

Expression of Interest (EoI)

MSCA Postdoctoral Fellowships 2026

Host Institution: Mälardalen University, Sweden — Department of Computer Science and Engineering, The Industrial Software Engineering Research Group

Project

The role of models in agentic development of software-intensive systems

Hosting Information: Mälardalen University, Sweden

Offer Deadline: July 1st, 2026

EU Research Framework: Horizon Europe - MSCA Postdoctoral Fellowships 2026

Country: Sweden

City: Västerås

Organisation/Institute

Organisation/Company: Mälardalen University, Sweden

Department: Department of Computer Science and Engineering

Secondment opportunity: University of L'Aquila, Italy

Contact Information

Organisation / Company Type: Higher Education Institution

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Secondment/Collaboration Opportunity:

Up to eight months: Software Engineering Research Group, University of L'Aquila, Italy (Prof. Henry Muccini)

Description

Project Title: The role of models in agentic development of software-intensive systems

Research Context & Motivation

Development of software and software-intensive systems is undergoing a radical transformation, where a large number of activities that are currently performed by human developers will instead be carried out by AI-agents. An initial phase, where agents support individual developers performing specific tasks, will in many domains change into a process where autonomous agents communicate and collaborate directly, and where the overall process is being orchestrated and monitored by human engineers.

Models of various kinds, ranging from informal architectural drawings to detailed models adhering to a well-defined modelling language such as SysML, play a vital part in a traditional, human-centric development process, for communication between development teams and external stakeholders, representation of design decisions, providing support for analysis and validation, etc. In an agentic development context, however, some uses of models are likely to become obsolete, while others will remain useful means of communicating between different agents and/or between an agent and a human developer, for example to validate or adjust the output from an agent suggesting an appropriate architecture before it is taken as input by agents responsible for more detailed design and implementation.

Goal & Objectives

The project will investigate the role of models as a means for agent-to-agent communication as well as between agents and human developers, throughout the development and operation phases of software-intensive systems. The objectives are to advance the state-of-art in research themes such as

- Establishing and categorizing the usage of models for different aspects of communication, information representation and visualization during agentic development, and characterizing what makes them useful.
- Developing means of dual purpose (agent/human) modeling.
- Investigating traceability, model/artifact consistency and synchronization in an agentic development context.
- Proposing concrete modeling approaches, languages and/or artifacts that facilitates development.
- Empirically evaluating proposed solutions.

Research Method

Multiple research methods will be used to address the objectives, ranging from empirical investigations (e.g., surveys and interviews with practitioners to investigate industrial state-of-practice and ongoing initiatives, to exploratory/constructive work to gain insights and develop solutions to specific problems. The postdoctoral fellow is expected to contribute actively to the selection of research focus and suitable methods to address it.

Technology & Infrastructure

The fellow will have full access to:

- Workspace at MDU's Västerås campus, integrated into the research group's collaborative environment.
- Individual high-end laptop and access to national high-performance computing resources.
- MDU's digital library and specialized IEEE/ACM databases.

Expected Output

The project is expected to yield high-impact results, including at least one publication in a Q1 journal and presentations at flagship conferences such as ICSE, MODELS or ICSA. Beyond academic output, the project aims to produce proof-of-concept prototypes, which could lead to technology transfer opportunities with industrial partners.

For the postdoctoral fellow, the project provides a great opportunity to advance their scientific independence and leadership as well as to grow their academic and industry networks. It will also allow the fellow to gain specialized expertise in the critical intersection of software engineering and AI.

Proposing University

Mälardalen University (MDU) was established in 1977, as a result of collaboration with local industry, and currently has campuses in Eskilstuna and Västerås. MDU has decades of experience in collaboration with the wider society, where co-production/co-creation has been an integral part of the education and research. The Department of Computer Science and Engineering (IDD) is the leading academic environment in Sweden in research related to embedded systems. Research at IDD is organized in four focus areas: 1) Software and Systems Engineering, 2) Computer and Data Science, 3) Electrical & Computer Engineering and 4) Medical and Health Engineering. Well-aligned with these research areas, IDD has a comprehensive educational offering, including education and degree programs at all levels, as well as continued education targeting the industrial work force. Our undergraduate programs include Computer Science, Computer Networks and Communications, and Applied AI. Covering both basic and advanced cycles, we offer a Master of Science in Engineering program in Computer Engineering. We also offer master programs in Software Engineering, Intelligent Embedded Systems and Cybersecurity. MDU has been the coordinator/workpackage leader in a large number of EU- Horizon, Chips-JU, and MSCA Projects.

Our Support for Your Proposal

We don't just host you; we help you win. Candidates selected for this topic will receive:

- **Support in preparing for the MSCA Postdoctoral Fellowship application**, including individual consultation, proposal review, and guidance from experienced mentors at ÅA and former MSCA fellows.

Candidate Requirements

- **Degree:** A recent PhD in Computer Science, Software Engineering or related disciplines (preferably awarded in 2021 or later). It must be obtained by Sept 9, 2026, and not earlier than Sept. 2018.
- **Prior Knowledge:** Proficiency in industrial software and systems development, agentic AI, and model-based development.
- **Publications:** A strong publication track record (e.g., high-impact journals and conferences)
- **Language and Other Skills:** Excellent command of spoken and written English, strong interpersonal skills, and the ability to work both independently and in a team.
- **Mobility Rule:** Candidates must not have resided in Sweden for more than 12 months in the 3 years prior to the deadline.

Interested?

Interested candidates should send the following to jan.carlson@mdu.se by **July 1, 2026**:

1. A brief CV (max 2 pages).
2. A motivation letter (1 page) outlining research alignment.
3. A 1-page summary of your proposed research idea.

We look forward to building a winning proposal with you!