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Editorial
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Editorial

John Owen BENG, PhD, CEng, FICE, MInstP
Associate Professor, Department of Civil Engineering, University of Nottingham, Nottingham, UK

This issue of *Engineering and Computational Mechanics* typifies the scope of the journal. Papers present applications and fundamentals, consider solid and fluid mechanics, use new technological platforms, and address the needs of designers, researchers and students. With such a breadth of material it is easy to ignore papers that don't immediately match our interests; that would be folly, as even a brief review of the abstracts reveals.

Åkesson and Lindemann (2016) address the need for conceptual design tools that are more than just sketchpads. Designers need to be able perform calculations on the fly and interact with potential design solutions in much shorter timescales than traditional detailed computational models. The authors exploit the ease of interaction of the latest tablet technology to create an interactive application that embeds robust computational mechanics. Robust mechanics is important because it is easy to be fooled by impressive graphics without a sound foundation. Although this application is presented as a conceptual design tool, its greatest impact could be in teaching structural engineering, enabling students to interact with structural systems and develop a feel for structural behaviour.

In contrast to the high level conceptual design of Åkesson and Lindemann (2016), Liao and Huang (2016) consider the detailed numerical modelling of concrete fracture. They present an application of the extended finite element method (XFEM) that includes a bespoke model of the bond between rebar and concrete. This approach allows Liao and Huang (2016) to produce predictions of crack localisation, length and width that compare well with validation tests in both flexure and shear, the bespoke bond model being critical to achieve good simulations of crack patterns, and crack opening. This level of detailed analysis is very much aimed at specialist applications and so the paper will be of greatest interest to engineers that are tackling problems with concrete cracking, and other researchers. It would be a useful read for any PhD students attempting to write their own XFEM code.

The third paper in this issue (Wang *et al.*, 2016) addresses the timely problem of micro-pressure waves generated by high-speed trains in rail tunnels, which are a potential source of noise. Wang *et al.* (2016) present an efficient axi-symmetric computational fluid dynamics (CFD) model of the problem and use this to study the effects of changes to the form of the exit regions of tunnels. The authors evaluate the effects of various design modifications (e.g. length of exit region and perforations) on the amplitudes of micro pressure waves. The paper shows how the greater efficiency of the axi-symmetric simulation can be used to evaluate a larger number of design concepts, but acknowledges the need for more accurate 3D models for the final detailed design. This paper will be of interest to those working in high-speed rail and tunnel designers as well as those working on applications of CFD.

These three papers show computational mechanics are being used to tackle problems in different fields, at different levels of detail and using different technologies. Yet, they each show how computational mechanics can inform engineering practice. Comments and discussions are strongly encouraged, as are contributions from your own work.

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