

Partnering Opportunity

Profile status : Published

Research Development Request

HE-MSCA-DN-ID (Industrial Doctorate) partner search: Spanish university looks for SME with strong R&D profile in the field of IoT, machine learning or cloud technologies applied to smart cities to join an international consortium.

Summary

Spanish private university looks for SME to join a project that aims at developing an application-agnostic platform targeting smart cities for demo purposes to apply for the next HE-MSCA-DN-ID call. The partner should contribute to the design of the system specifications and to train the Early Stage Researchers contracted to carry out the research and system development. SME should have a strong R&D profile in the field of IoT, machine learning or cloud technologies applied to smart cities.

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Details

Description

GEISER project (Green Edge IoT Systems Education and Research) is an initiative that aims at developing an

application-agnostic platform targeting smart cities for demo purposes. The platform relies on cutting-edge hardware and software IoT technologies and smart sensing materials to implement ad-hoc embedded batteryless printed sensors and electronics to reduce the environmental impact and the deployment costs.

The project wants to achieve the following overall objectives:

1. Deployment of a smart and eco-friendly sensor grid with low environmental impact and integration with several Cloud and IoT technologies.
2. Implementation of effective prediction and monitoring techniques relying on embedded and edge AI.
3. Implementation of friendly user interfaces.
4. Implementation of a proof-of-concept prototype targeting emergency management in urban environments.

The following S&T barriers must be tackled:

1. The amount of data and the number of variables to consider performing the prediction is too high, thus increasing the system complexity and deployment costs.
2. Technology integration can be difficult.
3. Data privacy and security may be a concern.
4. Integration with legacy infrastructure can be challenging.

The project will generate new knowledge in the following areas: distributed machine learning algorithms for embedded and edge AI, new fabrication techniques for printable embedded electronics, new and efficient energy scavenging techniques for batteryless operation, machine-to-machine communication protocols, machine-human interfaces, machine learning and data analysis.

This project proposal will be submitted to the HE-MSCA-DN-ID programme. It is a trans-national training and networking programme with at least three main partners (at least one industrial), and a number of associated partners. Associated partners will receive no funding. The funding scheme covers the costs for contracting up to 5 predoctoral researchers and the overhead costs for the main partners. The hired researchers should carry out their research and development work under the supervision of the consortium partners.

The consortium is formed by four academic partners (from Belgium, Ireland, and Spain) and a research institute (from Spain). All the partner institutions have already collaborated in the past in several projects and have expertise in IoT technologies, real-time embedded systems design, embedded electronics, embedded AI, digital fabrication, energy scavenging, smart materials (nanomaterials, bidimensional materials, piezo and triboelectric materials, etc.) and cloud technologies.

Two industrial main partners are necessary to complete the consortium. The main duties of the industrial partners are: (i) contribute to the training of the ESRs (Early Stage Researchers) contracted within the project framework, (ii) act as the hosting secondment for the ESR during the 50% of the project duration, and (iii) participate with the other consortium members in the definition of the system specifications.

The ideal partner should be a SME with expertise in IoT and cloud technologies and, possibly, working in the smart cities market.

The call deadline is November 16th, 2021. The deadline for the expression of interest is October 10th 2021 and the project duration is 48 months (36 months funded by the EU).

Advantages and innovations

The actual solutions are still expensive and not affordable (sensor price has dropped down but it is still too high for large-scale deployments, for some application battery lifetime is still a concern and entails many issues related to environmental impact).

The potential benefit of the proposed solution is the use of low cost printed and batteryless devices that leads to a reduction of the business running costs and to a decrease of the environmental impact of the infrastructure by

reducing the use of standard silicon electronics, and by implementing circular business models based on predictive maintenance, reuse, refurbishment and refabrication of the printable hardware infrastructure.

Project development will entail the following scientific innovations: investigation on new materials and fabrication techniques for printable electronics and energy scavenging, implementation of smart grid of printed batteryless edge devices and sensors, design and implementation of edge and embedded AI algorithm for predictive maintenance of the hardware infrastructure and application specific (e.g., traffic management, crowd management etc.). Algorithms for dynamic offloading of the computation tasks to Cloud infrastructure.

In addition, the following technical innovations are foreseen: (i) Integration of several hardware, software and communication technologies into a system that must be eco-friendly and capable to seamlessly integrate in the surrounding environment, (ii) use of power constrained and batteryless cheap devices in order to keep the deployment price low while guaranteeing high performances, (iii) Implementation of a secure mechanism to guarantee data privacy and to share data among system stakeholders, (iv) development of distributed embedded and edge AI frameworks and algorithms, and (v) Implementation of suitable machine-human interfaces (this might include voice-controlled interfaces).

Stage of development

Proposal under development

IPR Status

Secret Know-how

Keywords

Technology

01002004	Embedded Systems and Real Time Systems
01002007	Nanotechnologies related to electronics & microelectronics
01003001	Advanced Systems Architecture
01003025	Internet of Things
01004003	Applications for Transport and Logistics

Market

01004003	Communications processors/network management
02007007	Applications software
02007016	Artificial intelligence related software
02007021	Other Artificial intelligence related
03001006	Controllers

NACE

J.62.0.1	Computer programming activities
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Network Contact

Issuing Partner

ZACHODNIOPOMORSKI UNIWERSYTET TECHNOLOGICZNY W SZCZECINIE

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Open for EOI: **Yes**

Dissemination

Relevant sector groups

ICT Industry and Services

Client

Type and Size of Organisation Behind the Profile

University

Year Established

1925

Already Engaged in Trans-National Cooperation

Yes

Languages Spoken

English
French
Spanish
Italian

Client Country

Spain

Partner Sought

Type and Role of Partner Sought

Two industrial main or associated partners with expertise in IoT and cloud technologies are necessary to complete the consortium.

The main duties of the industrial partners are: (i) contribute to the training of the ESRs (Early-Stage Researchers) contracted within the project framework, (ii) act as the hosting secondment (only if main partner) for the ESR during the 50% of the project duration, and (iii) participate with the other consortium members in the definition of the system specifications.

The ideal partner should be a SME with enough R&D power and resources to host the ESR and provide high-quality training and supervision during the project development. It would be advisable for the company to work in the smart city market.

Type and Size of Partner Sought

SME 11-50, SME 51-250

Type of Partnership Considered

Research cooperation agreement

Program - Call

Framework Program

Marie Skłodowska-Curie Actions

Call title and identifier

HE-MSCA-DN-ID (Horizon Europe Marie Skłodowska-Curie Actions – Doctoral Networks – Industrial Doctorate)

Anticipated Project Budget

2 million Euros approximately to

Coordinator required

No

Acronym

Green Edge IoT Systems Education and Research (acronym: GEISER)

Duration

48 days

Deadline for EOI

10 Oct 2021

Deadline of the Call

16 Nov 2021

Attachments
