

*International Doctorate in Civil and Environmental Engineering*

## **Mechanical Modelling of Irregular Masonry**

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Abstract
<p>The assessment of the structural response of masonry is a complex subject, because of some peculiarities that characterize this construction technique, and is still under research. The mechanical response of masonry depends on the mechanical properties of its components, mortar and bricks/stones, and also on the masonry typology, which is defined by the geometrical properties of the components and their arrangement inside the structure. While the influence of the mechanical properties of the components is relatively well studied, the role of the masonry typology is usually evaluated only through experimental tests. However, the high cost of the experiments represents a limit for the in-depth study on this topic. Numerical simulation is an effective tool to enlarge the field of investigation beyond the experimental tests.</p> <p>The research project focuses on the assessment of the mechanical behaviour of irregular masonry through numerical analyses, with the goal of study the effects of the geometrical parameters, e.g. the size and shape of the stones, which define the masonry typology. Firstly, a computational tool for the parametric generation of specific irregular masonry patterns is developed. In the second part, numerical simulations of experimental tests are performed by varying the geometrical parameters of the masonry texture to assess their influence on the mechanical response.</p>