



**POLITECNICO**  
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## Supervisor Expression of Interest MSCA-IF Marie Sklodowska Curie Action-Individual Fellowship 2019

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Department Name: Research topic: ( <a href="https://www.polimi.it/en/scientific-research/research-at-the-politecnico/departments/">https://www.polimi.it/en/scientific-research/research-at-the-politecnico/departments/</a> )	Design Department Interaction design – Cultural Heritage
MSCA-IF Research Area Panels	<input type="checkbox"/> CHE_Chemistry <input type="checkbox"/> ECO_Economic Sciences <input type="checkbox"/> ENG_Information Science and Engineering <input type="checkbox"/> ENV_Environmental and Geosciences <input type="checkbox"/> LIF_Life Sciences <input type="checkbox"/> MAT_Mathematics <input type="checkbox"/> PHY_Physics <input checked="" type="checkbox"/> SOC_Social Sciences and Humanities
Politecnico di Milano Areas:	<input checked="" type="checkbox"/> Cultural Heritage <input type="checkbox"/> Smart Cities <input type="checkbox"/> Territorial Fragilities <input type="checkbox"/> Health <input type="checkbox"/> Industry 4.0
Brief description of the Department and Research Group (including URL if applicable):	<b>Department of Design</b> <a href="http://www.dipartimentodesign.polimi.it/">http://www.dipartimentodesign.polimi.it/</a>  The department conducts research and provides training and consulting services in fields ranging from intangible design to the concrete artefacts that populate our world. What sets the department apart is a combination of the following elements: the significance of design and its practices, the sharing of methods and tools, the capacity to act within the various processes of production of tangible and intangible goods, history and culture, as founding elements of design, a polytechnical approach.  <b>Interaction &amp; Experience Design</b> <a href="http://www.interactionlab.polimi.it">http://www.interactionlab.polimi.it</a> The research group holds a complementary know-how in



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	<p>the area of interaction either in the realm of sensors, embedded tools and programming software as well as designing the entire user experience in exhibits and museum applications. The research theme combines complementary knowledge to develop prototypes and projects in the broad area of interaction design, physical computing and IoT tailored to user centered design and user experience innovative products.</p>
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<p><b>Brief project description:</b> (max 1 page)</p>	<p>The interdisciplinary research aims at exploring the novel paradigm of pervasive and ubiquitous computing in the CH field, addressing the topic from the double perspective of Design (Interaction Design) and Electronic Engineering. The intertwining of design and engineering methodologies and skills is indeed key to face the complexity that today characterizes the employment of digital technologies in museums and CH sites.</p> <p>Every day, the great part of people from industrialized countries handle front-end technologies and, when involved in a visit experience, are looking for a high level of engagement. As a matter of fact, the established technology-supported visit paradigm, screen-dependent and based upon personal devices is becoming obsolete and untenable: new paradigms such as embodied and embedded interaction, characterized by the dematerialization of digital technologies and visitors' bodily engagement are taking the floor. The integration of sensing capabilities into cultural assets (being them originals, replicas or bespoke objects) or into the exhibition space (responsive environment) is still in need of deep exploration from the twofold perspective of Design and Engineering. On the one hand, design methodologies must be applied to envision future visit scenarios that move from the user and his/her needs and meaningful for curators. On the other hand, technological solutions, affordable for museums and CH institutions, and aimed at fostering a reliable, stable and seamless visit experience must be deployed. These challenges can be coped through an interdisciplinary approach able to consider the technology-supported visit experience as a whole.</p> <p>Pervasive computing and tangible interaction have emerged over the years as a way of integrating digital functionalities in the real world (Ishii and Ullmer, 1997) and comprise today a very broad range of systems and interfaces relying on embodied interaction, tangible manipulation and physical representation (of data), embeddedness in real space and digitally augmented</p>
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physical spaces (Hornecker and Buur, 2006). Tangible interaction allows people to interact with digital systems as they usually do with the physical world, namely by manipulating objects or performing gestures or bodily movements.

Together with an increased interest in the materiality of the visit experience in museums and cultural institutions more generally (Chatterjee, 2008; Dudley, 2012; Pye, 2008), tangible interaction is progressively entering the cultural heritage field through systems such as tangible tabletops (Hsieh et al., 2010) smart objects (Rawat, 2005) and smart physical places (Ciolfi and Bannon, 2005). Although these systems have different shape and aims, they all offer interactions based on the manipulation of tangible, sensorised objects (object-based interaction) or free bodily gestures and movements (gesture-based interaction) (Spallazzo & Ceconello, 2017).