

# Pierre Hollebèque

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<https://github.com/PierreHollebeque>

As a first-year Master's student in Artificial Intelligence and Machine Learning at DTU, I am seeking a student job to gain practical experience and further develop my skills.

## Education

**Technical University of Denmark, MSc Human-Centered Artificial Intelligence** Sept 2025 - July 2027

- Double-degree with Centrale Lyon
- Specialisation in Machine Learning, Deep Learning, UX Design, Social Graphs and Computational Tools for Data Science.

**Centrale Lyon, General engineer** Sept 2023 – July 2027

GPA : 3.92/4 - Jury's congratulations

- General Courses : Mathematics, Physics, Computer Science, Telecommunication, Electronics, Mechanical Engineering and Economics.
- Specialization: Probabilities & Statistics, Genetic algorithms & Ant colonies, Image Sensing and Processing, Machine Learning, Constraint Logic Programming.

**Lycée Chateaubriand, Preparatory classes (MPSI-MP\*)** Sept 2021 – July 2023

- Two-year intensive French program preparing for the competitive entrance exams to top engineering schools.
- The curriculum focus on Advanced Mathematics, Physics, Computer Science and French Literature & Philosophy with a strong emphasis on theoretical rigor. MP\* corresponds to the second year, reserved for top students.

## Experience

**Generative AI Intern, NIJI – Rennes, France** Apr 2025 – Aug 2025

- **Design of an AI-powered Learning Solution:** Led the end-to-end conception of a corporate training tool designed to optimize memory retention and skill acquisition.
- **Neuroscience-based:** Conducted state-of-the-art research on cognitive learning methods to integrate evidence-based educational principles into the product features.
- **RAG Implementation:** Leveraged Retrieval-Augmented Generation (RAG) to transform static training repositories into an interactive and searchable knowledge base.
- **Agentic Workflow Automation:** Designed AI agent workflows to automatically generate question banks and assessment materials from existing documentation, streamlining content creation.
- **Adaptive Learning Algorithm:** Conceptualized a recommendation engine that personalizes the learning path by adjusting question difficulty according to the learner's proficiency level.

## Projects

**Feature alignment for unpaired infrared image translation in the microstructures of composite materials, DTU** Nov 2025 - Dec 2025

- **Infrared Super-Resolution:** Developed a **Cycle-GAN** solution trained on **unpaired data** to upscale low-resolution sensor outputs into high-fidelity images, significantly reducing hardware costs for physical experiment monitoring

## Analysis of the Evolution of Alliances and Polarization in the French National Assembly, DTU

Nov 2025 - Dec 2025

- **Graph Theory & Network Analysis:** Constructed legislative graphs based on roll-call votes (14th-17th legislatures) to model political alliances.
- **Unsupervised Learning:** Applied Louvain community detection to identify evolving political blocs and quantify the erosion of the traditional left-right cleavage.
- **NLP & Text Mining:** Implemented an adapted TF-IDF approach to characterize the linguistic priorities of each identified community.

## Research Project - State-of-the-art review of the Transformer architecture in AI, Liris Laboratory & Centrale Lyon

Oct 2024 - Apr 2025

- **Theoretical Research:** Conducted a comprehensive state-of-the-art review of Transformer models (**history, mechanics, fine-tuning, RAG**) and authored a 100+ page technical report on **ethical challenges**.
- **Practical Implementation:** Built a **Seq2Seq Transformer model** from scratch, **fine-tuned a BERT model**, and developed a **RAG** system using Mistral-7B.

## Study Project - Modelling wildfire behavior and crowd dynamics, Centrale Lyon

Oct 2023 - May 2024

- **Simulation & Leadership:** Led a team of 6 to develop a simulation model for wildfire behavior and crowd dynamics, awarded the **Francis Leboeuf Prize** for Best Project (2023).

## Skills

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**Programming Languages:** Python, Matlab, SQL, Prolog

**Machine Learning:** PyTorch, TensorFlow, Hugging Face, Scikit-learn

**Tools & Platforms:** Git, Streamlit, Figma, HPC (Remote Supercomputing)

**Languages:** French (Native), English (C1)