

Expression of Interest (EoI)

MSCA Postdoctoral Fellowships 2026

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

Project

Agentic Software Engineering for Critical Industrial 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: [Secondment university, if applicable]

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: Agentic Software Engineering for Critical Industrial Systems

Research Context & Motivation

Safety and security concerns are paramount in many critical real-world application domains such as health care, aerospace, autonomous transportation and industrial control systems. Though there are several domain-specific standards and guidelines, many developed systems also exhibit vulnerabilities and anomalies. There is a growing interest from industries in utilizing the advances in AI/ML in their design and development stages, though there are also concerns related to their impact on their dependability aspects.

Research in the proposed project will explore agentic AI in multiple phases of SE from requirements engineering to V&V and certification, with a strong focus on designing and evaluating AI-powered systems for safety-critical environments.

Goal & Objectives

The project will explore the recent developments in agentic systems and their applicability in supporting various lifecycle phases of software development for safety critical systems.

Our objective is to advance the state-of-the art in research themes such as

- Translating informal and multimodal inputs into structured, verifiable requirements
- Integrating regulatory compliance (e.g., safety, security) into requirements and design.
- Designing agents capable of planning, reasoning, and acting over development tasks
- Evaluating reliability and failure modes
- Empirical evaluation of performance, safety, and usability of Agentic AI based systems

Research Method

The project follows multiple analytical/quantitative and exploratory research paradigms as well as building research prototypes using the design science approach.

In alignment with **Open Science** practices, all developed algorithms and nonproprietary datasets will be published in Open Access repositories (e.g., Zenodo), and the project will adhere to a Data Management Plan ensuring FAIR (Findable, Accessible, Interoperable, Reusable) data standards.

Technology & Infrastructure

The fellow will have full access to:

- **Dedicated Research Resources:** Individual High-end laptop and access to National High-performance computing resources.
- **Full access to:** MDU's digital library and specialized IEEE/ACM databases.
- **Workspace:** At MDU Västerås campus with access to Smart labs and integrated into the research group's collaborative environment.

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**, **DSN** or **SafeCOMP**. Beyond academic output, the project aims to produce a **proof-of-concept prototypes** which could lead to technology transfer opportunities with industrial partners.

For the fellow, this project provides a great opportunity to **professional independence and innovation leadership** by establishing a distinct research line within MDU's **Dependable Software Engineering Research Group**. This will allow the fellow to gain specialized expertise in the critical intersection of software engineering and AI as well to develop collaborations with MDU's industrial partners such as **ABB**, **Ericsson** and **Volvo CE**.

Proposing University

Mälardalen University(MDU) was established in 1977 as a result of collaboration with 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 focuses on 4 research profiles, viz., 1) Software and Systems Engineering, 2) Computer and Data Science, 3) Electrical & Computer Engineering and 4) Medical and Health Engineering. Well-aligned with the research is its 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 and Computer Networks and Communications. Covering both basic and advanced cycles, we offer three Master of Science in engineering programs (in Robotics and in Dependable Aerospace Systems and Cyber Security). We also offer two international master programs in Software Engineering and Intelligent Embedded Systems. MDU has been the coordinator/workpackage leader in a large number of EU-Horizon, Chips-JU, 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:** Knowledge on **industrial safety critical systems, embedded systems development, assurance techniques, Artificial Intelligence (AI) and intelligent agents** for the development of autonomous systems.
- **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 sasikumar.punnekkat@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!