

Advances in mesh generation and adaptation for CFD

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ABSTRACT

Despite the maturity of many mesh generation and adaptation algorithms, the NASA CFD Vision 2030 report [1] highlighted several issues that are still affecting the mesh generation stage. These issues include efficiency, robustness, and a better coupling with the ever-increasing complexity of CAD models [2]. In addition, research in mesh generation is usually driven by the needs of new applications and/or novel solvers. As a result, computational techniques normally reach a high level of maturity before robust and efficient mesh generation techniques meet their requirements [3].

This session aims to create a forum for researchers to present the latest developments in the broad field of mesh generation and adaptation. Topics that fall within the remit of this minisymposium include, but are not limited to:

- Mesh generation and adaptation for novel CFD algorithms
- Improved integration of geometry and mesh generation
- Mesh and degree adaptivity
- Mesh deformation and morphing
- High-order mesh generation
- Mesh quality improvement
- Mesh optimisation
- Mesh generation for Exascale
- Mesh generation using artificial intelligence
- Hexahedral and Hex-dominant mesh generation

REFERENCES

- [1] J.P. Slotnick, A. Khodadoust, J. Alonso, D. Darmofal, W. Gropp, E. Lurie and D.J. Mavriplis, *CFD vision 2030 study: a path to revolutionary computational aerosciences*, 2014.
- [2] M. Gammon, H. Bucklow, R. Fairey, *A review of common geometry issues affecting mesh generation*, AIAA Aerospace Sciences Meeting, 2018.
- [3] R. Sevilla, S. Perotto and K. Morgan, *Mesh Generation and Adaptation: Cutting-Edge Techniques*. Springer Nature, 2022.