

# Dr. Chris Fourie

Research MLOps Engineer | Medical Doctor  
Community Builder | High Risk Responsible AI Practitioner  
Phone: +2776 768 1853  
Email: hi@chrisfourie.africa  
Website: <https://www.chrisfourie.africa>  
Current location: Johannesburg, South Africa

## About Me

Medical doctor turned Research MLOps engineer trying to use the powers of AI for social good. Currently working full-time as a Lead Research MLOps Engineer at DVT Software, a South African software consultancy operating globally with 600+ IT professionals, with focus on AI infrastructure for major financial institutions.

### Industry Experience Highlights

- **2025-ongoing:** Lead MLOps Engineer at ABSA Bank (ZA) (via DVT Software) on MLOps project for commercial international banking credit risk analysis for large corporate clients
- **2023-2025:** Data/MLOps Engineer at Western Cape Provincial Health Data Centre
  - built digital infrastructure for privacy-preserving federated health data analysis
  - **Co-Principal Investigator:** 2-year federated analysis with Brazilian research group CIDACS investigating TB and syphilis in pregnancy (Gates Foundation funded)
- **2020-2023:** MLOps Engineer at LifeQ - health/biometric data analysis from continuous monitoring devices, COVID detection using wearables

### Technical Expertise

My experience primarily spans MLOps engineering for research in high risk AI enabling AI experimentation and service delivery on sensitive health and financial data

- **MLOps Engineering:** Software engineering (cloud, backend, and DevOps), data engineering and data science
- **Infrastructure:** AWS/Azure, Docker, Kubernetes, Terraform, Databricks, CI/CD pipeline development, end-to-end ML pipelines, model serving
- **Privacy-Preserving AI:** Large-scale federated analysis of observational health data, synthetic data generation, federated learning systems
- **Research Domains:** Healthcare data analytics, financial AI, multi-modal ML for health
- **Specialised Tools:** Container-based microservices, ETL pipelines, secure data environments for research

### Education & Research Background

- **Medical Degree (MBBCh) + MSc Computer Science** - University of the Witwatersrand (Wits), Johannesburg
- **Master's Research:** NeuroAI & multi-agent reinforcement learning under Prof. Benjamin Rosman (Time's 100 Most Influential in AI 2025) at RAIL Lab
- **Research Focus:** Biologically plausible alternatives to backpropagation - how networks of RL agents can function as nodes/neurons in neural networks
- **Publications:** Top AI conferences ACL (Social impact best paper award), ICLR, MICCAI - focusing on African healthcare AI and participatory research frameworks

### Community Leadership & Impact

- **Currently founding:** C3Data.Africa, the "African Data Commons Cooperative Collective", building communities for federated African data cooperatives.
- **Currently founding:** MLOps.Africa, a grassroots community of practice for African MLOps practitioners
- **Co-founder:** SisonkeBiotik (2020) - grassroots participatory research community making AI/ML for health research in Africa more accessible
- **Co-founder:** AfriMedQA project - novel benchmark dataset with rigorous evaluation of 20+ LLMs for African healthcare data, spanning 32 clinical specialties, contributed by 1k+ African clinicians across 15 countries
- **Technical Advisor / Steering Committee:** Data Science Without Borders project - developing capacity for federated health data analyses across institutions in Cameroon, Ethiopia and Senegal

### Motivation & Vision

I'm motivated by my experience growing up in South Africa, witnessing the devastating effects of perpetuated inequity. During my medical training, I saw first-hand the challenges this creates - the severe impact that resource scarcity and the legacy of colonialism can have on the health and wellbeing of individuals and their communities. My long-term career interests intersect at collaboratively developing industry solutions and forwarding academic efforts to address inequity, with close consideration for the diverse and complex nature of our societal systems.

## Technical Skills

- **Natural languages:** English(C2), German(B2)
- **Programming languages:** Python, C, Java, TypeScript
- **MLOps & Engineering:** End-to-end model and data benchmarking and serving pipelines
- **Cloud (AWS, Azure):** Terraform, Boto3, Chalice, Batch, SQS, SageMaker, Lambda
- **DevOps:** Jenkins, Airflow, Azure DevOps, Linux, Docker, Git
- **Backend:** SQL (Postgres, SQL Server), noSQL (DynamoDB)
- **Data Engineering:** Databricks, PySpark, Pandas

- **Digital health:**
  - Health data accessibility and security: Secure Data Environments / Trusted Research Environments, health data governance
  - Interoperability: FHIR and OpenEHR APIs
  - Federated analyses and privacy preserving methods: OMOP common data model, de-identified and synthetic data, differential privacy, homomorphic encryption, secure multiparty compute, federated learning
- **Data Science / ML:**
  - Neural Networks: PyTorch, TensorFlow
  - Scientific Computing: SciKit learn, NumPy
  - Experimentation: MLFlow, Weights & Biases
  - Data Visualization: Seaborn, Matplotlib
  - Computer Vision: OpenCV
  - Reinforcement Learning: OpenAI Gym, Stable Baselines
- **Leadership & Consulting:** Building and leading teams, Technical consulting, Academic paper writing

## Industry Experience

### Full-time

**Data / MLOps Engineer and Health Data Scientist** **2023 October – Present**  
Western Cape Provincial Health Data Center (ZA)

- Co-principal investigator for federated analysis with Brazilian National research group CIDACS on TB and syphilis in pregnancy
- Project lead to establish secure data environments / trusted research environments for research data accessibility
- Project lead for CI/CD pipeline development and Python dependency management in Databricks
- Development and maintenance of data pipelines for data ingestion and processing from both provincial public health facilities and national public health data repositories

**MLOps Engineer and Health Data Scientist** **2020 June – 2023 July**  
LifeQ (USA)

- Working on projects related to analysis of health / biometric data from continuous and remote monitoring devices
- Development of machine learning (ML) and data pipelines, backend, DevOps and cloud infrastructure for AI / machine learning

**MLOps Engineer Internship** **2020 March - May**  
DataProphet (ZA)

- Projects on ETL and cloud orchestration for ingestion of factory sensor data to ML and data pipelines

### Part-time

#### Technical Consultant

- Data Science Without Borders (Africa) - Technical advisor on steering committee **2024 February - Present**
- FruitPunch AI (Netherlands) - Developing experimentation and data pipelines for LLM based inference on genomics data **2024 October - December**
- MotherDAO Labs (Canada) - Developing AI strategy and conducting feasibility analyses **2024 October - Present**
- RetroRabbit (ZA) - Conducting technical interviews **2023 February - October**
- Cebisa Health (ZA) - Strategy consulting for electronic health record platform **2022 February - May**
- MambaInsights (UK) - MLOps software solution implementation **2020 May - August**

## Education and Academic Experience

**Masters in Computer Science (Focus on multi-agent AI/ML)** **2019 – 2022**  
University of the Witwatersrand (ZA)

- **Courses:** Machine learning, robotics, high performance computing, algorithm analysis, computer vision and reinforcement learning
- **Research:** Topics include NeuroAI, Deep Learning, Multi-Agent Reinforcement Learning. Investigated biologically plausible alternatives to back-propagation for the neural network weight update credit-assignment problem. Research title: Impact of Noise on Learned Value Functions at Depth in CoAgent Networks for Neural Network Credit Assignment
- **Projects available at:** [chrisfourie.africa/comsci-msc-projects](https://chrisfourie.africa/comsci-msc-projects)

**BSc Engineering** **2017 – 2018**  
University of Salzburg & Technical University of Munich

- First semester completed (in German) of Joint Degree Bachelorstudium Ingenieurwissenschaften

**Medical Degree (MBBCh)** **2009 – 2015**  
University of the Witwatersrand (ZA)

## Selected Publications

- **AfriMed-QA: A Pan-African, Multi-Specialty, Medical Question-Answering Benchmark Dataset** (AAAI, 2024) [link to paper]
- **AfriBiobank: Empowering Africa's Medical Imaging Research and Practice Through Data Sharing and Governance** (MICCAI, 2024) [link to paper]
- **A Framework for Grassroots Research Collaboration in Machine Learning and Global Health** (ICLR, 2023) [link to paper]
- **Essentials of Global Health Text Book** (Elsevier, 2018) - Co-Author of chapter on Trauma and Injury. British Medical Journal Book Awards, 1st place in Public Health division. [link to book]

## Communities and Academic Affiliations

- Co-founder of AfriMedQA project - Created novel benchmark dataset and rigorous evaluation of 20+ LLMs for African healthcare data, spanning 32 clinical specialties, contributed by 1k+ African clinicians across 15 countries
- African Grassroots Participatory Community Collective (Co-founder, 2023 – Present)
- SisonkeBiotik community for data science / AI / ML research for healthcare in Africa (Co-founder, 2020 – Present)
- RAIL Lab, robotics and autonomous intelligence and learning lab at University of Witwatersrand (member, 2019 – 2023)
- Deep Learning Indaba community building African AI/ML and data science capacity (community organiser, 2023 – 2024)
- Deep Learning IndabaX South Africa community building African AI/ML capacity (community organiser, 2021 – 2022)
- African Institute for Mathematical Sciences (AIMS) African Machine Learning Masters (AMMI) Rwanda, Reinforcement Learning Course (tutor, 2020)
- Computational Neuroscience Imbizo, summer school for AI and neuroscience (alumni, 2019)
- South African Medical Students Association (Director) / International Federation of Medical Student Associations (IFMSA) President South Africa (2014 – 2015)

## Conferences and Talks

- Invited speaker AI for health @ Africa Health Exhibition - "3IR b4 4IR: Data Accessibility to Enable African Data Science, ML and AI for Health" [slides] (2023)
- Invited speaker AI for health @ ICLR / IndabaX - "AI 4 Health in Production" [slides] (2023)
- Deep Learning Indaba (organizing committee, 2023)
- DS4Health Workshop @ Deep Learning Indaba (lead organiser, 2023)
- Deep Learning IndabaX South Africa (organizing committee, 2023)
- Invited speaker AI for health @ IndabaX Zimbabwe (2023)
- AML Health Workshop @ Deep Learning Indaba (lead organiser, 2022)
- Deep Learning IndabaX South Africa (organizing committee, 2021-2022)
- Deep Learning Indaba, Kenyatta University, Nairobi Kenya (presented poster on pan-African ML for health collaboration, 2019)
- IBRO-Simons Computational Neuroscience Imbizo / Summer School (participant fully funded, 2019)

## Extra-Curricular Activities

- **Outdoors:** Walks in the mountains, rock climbing, cycling and snowboarding whenever possible
- **Indoors:** Board games, reading speculative fiction, especially hard and utopian sci-fi, Ursula Le Guin, Greg Egan, Peter Hamilton, Octavia Butler and Dennis Taylor
- **Educational:** Recreational language learning, Cooking, sometimes baking, Casual sketching and water colours

## References

### Prof. Andrew Boule

Technical Director at the  
Western Cape Government Provincial Health Data Centre  
Public Health Specialist  
andrew.boule@westerncape.gov.za

[Citations]

### George Cooper

Team Lead at LifeQ  
MLOps Engineer and Systems Biologist  
+27829222334

### Prof. Benjamin Rosman

RAIL Lab Director  
University of the Witwatersrand  
Email: Benjamin.Rosman1@wits.ac.za  
Website: <https://www.benjaminrosman.com>

[Citations]