PhD Student Vacancy for the Lowcomote Project

Low-code Development of Rich Collaborative Mobile Apps using Active DSLs

The Universidad Autónoma in Madrid is hiring a PhD Student for its Lowcomote Project.

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 recognised 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: Low-code Development of Rich Collaborative Mobile Apps using Active DSLs

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

Objectives: Some LCDPs permit creating mobile apps. However, such apps are typically mere CRUD applications that interact with a server exchanging data collected via forms.

In order to scale the supported apps beyond simple form-based interaction, we propose a novel approach to low-code development of rich collaborative mobile apps. The resulting applications will offer interaction mechanisms based on graphical diagramming, where elements may be geolocated on maps. They will be able to incorporate information from open APIs to access services (e.g., weather), or interact with social networks. They may be context sensitive, able to adapt to changing conditions like device position, time or other conditions retrieved from APIs. They will also provide support for user roles and will enable collaboration. Examples of rich collaborative apps include those in domains of active gaming, domotics, IoT, engineering and urban planning, among many others.

Expected results: This project proposes the use of language engineering techniques to build mobile apps, employing the novel notion of "Active DSL" developed by our team. In this approach, a domain model will be decorated with contextual rules, access control rules, graphical representation, geolocation information, collaboration approach, and external API interactions. Deployment will be possible both on mobile devices and traditional computers. While the apps we target are currently developed using traditional programming, our approach will reduce development time from months to days, with zero programming.

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 Spain 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 monthly gross remuneration will amount to €2.790 (approx.), with an extra family allowance, if applicable.

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. PhD tuition fees are fully covered.

Hosting institution

The Universidad Autónoma in Madrid is a medium-sized, public University located in the north of Madrid. UAM offers degrees in science, business, law, philosophy and arts, psychology, education, medicine and engineering. It hosts about 24.000 students, with over 550 PhD theses completed per year. The UAM campus also hosts research centers from the Spanish Research Council (CSIC). UAM is one of the top Universities in Spain in terms of teaching and research, being regularly ranked among the top four. UAM's excellence is also recognized world-wide, as it is ranked 10th in the QS ranking of Universities younger than 50 years old.

The ESR will be hosted at the Modelling and Software Engineering research group (http://miso.es), at the computer science department of the UAM, in Madrid:

> Universidad Autónoma de Madrid
> Campus Cantoblanco
> C/Francisco Tomás y Valiente, 11
> 28049 Madrid, Spain

The ESR will spend 2 secondments of 3 months at the premises of 2 project members as detailed below.

	Planned Secondments	Hosting Partner	Start – End Date
1	Collaboration with ESR6 on repository support for active DSLs	University of L'Aquila (Italy)	M15-M17 (March – May 2020)
2	Collaboration with ESR4 on Requirements and Models for Active DSLs in the IoT domain.	Intecs (Italy)	M19-M21 (July – Sep. 2020)

Supervisors

Juan de Lara, Juan.deLara@uam.es
Esther Guerra, Esther.Guerra@uam.es

Application process

All applications shall be sent before 12th April 2019 by filling in the form on the Lowcomote website: https://www.lowcomote.eu/esr/5/.

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).