## Scholarships and Financial support

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monthly net income of PhD scholarship (max 36 months)</td>
<td>€ 1,132.72</td>
</tr>
<tr>
<td>(In case of a change of the welfare rates during the three-year period, the amount could be slightly modified)</td>
<td></td>
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<tr>
<td>Increase in the scholarship for stays abroad</td>
<td>€ 566.36 per month, for up to 6 months</td>
</tr>
<tr>
<td>Number of scholarships</td>
<td>1 (one)</td>
</tr>
<tr>
<td>Beginning of PhD</td>
<td>1 May 2020</td>
</tr>
<tr>
<td>Deadline for application</td>
<td>6 March 2020</td>
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</table>

## Context of the research activity

**Motivations and objectives of the research in this field**

Modern surveying techniques that generate point clouds allow you to create a virtual reality much more accessible than traditional models. The point clouds can be used with new technologies and modern devices to share information in augmented reality (AR) environments. Depending on the level of information that is shared, it is possible to range in different areas and sectors of activity, primarily technical and tourist.

At a technical level, this information can support the management of the maintenance process aims to prevent degradation in a heritage building or archaeological park.

In the tourism industry, it is possible to guide the visitor step by step through the site.
step to discover the cultural heritage interactively, to become himself an actor in the process of data and information acquisition.

**Methods and techniques that will be developed and used to carry out the research**

The research project aims to use all the modern surveying techniques to create virtual and shared environments enhanced by computer-generated information: both surveying and technical, and more generally of the characteristics of the object investigated (historical building, monumental complex, archaeological site).

It is, therefore, necessary to integrate cutting-edge technologies and traditional information to create a virtual and interactive environment to discover the Italian cultural heritage.

As for augmented reality on a mobile device, a smartphone with a Global Positioning System, a magnetometer (compass) and internet connection for receiving data online is required.

By framing the surrounding environment in real-time, the visitor has access to content levels superimposed on the real world point cloud through Points of Interest (POI) geolocated by three-dimensional elements.

**Educational objectives**

The figures that come into play are different. The architect's contribution is undoubtedly that of making his knowledge of architectural and archaeological assets available, both from a cultural and from a technical design point of view.

Once the object has been investigated, studied, and detected, it is necessary to make one's knowledge available to third parties, together with the survey.

The educational objective is to transfer this way of working in the conservation laboratories (three-year and masters) to make this process a sort of work standard.

**Job opportunities**

The topic to be developed is of great interest to the tourist enjoyment of most of the architectural and archaeological heritage in Italy and the world. The development of fruition devices is advancing at an incessant pace with technology, but the creation of fruition environments and above all the related contents and exploration priorities is a sector where the architect, together with the historian, must and can make a substantial contribution.

Furthermore, especially in Italy, the design and construction phases in particular architectural and archaeological sites should be set up on cloud environments with augmented reality structures, a bit as happens for BIM environments, without necessarily going through the creation of the model of the object (without going through virtual reality).

The research sector can also be developed as operational support to Facility Management in advanced environments as a link to the entire Internet of Things sector.

**Composition of the research group**

- Number of Full Professors -
- Number of Associated Professors 1
- Number of Assistant Professors -
- Number of Post-Docs -
- Number of PhD students -
- Number of contracted researchers -

**Names of the research directors**

*Prof. Franco Guzzetti*

**Contacts**

*bandi-phd-dabc@polimi.it*
## Additional support

<table>
<thead>
<tr>
<th>Housing: financial aid per PhD student per year (gross amount)</th>
<th>No financial aid will be given for housing.</th>
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</thead>
</table>

**Additional information:** educational activity, teaching assistantship, computer availability, desk availability, any other information

**Additional support:** Additional support: Budget for the research activity: total amount € 3,068.66 per student

In detail:
- 1st year € 0.00
- 2nd year € 1,534.33
- 3rd year € 1,534.33