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Machine learning-assisted structural optimization

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Summary: Structural optimization, which devotes to designing lightweight products subject to performance constraints, has qualified as an important tool in engineering applications involving material design. The approach is generally classified into three groups: sizing, shape, and topology optimization. Recently, machine learning-assisted structural optimization has gained ever increasing attentions in both academic and industrial aspects. Along with huge engineering potentials, new challenges also emerge when machine learning technique is combined with structural optimization. This session will explore how machine learning can be used to enhance structural optimization. Topics of interest include but are not limited to:

➢ Applications of machine learning in structural optimization
➢ Integration of machine learning in optimization algorithms
➢ Machine learning techniques for surrogate modeling and optimization
➢ Multi-objective optimization with machine learning
➢ Uncertainty quantification in machine learning-assisted optimization
➢ Robust design optimization with machine learning
➢ Data-driven design of multi-function structures
➢ Machine learning for optimization of nonlinear systems