Editorial

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Modelling and simulation has become a pillar in engineering and has been used as predictive tool in countless applications and branches. Thanks to the vast amount in computational science, materials science and - correspondingly - hardware (Andalso software) technology, we can tackle nowadays a much larger variety of problems. However, models in engineering – and also materials science – are therefore faced with the challenge of growing complexity. Building and solving them needs increasingly interdisciplinary skills. However, as the scale and complexity of problems to be solved in engineering already exceed what the human mind is capable of deciphering, the need to utilise built-in efficient algorithms and simulations and decision support systems will continue to grow. The objective of this SI is to provide an overview of state-of-the-art machine learning methods and its application in engineering. This special issue presents contributions on ML approaches and other advanced computational methods including the boundary element method and their application to challenging problems in engineering such as piezoelectric wave energy converters, state-of-the-art composite materials and self healing concrete covering therefore a wide area. In this context, machine learning approaches like deep neural networks have been used as surrogate model or directly as solver to partial differential equations. Finally, we believe that this SI gives a comprehensive overview of state-of-the-art machine learning and computational methods for challenging engineering applications. The organisers of this SI would like to thank all the authors contributing to this SI and the editorial board for this opportunity.