

CONCEPTUAL DESIGN OF FOOTBRIDGES THROUGH PARAMETRICS: BEYOND THE FROZEN GEOMETRY

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Summary

Today, it is unquestionable of the enormous changes produced in engineering due to advances in the computational field. Among all these advances, parameterization may have been one of the most influential in structural engineering: parametric design tools have gone from being seen almost as an extravagance, to being part of the usual workflows of many companies today.

The complete integration of the parameterization from early design phases provides not only an improvement from the practical point of view (workflow improvement), but also allows greater control and understanding of the existing constraints, which should serve as a driving force for creativity. From this point of view, the engineer does not propose a single geometry, but a design strategy that encompasses, through parameters, the conditions that govern the problem. It is, therefore, the sensitivity of the designer and his ability to interpret and implement the conditions of the problem, which will ultimately determine the suitability of the space of solutions obtained.

The integration of parametric tools in the design process is shown through two different projects: Arkaiate footbridge (Vitoria, Spain) and the Bidegorri footbridges between Azitain and Maltzaga (Eibar, Spain). The parametric design approach in both projects has allowed generating designs that are fully adapted to the particularities of each structure, although a common generative strategy has been used for all of them.

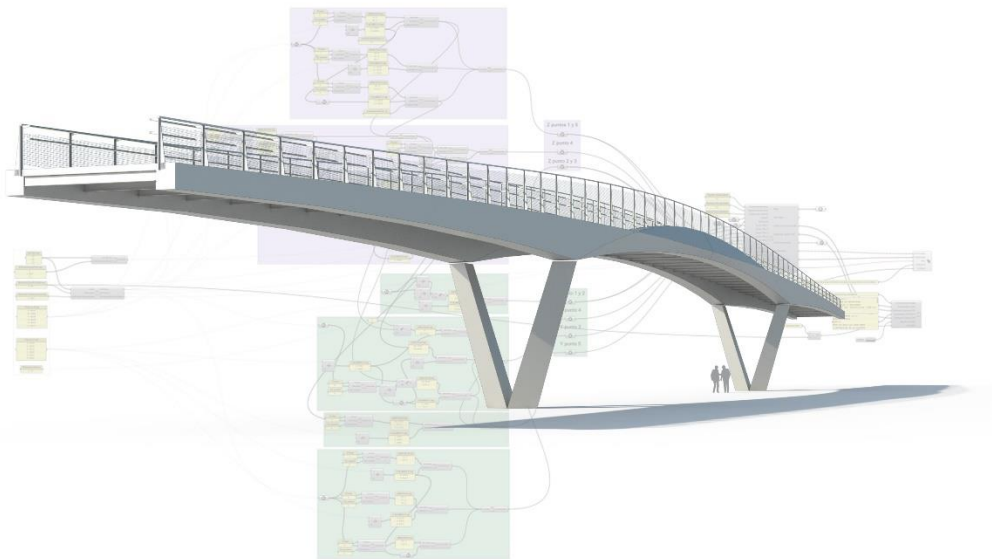


Fig. 1. Design of Arkaiate footbridge (Vitoria, Spain) including the computational workflow used to define the geometry using parametrics

Keywords: design; parametric design; structural concepts; computational; footbridge; Computer-Aided Engineering.