

# SOPTX: A Modular and Extensible Framework for Topology Optimization with Multi-Backend Support

Liang He<sup>1</sup>, Huayi Wei<sup>1,2,\*</sup>, and Tian Tian<sup>3</sup>

<sup>1</sup>School of Mathematics and Computational Science, Xiangtan University, Xiangtan 411105, China

<sup>2</sup>National Center of Applied Mathematics in Hunan, Hunan Key Laboratory for Computation and Simulation in Science and Engineering, Xiangtan 411105, China

<sup>3</sup>School of Mathematics and Computational Science, Xiangtan University, Xiangtan 411105, China

**Running Head:** SOPTX: A Framework for Topology Optimization

**AMS Subject Classifications:** 74P15, 68N30, 65N30

**Keywords:** Topology Optimization, Multiple Computational Backends, Automatic Differentiation, Modular Framework

## Acknowledgments

This work was supported by the National Natural Science Foundation of China (NSFC) (Grant Nos. 12371410, 12261131501) and the Construction of Innovative Provinces in Hunan Province (Grant No. 2021GK1010).

---

\* Corresponding author.

Email address: [weihuayi@xtu.edu.cn](mailto:weihuayi@xtu.edu.cn) (Huayi Wei)