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DATA-BASED ENGINEERING & COMPUTATIONS

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ABSTRACT

Engineering is evolving in the same way as society. Nowadays, data is earning a prominence never imagined before. In the past, in the domain of materials, processes and structures, testing machines allowed the extraction of data, which served in turn to calibrate state-of-the-art computational models. Some calibration procedures were even integrated within testing machines. Thus, once the model was calibrated, computer simulation took place. However, data can offer much more than a simple state-of-the-art model calibration, and not only from its simple statistical analysis, but from the modeling and simulation viewpoints. This gives rise to the family of so-called digital twins, also known as virtual and hybrid twins. Moreover, not only data can serve to enrich physically-based models. These could allow us to perform a tremendous leap forward, by replacing big-data-based habits by the incipient smart-data paradigm.