Editorial

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This special Issue is a collection of some of the top papers submitted to the 1st International Conference on Natural Hazards (ICONHIC2016) and Infrastructure which took place in Chania, Greece from 28-30 June 2016.

Natural disasters, such as the 2008 Midwest floods and Katrina and Sandy Hurricanes in the United States, the earthquakes in Sichuan, China, the Canterbury earthquakes in New Zealand, and a host of similar recent natural disasters have all highlighted the vulnerability of even modern infrastructure to natural hazards. Protecting infrastructure from extreme events calls for an integrated approach to hazard assessment considering the correlated nature of natural hazards, cascading hazards and cascading effects. In a world of increasingly interdisciplinary research this conference brought together specialists from different scientific fields in order to promote "out of the box" thinking and cross-fertilization.

ICONHIC2016 has been the first major international event to discuss the major issue of bringing up a common strategy for the protection of our infrastructure against all natural disasters. The delegates, speakers and attendees, represented 22 countries, 90 research centers and 65 companies from all over the world. The conference hosted 15 parallel sessions, 2 mini-symposia, 14 keynote and invited talks and the first of its kind 5-in-5 session. The latter consisted of parallel 5-minute presentations in 6 bays moderated by a single panel, thereby offering delegates the option to consecutively join several bays and be able to attend presentations of several subjects within a very short timeframe.

This issue of the Case Histories Journal includes a selection of papers submitted to the conference, which were deemed eligible for the special session and have afterwards gone through additional rounds of review by the Journal's panel of reviewers ensuring their compliance with its high quality standards.

The papers included in this issue represent an ensemble of the topics discussed during the conference:

The first paper by Foteinis et al. deals with one of the major hazards for coastal infrastructure using the old Venetian Harbor of our host city, Chania, as target for its case study. The harbor of Chania is exposed to wave storms of significant magnitude crossing the Aegean and Cretan Seas which frequently affect its aging docks. Associating hydrodynamic modeling with field measurements, this study evaluates the functionality/effectiveness of the existing offshore breakwater as well as a proposed new one. Possible integration of the quite necessary new breakwater with a wave energy harnessing system is suggested by the authors as an ideal solution which combines coastal defense with renewable energy production.

The second paper by Taylor et al. highlights the interdisciplinary essence of modern natural disaster protection strategies, which is the cornerstone idea of ICONHIC2016. Based on the vast amount of field data collected after the 2010–2011 Canterbury Earthquake Sequence, this study introduces a new, interrelated hazard: increased flooding vulnerability caused by the seismically induced subsidence of land. The paper elaborates upon the lessons learned and the challenges faced during the different stages of the damage assessment process with regard to mapping technologies, flood modeling methods, data processing as well as communication with stakeholders and the public.

The work of Zekkos et al. is included in recognition of the essential role of accurate and readily available (damaged) land mapping methods evolving rapidly nowadays thanks to the growth of Unmanned Aerial Vehicle technology. Their paper demonstrates applications of Structure-from-Motion photogrammetry for the purpose of generating high-resolution 3D

Reference: Gazetas, G. and Kourkoulis R. (2018). Editorial. International Journal of Geoengineering Case Histories, Vol.4, Issue 4, p. 230 - 231. doi: 10.4417/IJGCH-04-04-00.

images of different sites with various geotechnical characteristics. The presented methodology is shown to provide a powerful surveying tool while at the same time being relatively inexpensive in comparison to alternative methodologies that generate similarly accurate data.

The following two papers address the seismic hazard with emphasis on seismic isolation. Alexakis and Makris study and compare the responses of the single-nave barrel vault and the rocking frame, the two most common masonry structural systems used to bridge a span. Their paper pinpoints the possible failure mechanisms for each system with respect to their slenderness ratio. Revealing the inarguably advantageous performance of the rocking frame, it advocates for the concept of rocking isolation. From a different point of view, which involves modern structural design, Sapountzakis et al. explore the virtues of a novel passive vibration isolation and damping device, entitled KDamper. Based on the incorporation of a negative stiffness element, this device is shown to improve the frequency characteristics of the structure thereby acting as seismic isolation.

Despite being focused on the seismic hazard and making reference to the case of motorways, the last paper by Anastasopoulos et al. is in fact an introduction to a methodology for real-time assessment and emergency response which has the potential of being expanded and adapted to consider various types of infrastructure and/or hazards. Their study provides an overview of a recently developed framework, which enables rapid seismic assessment of bridges, and presents its pilot application in the Attiki Odos Motorway in Athens, Greece.

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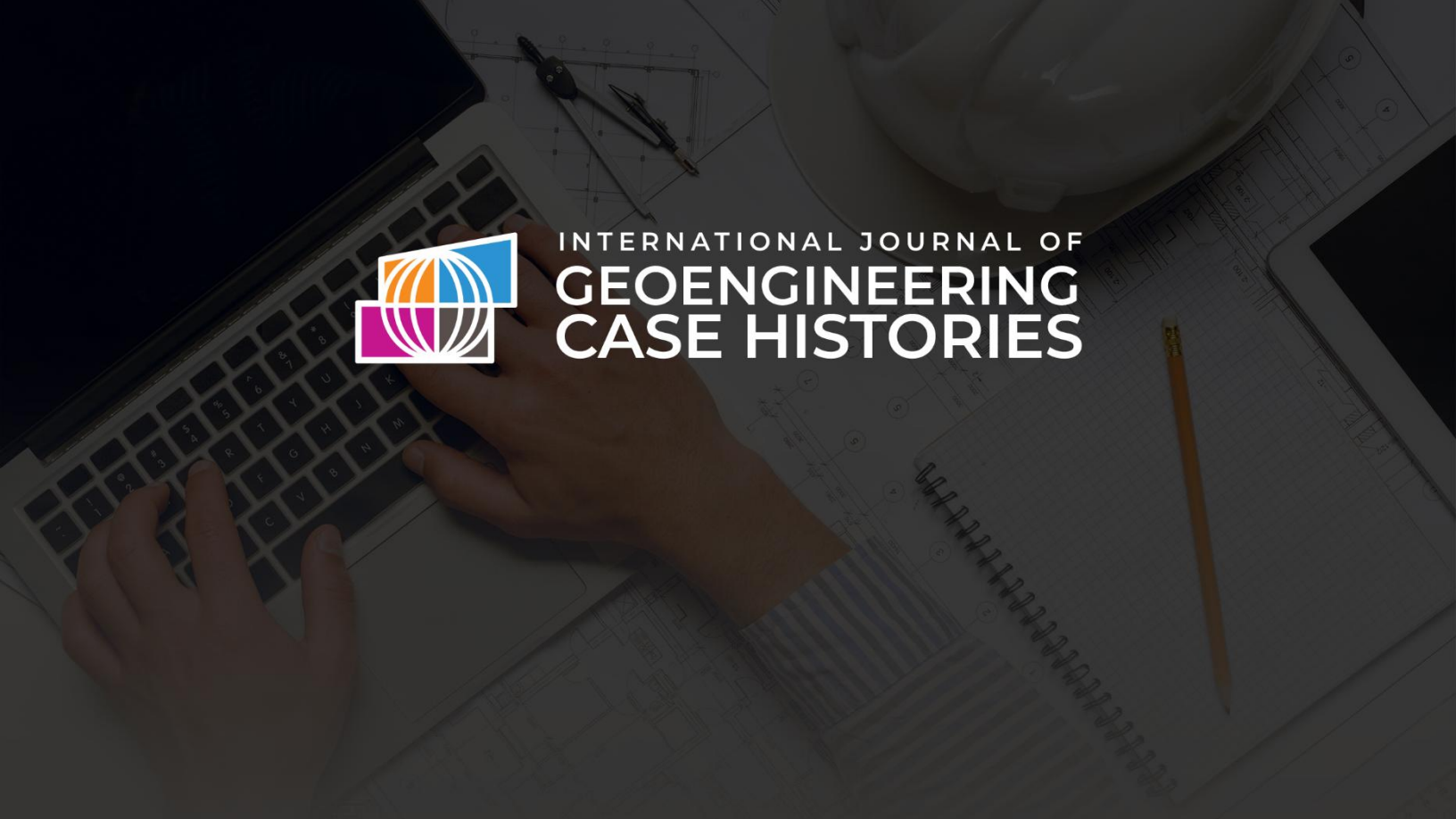
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