Sarah Rebecca Meyer - Medical Informatician Veterinary Scientist

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Summary

Interdisciplinary medical informatician and veterinary scientist with expertise in software engineering, leveraging data science, artificial intelligence, and machine learning. Proven track record in developing AI solutions, including predictive modelling and advanced analytics for healthcare and veterinary applications.

Key Projects

- Predictive Model for Neonatal BPD: physiology-dependent hybrid ML pipeline to estimate pulmonary shift from minimal SpO_2-PiO_2 inputs, enabling non-invasive BPD severity assessment in preterm infants as AI-driven insight for clinical decision support.
- Veterinary Anaesthesia Risk Tool: principal project investigator of a nationally selected SDSC project (1 of 50, 2024 call), development of a FAIR-compliant ML pipeline using the largest real-world dataset in veterinary anaesthesia. Managed end-to-end data engineering, preprocessing and feature engineering

Technical Skills

- Software & Tools: Ruby, Streamlit, Flask, HTML/CSS, Bootstrap, React, JavaScript, Flutter, Bash, Version Control with GitHub & GitLab, CI/CD pipelines, Docker, Test-Driven Development, Logging, Scrum
- Data Science: Python, R & SPSS, SQL, Pandas, NumPy, Scipy, Scikit-learn, TensorFlow, PyTorch
- Bioinformatics: multi-omics data processing, standard bioinformatics formats (FASTA)
- Machine Learning & AI: supervised & unsupervised learning, explainable AI (SHAP, LIME, feature importance), deep learning (FNN, CNN, YOLO)
- Biomedical & Clinical Data: signal processing, digital biomarker development, EMR Integration, standards and technologies (FHIR, DICOM, ICD-10/11)
- Data Infrastructure: SQL, data modelling, relational databases, vector databases
- Large Language Models: LLaMA, Retrieval-Augmented Generation (RAG), ChromaDB

Experience

Oct 2025 – current
Senior Researcher in BioAI | University of Bern
Research and development of AI-driven bioinformatics tools within the Innosuisse-funded BioAI4LCMS project, focusing on scalable, adaptive "Bioinformatics-as-a-Service" solutions for biopharmaceutical data analysis. Contributing to software architecture, algorithm design, and cross-institutional collaborations, and supporting additional research initiatives at the intersection of machine learning, bioinformatics, and software engineering.

Feb 2025 – Aug 2025
Researcher | Universitäts-Kinderspital beider Basel
Developed hybrid mathematical and machine learning models to assess pulmonary gas exchange in preterm infants

- Led clinical trial data analysis, feature engineering and programmed and built a streamlined ML pipeline
- Developed prototype that reduced SpO_2-PiO_2 input for bedside BPD assessment in collaboration with clinical & data science teams

Oct 2023- Feb 2025
Software Developer in Healthcare | CISTEC AG
Market leader in Hospital Information Systems in Switzerland, 250 employees

- Developed, tested and optimized functions within the hospital information system KISIM using SQL and proprietary object-oriented programming for robust clinical data workflows
- Analysed and resolved critical bugs and ensured a reliable data flow for over 30 clients including Universitätsspital Zürich (USZ)

Feb 2023 – Jul 2023
Veterinarian | Pferdeklinik Dalchenhof – Brittnau AG
Private Clinic for Equine Surgery, Sports & Internal Medicine

- Provided inpatient care and independently managed treatment plans for hospitalised equine patients
- Delivered emergency, night, and weekend intensive care
- Performed anaesthesia & post-anaesthetic monitoring

May 2019 – May 2022
Assistant | Small Animal Emergency Clinic Tierspital Zürich
Temporary positions during the BSc & MSc Veterinary Medicine

Education

Doctorate of Veterinary Medicine (Dr.med.vet) | Since June 2024
University of Zurich

Master of Science in Medical Informatics | 2023 - 2025
FHNW Muttenz | Final Grade: **5.8**[1]

- AI / ML: Machine Learning in Medicine, Explainable AI & Bias Mitigation in Healthcare, AI in Drug Discovery
- Biostatistics & Advanced Analysis: Data Analytics, Multi-omics Data Integration, Signal Processing, 1D & 2D Digital Biomarkers
- Data Privacy: GDPR/HIPAA, Cybersecurity & Cyber Resilience
- Regulatory Compliance & Data Governance: Medicines & Medical Devices Development (EMA/FDA), Data Integrity, GCP & GMP, EDC, Real-World Evidence
- Digital Health & Business Transformation: Digital Transformation in Healthcare, Business Processes in Healthcare
- Clinical Decision Support Systems: HL7

State Examination (Eidgenössisches Staatsexamen) | 2022
Eidgenössisches Departement des Innern

Master of Veterinary Medicine | Grade 5.2[1] **| 2020 – 2022**
University of Zurich

Bachelor of Veterinary Medicine | 2014 – 2020
University of Zurich

[1] Grades 1-6, 4 pass, 5.5 very good, 6 excellent

Awards

14.11.2025: Best Graduate of the MSc Medical Informatics
Fachhochschule Nordwestsschweiz (FHNW)
Awarded for outstanding overall performance in the MSc Medical Informatics, with a final grade of 5.8.

31.10.2025: Best Poster Presentation
University Children's Hospital Basel (Research Day)
Awarded for outstanding scientific communication of innovative research on machine learning models for neonatal gas exchange at the UKBB Research Day 2025.

Research

Since Oct 2025
BioAI4LCMS – AI-Driven Bioinformatics-as-a-Service for Biopharmaceutical Data Analysis
Software Engineering Group, University of Bern – in collaboration with ***Genedata AG & HES-SO Valais***; funded by ***Innosuisse***

- Developing adaptive, scalable AI/ML pipelines for LC-MS proteomics workflows in biopharma.
- Contributing to software architecture, algorithm design, and data-centric workflow automation.
- Focusing on self-assessing, generative, and explainable AI approaches for biopharmaceutical applications.
- Collaborating across academia and industry to translate research into Bioinformatics-as-a-Service (BAAS) tools.

Feb 2025 – Aug 2025
Physiology-based Prediction of Oxyhaemoglobin Dissociation Curve Shift in Preterm Infants
MSc Medical Informatics Thesis, ***Universitäts-Kinderspital beider Basel*** in collaboration with Clinical Neonatology
Manuscript in preparation for peer-reviewed publication

- Developed a hybrid physiology-driven ML pipeline to predict pulmonary gas exchange and BPD severity from minimal SpO_2–PiO_2 data.
- Led data engineering, feature design, and model validation ($R^2 = 0.94$, $\rho = 0.98$, Bland–Altman ± 12%).
- Built a Streamlit annotation tool and a containerized React/Flask web app for clinical integration.
- Collaborated with neonatologists, data scientists, and software engineers to translate AI into bedside use.

Since June 2024
Machine Learning – based Equine Anaesthesia Risk Assessment Tool
Doctoral Thesis in Veterinary Medicine, ***University of Zurich*** - in collaboration with the ***Swiss Data Science Center (SDSC)*** and the CEPEF4 Team (5 international Key Opinion Leaders in the field of Veterinary Anaesthesia)

- **AI-Driven Solutions Risk Modelling**: lead the development of a scalable ML-based anaesthesia risk prediction tool using the largest multi-source real-world dataset in equine anaesthesia, selected as one of 50 projects in the 2024 national SDSC call (1 of 9 in "Health and Biomedical Sciences").
- Pipeline Design & Clinical Data Engineering: applied advanced preprocessing, statistical modelling and ML feature engineering to high-dimensional clinical data, building reproducible pipelines for real-time risk analysis.
- Interdisciplinary Leadership: coordinated research between the University of Zurich and the Swiss Data Science Center, overseeing cross-institutional collaboration with veterinarians, data scientists and NLP-experts.
- Translational Impact: bridging veterinary and data science domains to inform clinical decision-making

Oct 2020 – Aug 2022
Master thesis "Optimization of the visualization of the facies flexoria, the dorsal aspect of the DDFT and adhesions in the bursa podotrochlearis in the standing MRI examination of equine patients"
Department of Equine Surgery Tierspital Zürich

- Quantified MRI image enhancement using positional intervention; designed and analyzed an experimental study including image acquisition, feature extraction, and statistical evaluation (SPSS) to optimize diagnostic visibility in low-field MRI

Mar 2016 – Jul 2018 / Sept 2015 – Dec 2016
Oxidative stress in sperm affects the epigenetic reprogramming in early embryonic development / Functional foot trimming to balance load distribution between the paired forelimb claws in dairy cows: An experimental study
Student Assistant involved in data collection & handling

Teaching

Nov 2025
Lab Instructor for Lecture "Search-based Software Testing"
In the Software Engineering Course at the University of Bern

Since 2025
Instructor in the Programming Course RubyMonstas
Coaching in the Women's Programming Group "RubyMonstas"

Certifications

- Cambridge Certificate of Proficiency in English (Grade A), 2018
- Inlingua Language Course in Italian A1 – B1, 2020 – 2021
- EELISA Credential - AI4Health (Level 3) | 2024; by the European Engineering Learning Innovation and Science Alliance
- HealthTech SummerSchool 2024 – Creating disruptive digital health and medical device solutions from patient needs to investor pitch at Zurich University of Applied Sciences (ZHAW)
    - Triple-E Award winning program on the pioneering Stanford Biodesign training to identify major market opportunities & invent high potential digital health solutions
    - Development of the Startup Pitch for the medical device ADHEALERT – Prediction of Abdominal Adhesions for Laparoscopic Surgeries

Languages

German	First language (C2)
English	Cambridge Proficiency (C2)
Italian	B1
French	B1

Leisure activities

Competitive Showjumping: national & international placements & victories up to 1.40m; Diving, Rock Climbing