PhD Student Vacancy for the Lowcomote Project

DevOps Support for Low-Code Engineering Platforms

JK University of Linz is hiring a PhD Student for its Lowcomote Project in Linz, Austria.

The Lowcomote project

The MSCA ITN 2018 project Lowcomote will train a generation of experts that will upgrade the current trend of Low-code development platforms (LCPDs) to a new paradigm, Lowcode Engineering Platforms (LCEPs). LCEPs will be open, allowing to integrate heterogeneous engineering tools, interoperable, allowing for cross-platform engineering, scalable, supporting very large engineering models and social networks of developers, smart, simplifying the development for citizen developers by machine learning and recommendation techniques. This will be achieved by injecting in LCDPs the theoretical and technical framework defined by recent research in Model Driven Engineering (MDE), augmented with Cloud Computing and Machine Learning techniques.

The Lowcomote project will train the first European generation of skilled professionals in LCEPs. The 15 future Early Stage Researchers (ESRs) will benefit from an original training and research program merging competencies and knowledge from 5 highly recognized academic institutions and 8 large and small industries of several domains. Co-supervision from both sectors is a promising process to facilitate agility of our future professionals between the academic and industrial world.

Partners

IMT Atlantique (FR), University of York (UK), Universidad Autónoma de Madrid (ES), University of L'Aquila (IT), JK University of Linz (AT), British Telecom (UK), Intecs (IT), Uground (ES), CLMS (UK), IncqueryLabs (HU), SparxSystems (AT), Metadev (ES), The Open Group (UK)
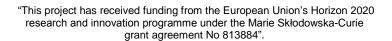
Training activities

The training program of Lowcomote aims at enabling the recruited ESRs to develop a broad range of scientific, technical and transferable skills that will prepare them for fruitful careers in academia and industry, namely thanks to training led by world experts in the field and timely and high-quality feedback by all co-supervisors.

In particular, the network will provide training for the three main competences needed for developing future LCEPs:

- MDE, for domain analysis, language construction and code generation;
- Cloud computing, for an efficient use of the Cloud infrastructure to manage a large number of users and artefacts;
- Machine learning, for building smart assistants for citizen developers.

Other training activities will include communication, career development and plan, and entrepreneurship.

Phd. research topic: DevOps Support for Low-Code Engineering Platforms

Within the context of the Lowcomote project, the Phd candidate will work to the following specific research subject.

Objectives: Tackling the challenge of managing the full life-cycle of software systems requires a well-defined mix of approaches. While in the early phases model-driven approaches are frequently used to design systems, in the later phases data-driven approaches are used to reason on different key performance indicators of systems under operation. This immediately poses the question how operational data can be mapped back to design models to evaluate existing designs and to reason about future re-designs. This is also reflected in the current DevOps movement to better synchronize the software development with IT administration and operation. Of course, this is of particular importance in long-living systems such as industrial automation systems or domains where frequent requirement changes are expected due to missing information in the development phase or rapidly changing user behavior.

The main objective of this project is to provide a generic methodology to harmonize model-based and measurement-based approaches. In particular, a low-code engineering framework is required which also supports runtime data management and analytics to reason about runtime properties of systems which are derived from and aligned with design models. Having this systematic generation of data management and analytics opens the door to analyze data through design models which acts as a common communication model between development and operation. Having such a framework is of particular importance to reason also about possible design improvements for which exploration techniques can make use of the data analytics capabilities by running simulations before deploying the improvements in the operational settings.

Expected results: The goal of the project is to provide a generic methodology for LCEPs to derive a runtime data management and analytics capabilities which fills the gap between software development and IT administration and operation. The project will develop an open-source framework that is able to express runtime concerns in models as well as to analyze these concerns during operation. Finally, this framework will enriched by an execution platform for highly-scalable, distributed design space exploration algorithms which make also use of the data analytics by simulation techniques..

Requirements

Degree: Master degree in Computer Science or equivalent providing access to PhD programs.

Language: English proficiency must be attested either through a previous English language diploma, or an internationally recognized proficiency test (at least C1 level of the Common European Framework of Reference for Languages i.e. IELTS, IBT, TOEFL or Cambridge).

Career: When starting their contract (September 2019), selected researchers should be within the first four years of their careers. This means being both within a four years window following their most recent graduation and not having been awarded a prior doctoral degree so far.

Mobility: At the time of recruitment, the researcher must not have resided, or carried out his/her activity in Austria for more than 12 months in the 3 years prior to recruitment date.

Employment conditions

Full-time Equivalent Position

Duration: 36 months, including 2 secondments of 3 months each at other consortium members' premises (see Hosting institution section)

Starting date: 1st September 2019

Remuneration:
The gross remuneration will approximately amount €3,000 (if the researcher has no family) or €3,250 (if the researcher is married or in civil partnership).

Research, Training and Networking costs:
All relevant expenses linked to the research and training activities (travel, accommodation, etc.) will be paid by the project budget.

Hosting institution

The Johannes Kepler University Linz (JKU Linz, http://www.jku.at) is a young European university with a focus on the academic areas of social and economic sciences, law, natural sciences and engineering. The studies of Human Medicine were added in 2014. During its fifty year history, the university has achieved a national and international standing with its manifold achievements in research and teaching. The JKU is a campus-style university located north of the city of Linz.

As the largest institution of research and education in Upper Austria, and thus as a knowledge transfer center, the university contributes to the continual support and development of Upper Austria as a dynamic economic region. The JKU is also actively involved in competence centers, and has developed spin-off programs that support the establishment of new companies.

ESRs will be hosted at the Institute for Business Informatics - Software Engineering

Altenberger Straße 69
Science Park 3, Zwischengeschoss ZA
A-4040 Linz / Austria / Europe

The ESR will spend 2 secondments of 3 months at the premises of 2 project's members as detailed in the following table.

	Planned Secondments	Hosting Partner	Start – End Date
1	Collaborate with ESR5 on integrating Active DSLs with runtime information and runtime analytics	Universidad Autónoma de Madrid (Madrid, Spain)	M18 – M20 (June – August 2020)
2	Collaborate with ESR13 on testing scalability characteristics of simulation-based exploration in various application domains	IncqueryLabs (Budapest, Hungary)	M26 – M28 (Feb. – April 2021)

Supervisors

Manuel Wimmer, manuel.wimmer@jku.at

Application process

All applications shall be sent before April 15 2019 by filling in the form on the Lowcomote website: https://www.lowcomote.eu/esr/09/

Applications are composed of the following documents in English (and when necessary a certified translation of official documents):

1. a complete CV with references to past research and training experiences;
2. a motivation letter highlighting the consistency between the candidate 's profile and the chosen ESR position for which they are applying;
3. at least 2 reference contacts (could be substituted by a reference letter, which should be in English or in certified translation)
4. scan of the degree qualification.
5. scanned copy of valid identification document (identity card or passport)
6. proof of proficiency in English (either through a previous English language diploma, or an internationally recognized proficiency test - at least C1 level of the Common European Framework of Reference for Languages i.e. IELTS, IBT, TOEFL or Cambridge).