Editorial

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Biographical notes: Giovanni Castellazzi is an Associate Professor in Mechanics of Solids and Structures in the Department of Civil, Chemical, Environmental and Materials Engineering at University of Bologna and Deputy President of Italian Association of Composites for Civil Engineering applications. He was a Post-doctoral Fellow at the University of California San Diego (UCSD) and completed his PhD in Structural Mechanics at University of Bologna. His research interests lie broadly in the field of computational mechanics but are primarily focused on the area of masonry structures: from coupled models for the study of mechanical degradation of porous materials to computational tools for the seismic assessment of masonry structures.

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Historic and architectural heritage in many countries worldwide mainly consists in masonry buildings. As it is well known, many of these buildings are vulnerable to natural disasters such as earthquakes, floods and landslides. For this reason, there is an urgent need to upgrade and improve historic building structural performance as well as safety.

Although extensive research has been devoted to address such aspects, several issues regarding proper theoretical and computational approaches are still persisting.

The aim of the special issue is to discuss open issues, challenges, and achievements in analytical, experimental and numerical modelling as well as in the fields of NDT and SHM applied to historic masonry structures.

The special issue is divided into two parts.

This first part consists of nine papers. The papers: ‘A new non-invasive method for the seismic retrofit of rubble masonry using composite connectors’ by de Felice et al. and ‘Experimental and numerical procedure for vulnerability assessment of historical masonry building aggregates’ by Boscato et al. deal with experimental testing on masonry structures.

The papers: ‘Structural health monitoring of a masonry arch bridge: modal identification and model updating’ by Zini et al. and ‘Garisenda Tower in Bologna (Italy): health monitoring by different non-destructive testing techniques’ by Di Tommaso et al. deal with SHM approaches applied to masonry structures.

The papers: ‘Out-of-plane seismic response of a masonry façade using distinct element methods’ by Schiavoni et al., ‘Masonry arches simulations using cohesion parameter as code enrichment for limit analysis approach’ by Nela et al., ‘Modelling of in-plane strengthening of unreinforced masonry buildings: a numerical comparison between traditional and FRCM jacketing’ by Sbrogiò et al., ‘Dynamic characterisation and numerical model updating of a historical complex’ by Standoli et al. as well as ‘Non-destructive testing and historic building information modelling for the structural diagnosis of the church of the society of Jesus in Cusco, Peru’ by Reategui et al. are concerned with numerical and theoretical modelling of masonry structures.