

An approach to the transformation of point clouds into historical building information modeling models. Case of Study: Quincy Smelter in Ripley, Michigan

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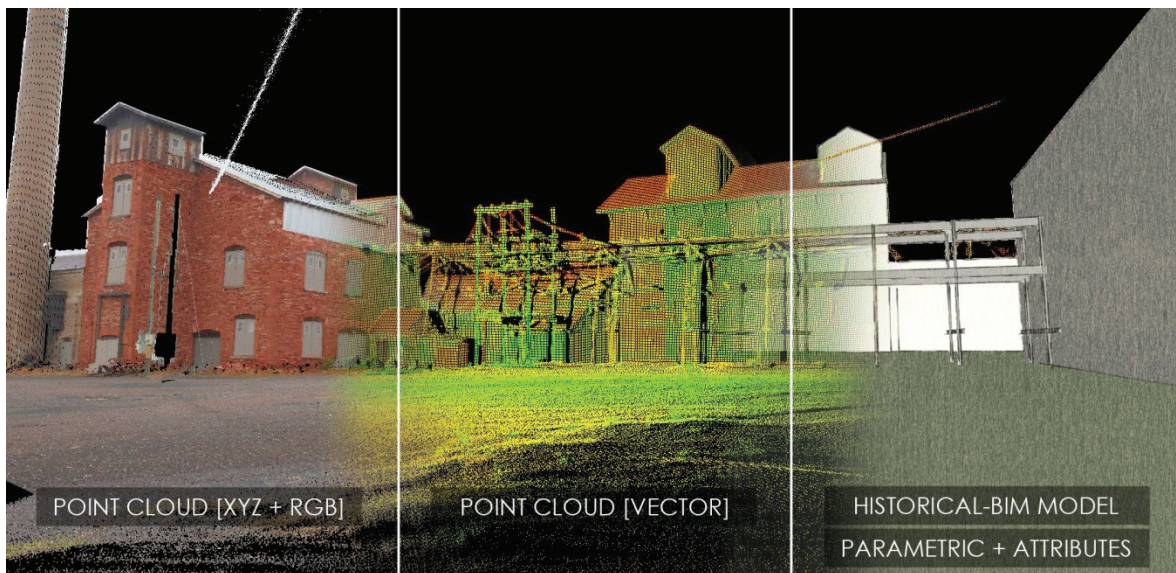
Abstract (2000 caracteres)

Insofar as our cultural heritage has become not only an economic resource but a key element in defining our identity, its accurate and flexible documentation, has emerged as an essential task.

The generation of 3D information with physical and functional characteristics is now possible through the connection of survey data with Historical Building Information Modeling (HBIM). However, few studies have focused on the semantic enrichment process of models based on point clouds, especially on the field of cultural heritage.

These singularities make the conversion of point cloud to "as-built" HBIM an expensive process from the mathematical and computational viewpoint. At present, there is no software that guarantees automatic and efficient data conversion in architectural or urban contexts.

The purpose of this paper is to discuss the different approaches to date on the HBIM generation chain: from 3D point cloud data collection to semantically enriched parametric models. The critical analysis will particularize in two current processes of feature identification in point clouds data: (1) automatic segmentation based on grammar context, and (2) the inverse procedural modeling throughout the design and plotting of parametric objects. Finally, a demonstration section, based on the industrial heritage site of Quincy Smelter in Michigan will objectively show advantages and disadvantages of the different aforementioned approaches.



Summary figure: From point cloud to BIM at the Quincy Smelter in Ripley, Michigan