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DEVELOPMENT AND APPLICATIONS OF COMPUTATIONAL METHODS FOR DIGITAL TWINS

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ABSTRACT

Digital twins are virtual representations of physical objects, systems, or processes that allow for real-time monitoring, analysis, and simulation. Essentially, they are digital replicas used to model and optimize the behavior and performance of the physical asset. Regardless of challenges and limitations in their full deployment and implementation in real practice, there seems to be only one school of thought and a consensus toward the future adoption of Digital Twins for design, construction, management, operation, and decommissioning of assets among the scientific community and practitioners [1]. Current research gaps in the practical development and implementation of Digital Twins are mainly related to: (i) the lack of interoperability among the different proprietary and open-source software used along the Digital Twin model generation pipeline; (ii) performance improvement of currently available anomaly detection, location, description, and prognosis algorithms; and (iii) the direction for the creation of macro-digital twins that integrate Digital Twins of individual assets. Furthermore, future potential developments on this topic are related to the implementation of Industry 5.0 concepts and ideas within Digital Twin frameworks such as sustainability, human-centrism, and resilience [2].

Contributions aiming at tackling any of these issues by means of novel developments and applications of computational methods are welcome to participate in this mini symposium. Either basic methodologies, scientific developments and/or industrial applications are equally accepted.

REFERENCES

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