

PhD Subject Summary: Adaptive and Secure Orchestration of AI Agents for Intelligent Workflows in the Agentic Web

Partner institutions: University of Tours (France), Université du Québec en Outaouais (Canada),

Keywords: Artificial intelligence, autonomous agents, system coordination, digital trust, security, Web

Context

The development of increasingly autonomous artificial intelligence systems is paving the way for what is now referred to as the “Agentic Web”: an environment in which digital agents are able to discover one another, communicate, and cooperate in order to accomplish complex tasks, without requiring direct human intervention at every step. This evolution is transforming the way digital services are designed and used, particularly for the automation of long, multi-step tasks.

While individually deployed agents already show promising results, coordinating them into genuine intelligent workflows remains a major challenge, especially when these agents operate in open, distributed, and heterogeneous environments, where trust between agents becomes a central concern.

Challenges and Objectives

This PhD subject is part of this broader effort and aims, in general terms, to propose an approach enabling artificial intelligence agents to collaborate more flexibly, reliably, and safely within complex workflows. This involves better understanding how to organize cooperation among specialized agents, how to ensure the reliability of exchanges in a decentralized environment, and how to integrate trust and security mechanisms throughout the coordination process.

The thesis will thereby contribute to the emergence of more robust and better-controlled frameworks for the orchestration of artificial intelligence agents, with particular attention paid to their evaluation in realistic usage scenarios.

Candidate Profile

Master's degree (or equivalent) in Computer Science, Artificial Intelligence, Cybersecurity, or a related field. A good understanding of distributed systems, artificial intelligence, and digital trust and security issues is expected, along with solid programming skills. Autonomy, scientific rigor, and a good command of English are also required.

Supervision and Arrangements

The PhD will be jointly supervised, under an international co-supervision agreement, by:

- Kamel Adi, Université du Québec en Outaouais (UQO), Canada
- Yacine Sam, University of Tours, France

The PhD will take place within an international collaboration between France and Canada, with approximately 18 months spent in each country.

How to Apply

Applications must include:

- A curriculum vitae (CV)
- A motivation letter
- Master's transcripts
- Recommendation letter(s) (optional)

Applications should be sent to: kamel.adi@ugo.ca and yacine.sam@univ-tours.fr

Application Deadline : October 15, 2026