

HANA SEBIA

PostDoctoral Researcher at Hospices Civils de Lyon (HCL) | Ph.D. in Machine and Deep Learning

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Education

Inria, Lyon Center, AIstroSight Team

Nov 2022 – Feb 2026

Ph.D. in Machine Learning and Deep Learning

Lyon, France

Université Claude Bernard Lyon 1

Sept 2020 – Sept 2022

Master's degree in Computer Science, Data Science option

Lyon, France

Université Claude Bernard Lyon 1

Sept 2017 – Sept 2020

Bachelor's degree in Computer Science, Math option

Lyon, France

Experience

Center of Excellence in Respiratory Pathogens / bioMérieux / HCL

April 2026 – Sept 2027

Project Manager – AIRISE | collaborators : Cédric Dananché, Maxime Bodinier, Marta Nunes

Lyon, France

[AIRISE] : Interdisciplinary project dedicated to the development of AI models for the early prediction of clinical deterioration in patients with respiratory infections, leveraging clinical data from the Health Data Warehouse of the Hospices Civils de Lyon (HCL).

- Developed machine learning algorithms for real-time prediction of clinical deterioration from longitudinal hospital data
- Analyzed clinical data from the Health Data Warehouse of the Hospices Civils de Lyon (HCL)
- Collaborated with clinicians, epidemiologists, and data scientists across CERP, HCL, and bioMérieux

UCL (University College London)

April 2025 – June 2025

Visiting Researcher | supervisors : Daniel Alexander, Joseph Jacob, Adam Szmul

London, UK

[HiP-CT] : Advanced X-ray imaging technique developed by UCL and ESRF, enabling non-destructive 3D visualization of whole human organs from macro to cellular scale. Collaborative work with the Satsuma group on vascular segmentation.

- Manually annotated brain vascular tree using 3D slicer
- Improved the segmentation of brain vasculature using Deep learning

Inria (French national institute for digital science)

March 2022 – Feb 2026

Thesis research | supervisor : Hugues Berry, Thomas Guyet, Benjamin Vidal

Lyon, France

[fUS-ULM] : Functional Ultrasound Imaging captures rapid hemodynamic changes but offers limited spatial resolution. Ultra Localized Microscopy provides high-resolution images but suffers from long acquisition times. Combining fUS and ULM could produce detailed images with both high resolution and fast frame rates.

- Segment fUS images to produce a brain vascular compartmentalization
- Explore spatio-temporal patterns in functional neuro-imaging
- Synthesize ULM images using deep generative models – in collaboration with UCL (Image Quality Transfer group)

Master's research | supervisor : Thomas Guyet

Lyon, France

[AI-RACLES] : A chair funded by Inria-APHP-CS aiming to develop new artificial intelligence techniques to better exploit the greater Paris university Hospital (APHP) data lake. The context of this internship is to investigate how to support the evaluation of health care pathways.

- Experimented existing approaches for patient phenotyping
- Proposed and implemented a new temporal phenotyping model
- Experimented the new model on APHP Covid-19 dataset

LIRIS (Laboratoire d'InfoRmatique en Image et Systèmes d'information) June 2020 – September 2021

Research Student | supervisor : Hacid Mohand Saïd

Lyon, France

[KANOPEE] : A project in partnership with Bordeaux University Hospital, aiming to extract meaningful insights from data collected using an application offering clinical identification and advice to limit sleep problems.

- Summarized statistical description of attributes
- Carried out data visualisation
- Applied Machine Learning algorithms (data clustering)

[QUALITOP] : European project aiming to develop a big data analysis platform to monitor health status and quality of life of cancer patients.

- Elaborated the database conceptual model
- Managed the data quality and carried out data pre-processing (harmonization and imputation)
- Applied Machine Learning algorithms (data clustering)
- Worked within a team of associate professors and physicians

Summer Schools

Learning Expedition to Global Summit - Hello Tomorrow | *Paris, France* **March 2023**

- Introduction to entrepreneurship
- Overview of available startup funding options
- Understanding of support structures for startups (incubators, accelerators, etc.)
- Engagement with industry professionals and insights from their experience

AI4Health, Health Data Hub | *Paris, France* **July 2023**

- Machine Learning for time series with applications to health
- Deep learning for medical image processing
- Causal inference for health application
- Clinical text analysis

European Summer School on Artificial Intelligence (ESSAI) | *Ljubljana, Slovenia* **July 2023**

- AutoML techniques and optimization
- Large Language Models (LLMs) fundamentals
- Fairness and privacy in AI
- Continual learning for image classification

Decentralized Learning | *Lyon, France* **September 2023**

- Fundamentals of ML for distributed systems
- Environmental and ecological impact of distributed learning
- Federated learning applications in biotech
- Communication strategies in federated systems

Software

SWoTTeD | *python* **April 2022 – Nov 2022**

- * Implemented a novel tensor decomposition model to extract temporal recurrent patterns

Evaluation Engine for Datalog | *Java* **June 2021**

- * Implemented the Top-down query evaluation engine

Scrabble move generation | *C++* **April 2020 – June 2020**

- * Implemented the faster algorithm to generate every possible move giving a rack and a given square

MatriXMiX | *C++* **March 2019 – May 2019**

- * Implemented matrix basic and advanced operations (diagonalization and decomposition)

Teaching

Introduction to Machine Learning | *3rd year of Engineering school* **May 2026 – June 2026**

Lectures and practical sessions

EPITA, France

Deep Learning | *2nd year of Master's degree in Data Science* **Nov 2024 – Jan 2025**

Lectures and practical sessions

Lyon 1 University, France

Learning and Data Analysis | *1st year of Master's degree in Data Science* **Oct 2024 – Jan 2025**

Practical sessions

Lyon 1 University, France

Logic Programming | *Bachelor's degree in Computer Science* **Sep 2024 – Nov 2024**

Practical sessions

Lyon 1 University, France

Databases and web development | *Bachelor's degree in Computer Science* **Feb 2024 – Apr 2024**

Practical sessions

Lyon 1 University, France

Deep Learning | *2nd year of Master's degree in Data Science*

Lectures and practical sessions

Nov 2023 – Jan 2024

Lyon 1 University, France

Basics of Architecture | *Bachelor's degree in Computer Science*

Sep 2023 – Nov 2023

Practical sessions

Lyon 1 University, France

Application design and development | *Bachelor's degree in Computer Science*

Mar 2023 – May 2023

Practical sessions

Lyon 1 University, France

Databases and web development | *Bachelor's degree in Computer Science*

Feb 2023 – Apr 2023

Practical sessions

Lyon 1 University, France

Publications

- **Hana Sebia**, Thomas Guyet, Hugues Berry, Benjamin Vidal. Adapting Temporal Tensor Decomposition for Spatiotemporal Pattern Extraction in Functional Neuroimaging. In: De Marsico, M., et al. Pattern Recognition. ICPR, August 2026, Lyon, France
- **Hana Sebia**, Thomas Guyet, Hugues Berry, Seunghoi Kim, Daniel C. Alexander, Benjamin Vidal. Improving Spatial Resolution in Functional Ultrasound Through ULM-Guided Generative Learning. Colloque Français en Intelligence Artificielle en Imagerie Biomédicale (IABM), Mar 2026, Lyon, France.
- **Hana Sebia**, Thomas Guyet, Hugues Berry, Benjamin Vidal. Spatiotemporal patterns extraction in functional neuroimaging. Conférence Francophone en Apprentissage Automatique (CAp), Jun 2025, Dijon, France.
- **Hana Sebia**, Thomas Guyet, Hugues Berry, Benjamin Vidal. Vascular Segmentation of fUS Images using Deep Learning. Colloque Français en Intelligence Artificielle en Imagerie Biomédicale (IABM), Mar 2025, Nice, France.
- **Hana Sebia**, Thomas Guyet, Mickaël Pereira, Marco Valdebenito, Hugues Berry, et al.. Vascular Segmentation of Functional Ultrasound Images using Deep Learning. International Journal of Computers in Biology and Medicine (CIBM). 2025
- **Hana Sebia**, Thomas Guyet, Etienne Audureau. SWoTTeD: an extension of tensor decomposition to temporal phenotyping. International Journal of Machine Learning, April 2024.
- **Hana Sebia**, Thomas Guyet, Etienne Audureau. Une extension de la décomposition tensorielle au phénotypage temporel. Conférence Française d'Extraction et Gestion des Connaissances 2023, Lyon, France, volume E-39 of RNTI, pages 43-54.
- **Hana Sebia**, Tarik Boumaza, Marie Le Guilly, Mohand-Said Hacid, Delphine Maucort-Boulch. Impact de la pollution de l'air sur la mortalité : État des lieux et approches. Conférence Française d'Extraction et Gestion des Connaissances 2022, Blois, France, volume E-38 of RNTI, pages 483-484.

Technical Skills

Programming languages: Python, R, SAS, Java, C/C++, SQL, Prolog, Datalog

Machine learning frameworks: PyTorch, Scikit-Learn, Pandas, Spark, Storm, D3.js, Slicer

Languages: French (native), English (professional use)