

**Call for application for research scholarships
for post-graduate international candidates**

RESEARCH PROJECT N. 11

Title

Dynamic and Adaptive User Interfaces for the Internet of Things

Scientific responsible (name, surname, role)

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Short description of the research activity (max 250 words)

The increasing adoption of Internet of Things (IoT) technologies, for the creation of Ambient Intelligence systems (Smart Environments, Smart Buildings, Smart Cities) confronts the users with a multiplicity of devices, of different nature, to interact with. The current solutions adopted for interaction, such as installing multiple applications on the user own device (or, worse, all owned devices), are clearly not scalable and don't allow on-the-fly interaction with previously unknown services.

The research activity aims at conceiving new interaction paradigms in this domain, where user interfaces can be automatically generated, dynamically customized and deployed, according to real-time discovery of available IoT services, to the availability of interaction devices (own by the users, or seamlessly integrated in the environment), and considering user preferences, habits and, in general, the whole interaction context.

This kind of dynamic user interface generation will rely on a suitable semantic representation of the available services, devices, and user context and preferences, coupled with suitable reasoning or learning algorithms. The algorithms will aim at finding the right combination of devices (screens, smartphones, ...) and modalities (speech, touch, vision, AR, ...) for letting the users interact and control the available features offered by the intelligent environment. The generated interaction platform will support a cross-device paradigm, where more than one device may participate to the same use case.

The research methods would be grounded in the Human-Computer Interaction domain, starting from empirically-gathered user requirements, and will be validated through a rapid prototyping (with web and/or mobile devices) and user studies.

Specific requirements (experiences, skills)

Preferably:

Human-Computer Interaction and User-Centered Design of Interactive Systems.

Programming of user interfaces (web and/or mobile) and of distributed systems (IoT).

Artificial intelligence (knowledge representation such as semantic web, machine learning).

Website of the research group (if any)

<https://elite.polito.it/>

Keywords (min 3, max 6)

Internet of Things

Ambient Intelligence

Human Computer Interaction

Adaptive User Interface

Intelligent User Interface

User Centered Design

Research Area (max 1)

Computer Engineering