Postdoctoral Fellow Offer

Duration : 18 - 24 months

Job title : Postdoctoral fellow in computer science
Employeur : University of Rennes – IRISA research laboratory
Starting date : as soon as possible
Job location : Rennes or Lannion

We are looking for a postdoctoral researcher to work on a unique and innovative project, **PrediObso**, focused on developing an intelligent decision-support system for predicting obsolescence of critical industrial components (space, aviation, marine, etc.).

The system is built around a **conversational interface** for decision making, powered by a **prediction model** coupled to an **LLM-RAG system** that integrates proprietary obsolescence data with rich external data sources (Figure 1).

The work will primarily contribute to **Work Package 3: System Development** of the project, led by IRISA / DRUID.

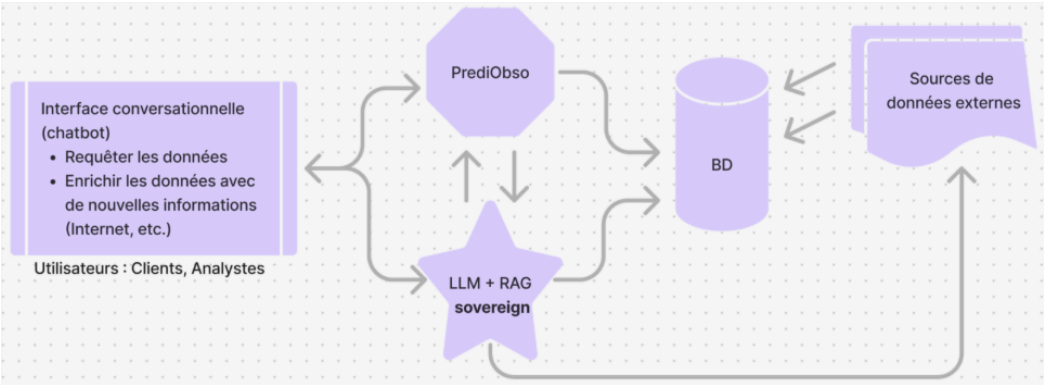


Figure 1: Overview of the architecture of PrediObso.

Mission and Responsibilities

The Postdoctoral Fellow will work with a research engineer on AI and HCI research and development:

AI / RAG Design

- Design and refine the initial **PrediObso** model (Phase 1) using proprietary data for obsolescence prediction.
- Design, implement, and optimize the **LLM + RAG** sovereign module (Phase 2) to effectively integrate, retrieve, and contextualise information from external data sources for enriched predictions.

- Evaluate the performance, robustness, and interpretability of the prediction and RAG models.

HCI and Conversational Interface Design

- Design, prototype, and evaluate the conversational interface to ensure intuitive querying and effective data enrichment by users (clients, analysts).
- Develop strategies for displaying, explaining, and justifying obsolescence predictions to end-users (XAI).
- Conduct user studies (interviews, usability tests) to gather feedback and iteratively improve the user experience and dialogue flow.

Writing

- Produce research papers and technical reports.

Research Questions

The Postdoc is encouraged to **shape their research agenda around —but not limited to— the following questions**:

1. **RAG & Knowledge Integration**
   How can a sovereign LLM and RAG system be optimised to synthesize heterogeneous internal and external data (e.g., technical specs, market trends, news) to enhance the accuracy and contextuality of obsolescence predictions?
2. **Trust & Explainability (XAI)**
   What conversational and visualisation strategies best convey the certainty, source, and reasoning behind an obsolescence prediction to a professional analyst or client, thereby building trust in the AI-driven decision support?
3. **Interface Design and Decision Support**
   Beyond pure conversation, what interface design strategies (e.g., data visualisation, dynamic dashboards, knowledge-graph integration derived from RAG) enable users to compare, weigh, and make informed decisions about obsolescence, synthesising the model's predictions with raw external data?
4. **User Interaction Design**
   How should the conversational interface allow users to enrich data with new information (Internet, etc.) through dialogue, and how does this user-contributed information influence the RAG and prediction pipeline?
5. **Model Iteration**
   How can user feedback and interaction data gathered from the chatbot be systematically channelled back to continuously improve underlying **PrediObso** and LLM + RAG models?

Required Profile

A successful candidate should demonstrate expertise in one or more of these areas:

- Strong background in machine learning, particularly in LLMs and RAG.
- Proficiency in Python and relevant ML/NLP frameworks (PyTorch, TensorFlow, Hugging Face).
- Familiarity with Explainable AI (XAI) concepts and techniques.
- Familiarity with web technologies (JavaScript, React.js, etc.)
- Experience in conversational AI/chatbot design, prototyping, and evaluation.
- Knowledge of User-Centred Design (UCD) principles and user research (interviews, heuristic evaluation, usability testing).
- Ability to work independently and collaboratively with the research team and partners.
- Fluency in English (written/spoken), knowledge of French is useful, but not required
- PhD defended in the last 3 years

We offer

Successful candidates will join the IRISA – Institute for Research in Computer Science and Random Systems – which is today France's largest research laboratory (over 850 people) in the field of computer science and information technologies. It covers all topics in these areas, from computer and network architecture to artificial intelligence, through software engineering, distributed systems, and virtual/augmented reality.

Candidates will benefit from:

- Highly interdisciplinary, collaborative research setting
- Travel to conferences, workshops, and collaborative projects
- Direct engagement with external stakeholders
- Robust network of researchers and industry partners in AI and technology
- Flexibility to shape their own research agenda
- Competitive salary

Application procedure:

Candidates are invited to submit a complete application including:

- A detailed CV (education, technical skills, relevant experience, publications)
- A cover letter explaining your interest in the position, your skills in relation to the role, and your availability
- One or two letters of recommendation or contact details for references

Please send your complete application or any questions about the position to
Prof. Zoltan MIKLOS at **zoltan.miklos@irisa.fr**.