SCIENTIFIC MACHINE LEARNING - A CATALYST FOR ALGORITHMIC PERFORMANCE IN INDUSTRIAL COMPUTER AIDED ENGINEERING

600 - DATA SCIENCE, MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE

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ABSTRACT

This mini-symposium centers on the profound role of Machine Learning (ML) technologies in amplifying computational performance of simulation tools, a critical determinant in the advancement of Computer Aided Engineering (CAE) in the industrial sector. In the last years, it has been demonstrated through various Proof of Concepts that ML can significantly enhance the computational performance of solvers, in areas ranging from computational fluid dynamics to system simulations. However, the application of these technologies in real-world contexts and industrial workflows presents a unique set of challenges.

Hence, this symposium aims to delve into specific ML methods uniquely tailored for tangible applications, focusing on attributes such as error guarantees, minimal data requirements, potent extrapolation capabilities, and competitiveness compared to existing solvers. Contributions will be presented along real-world challenges and applications benchmarked along state-of-the-art industrial technologies.

We will conclude the mini symposium with a small panel discussion on required future research directions for ML solutions boosting industrial computer aided engineering.

CONFIRMED SPEAKERS

- Peter Benner ([Max Planck Institute for Dynamics of Complex Technical Systems](), DE)
- Amit Chakraborty ([Siemens](), USA)
- Felix Dietrich ([TUM](), DE)
- Mengwu Guo ([U Twente](), NL)
- Alexander Heinlein ([TU Delft](), NL)
- George Karniadakis ([Brown](), USA)
- Alexander Lavin ([Pasteur & ISI](), USA)
- Gianluigi Rozza ([SISSA](), IT)
- Benjamin Sanderse ([Centrum Wiskunde & Informatica](), NL)
- Wil Schilders ([TU Eindhoven](), NL)
- Stefan Turek ([TU Dortmund](), DE)