# Hana SEBIA

Ph.D. Candidate of AIstroSight team at Inria Lyon center
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## Education

**Inria, Lyon Center, AIstroSight Team** **Nov 2022 – December 2025**
*Ph.D. candidate in Machine 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

**UCL (University College London)** **April 2025 – Ongoing**
*Visiting Researcher | supervisor : Daniel Alexander* *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 – Ongoing**
*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

## 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

**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*** **Nov 2023 – Jan 2024**
Lectures and practical sessions *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. Spatiotemporal patterns extraction in functional neuroimaging. Conférence en Apprentissage Automatique (CAp), Jun 2025, Dijon, France.
- **Hana Sebia**, Thomas Guyet, Hugues Berry, Benjamin Vidal. Vascular Segmentation of fUS Images using Deep Learning. 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. Computers in Biology and Medicine (CIBM). 2025
- **Hana Sebia**, Thomas Guyet, Etienne Audureau. SWoTTeD: an extension of tensor decomposition to temporal phenotyping. Machine Learning, April 2024.
- **Hana Sebia**, Thomas Guyet, Etienne Audureau. Une extension de la décomposition tensorielle au phénotypage temporel. In EGC 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. In EGC 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
**Languages**: French (native), English (professional use)