“Campus Architettura PoliTO” project: WebAR for public engagement

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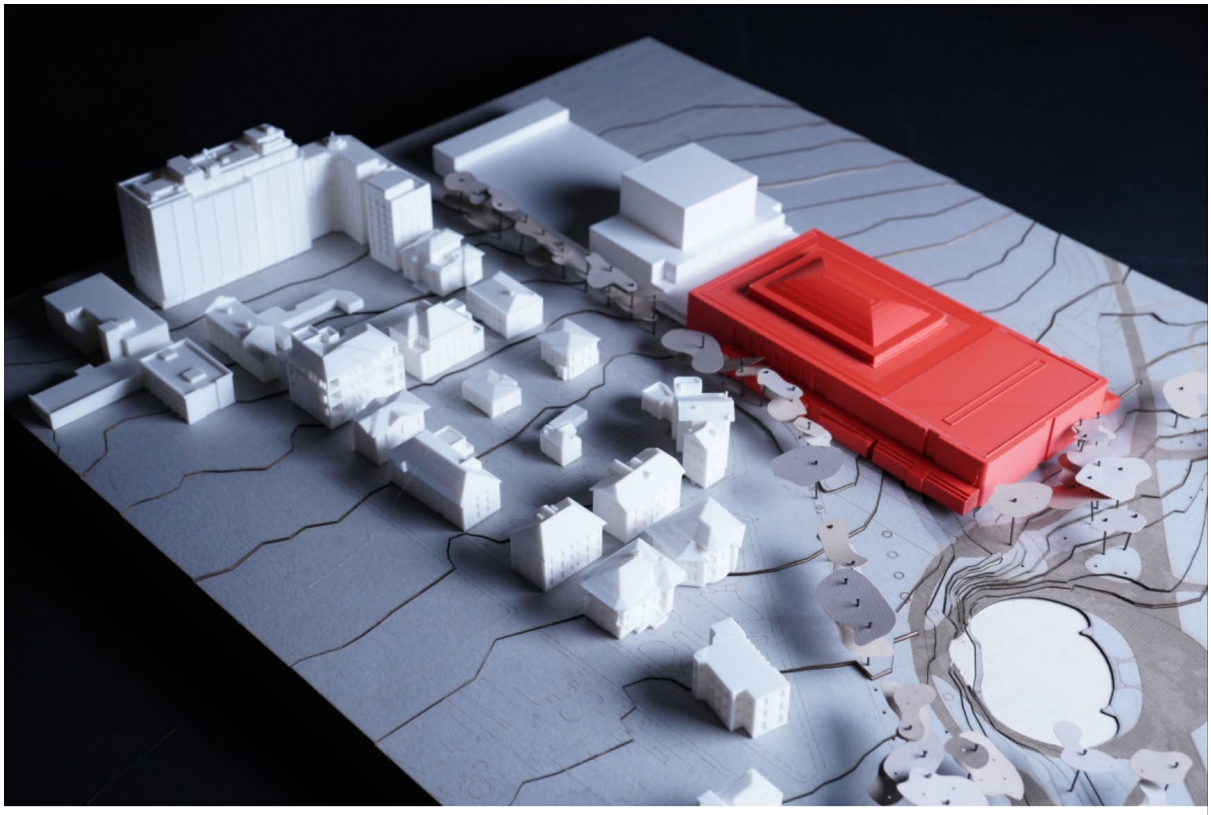
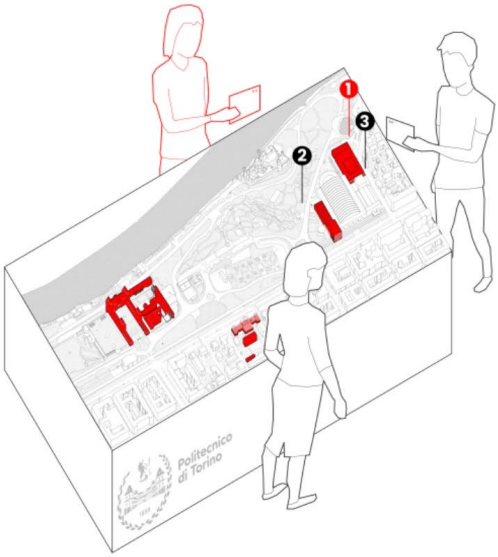
Abstract

The design of the Politecnico di Torino Architecture Campus has an enormous strategic value: both for the reorganization of the University, allowing the reunion in a single place of the teaching, research and third mission activities of the areas of Architecture, Design and Planning, dispersed in the 1990s due to insufficient space; and for the city dynamics, contributing to the overall development of the Po cultural axis. In fact, the Campus is developed in the historic Valentino Park, with the the Castle, a UNESCO World Heritage Site (first seat of the Politecnico), and the under renovation Torino Esposizioni complex, a masterpiece of modernism signed by Ettore Sottsass Senior and Pier Luigi Nervi, restored through great attention and innovation.
The transformation will have a huge impact on the life of the area, radically changing its intensity with daily flows of thousands of people, and making the park a true natural connective tissue.
The communication project includes the realization of events aimed at presenting the campus with the purpose of disseminating and popularizing the outcomes of the realization process to different stakeholders.
Currently, MODLab Arch is involved in the digital fabrication of the plastic model of the campus, set in the urban and environmental context, which realization flanks and follows the design activities of the University Masterplan group.
The creation of the model, at a scale of 1:500, involves the techniques of laser cutting for the base and trees, and FDM 3D printing for the buildings. From a communicative point of view, the colors allow the campus buildings to stand out from the context buildings and highlight the area affected by the intervention (park and connections between the buildings), while the use of hatches in the laser engraving operations allows to hierarchize the paths and differentiate the uses of the project areas.
Among the innovative features of the communication proposal is the superimposition of digital layers on the physical model, for audience engagement through a webAR that activates a step-by-step journey with descriptions of different aspects of the campus project.
The adoption of web augmented reality (webAR) offers advantages in terms of accessibility and ease of use. WebAR allows access to the AR experience directly through a web browser, eliminating the need to install specific applications. This promotes the engagement of a diverse audience by facilitating interaction with the plastic model via smartphones.
The webAR can leverage two-dimensional markers and QR codes placed around the model, each of which activates a digital integration in AR that is intuitive, interactive, and detailed (Amin and Govilkar, 2015).
Through the use of languages such as HTML, CSS, and JavaScript, webAR enables rapid development and low cost (Shepiliev et al., 2021). In addition, compatibility with many web browsers and devices

ensures that it can be used by a wide range of users. The choice of software to adopt fell on AR.js, an open-source library in JavaScript.
Although versatile compared to native AR solutions, webAR has limitations in stability, graphical rendering and interaction possibilities, which should be considered when designing the installation.
In particular, AR.js does not support extended tracking features, and thus proper anchoring of digital layers requires that the marker remain in the camera's field of view (Nguyen et al., 2020).





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