cohorts from 7M+ EHR records across multiple US hospitals (Spark SQL, Kedro); trained CNN and Transformer models on GPU clusters for coronary disease risk stratification with Novartis; published in *eClinicalMedicine* (The Lancet, 2023)
- Clinical trial variables were locked in millions of unstructured patient notes; deployed BERT-based NLP pipeline on Mayo Clinic data to extract structured data at scale; disease-agnostic design enabled reuse across any cardiac condition
- Rebuilt Anumana's flagship LVEF detection model from scratch — new cohorts (500K patients), updated architectures, and retraining — then built a lifetime Markov model extending the EAGLE trial with updated transition probabilities, projecting QALY gains and cost savings for payer adoption

United Nations International School & Inspirit AI — New York, NY
Machine Learning Instructor — *Jun 2021 – Mar 2024*

- Taught ML/DL to 200+ students; mentored research projects in EEG analysis, Parkinson's detection, and skin cancer classification

Publications & Posters

González-López, **Abbou, R.**, et al. ATTR-CM detection via AI-enabled ECG. *Heart Rhythm*, 2026

Abbou, R., et al. Deep Learning for Early ATTR Detection from ECG. *ESC Digital & AI*, 2025 (ePoster)

Awasthi, ..., **Abbou, R.**, et al. Coronary disease risk stratification by AI-ECG. *eClinicalMedicine* (Lancet), 2023

Chen, ..., **Abbou, R.**, et al. User Authentication via Electrical Muscle Stimulation. *ACM CHI*, 2021

Education & Research

The University of Chicago — Chicago, IL
M.S. Computational & Applied Math (ML specialization); B.S. CAM; B.A. Statistics — Dean's List — *2016 – 2022*

- **SAND Lab** (H. Zheng, 2020–21): Adversarial attacks on facial recognition and body pose models; generative models (PixelCNN) for biometric security → ACM CHI 2021
- **Applied Math** (T. Gao, 2019–20): Non-convex optimization on 3D graph domains for marine biology

Skills

ML & DL: PyTorch, TensorFlow, scikit-learn, XGBoost — CNN, LSTM, Transformer, ViT, ResNet, GNN, BERT
Data & MLOps: Python, SQL, Spark, Kedro, pandas, pyarrow — Docker, MLflow, Poetry, AWS, GCP, Git
Medical AI: biosignal processing (ECG, EEG), biosppy, time-series classification, patient stratification, clinical validation
Methods: Optuna, propensity score matching, meta-ensemble methods, NLP/NER, model calibration, uncertainty quantification
Domain: FDA regulatory (510k, Breakthrough Device), CE mark (SaMD), IFU design, clinical trials, HEOR/QALY, pharma partnerships

Interests

Competitive distance running — Film photography on 1960s cameras — High-altitude mountaineering — Interior design