

Nonsmooth Problems with Applications in Mechanics
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**Multiobjective Optimization for Computationally Expensive Problems
with Applications in Hydraulic Pump Design**

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Abstract: Real-world problems bring several challenges in optimization such as multiple conflicting objectives, high computational costs, and simulation failures. This contribution is focused on multiobjective optimization in the pump industry. The considered hydraulic pump design problem involves computationally expensive CFD simulations which limit the number of possible evaluations needed for successful optimization. Therefore surrogate models are utilized in the solution process to reduce the computational time. On the pump design problem, we demonstrate the potential of surrogate-assisted evolutionary multiobjective optimization methods to tackle the challenges and thus efficiently solve real-world problems.