Control Co-design Optimization Of A Floating Offshore Wind Turbine Blade Using A Multi-objective Genetic Algorithm

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INTRO
• The design of the rotor blades critically effects the overall performance of the wind turbine.
• Optimizing the structural and control parameters can improve the overall performance of the wind turbine.
• Different sub-systems of a floating offshore wind turbine are highly coupled, so an optimization approach that considers the interaction between these sub-systems is required.

METHODS
1. Developing a multi-objective optimization framework.
2. Design and development of numerical simulations for evaluating wind turbine performance.
3. Design and execution of experimental studies using a wind tunnel to validate the proposed design.

RESULTS
• A parametric analysis is conducted using the parameterized blade model
• The optimal configuration for blade distributed properties is obtained.

DISCUSSION
• A multi-objective optimization framework is developed.
• Experimental setup for wind tunnel is designed and tested.

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