

IWR COLLOQUIUM SUMMER SEMESTER 2024

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Robust Optimization Approaches for PDE-constrained Optimization under Uncertainty

The consideration of uncertainty in optimization problems is an important aspect in practical applications. In this talk we consider optimization problems with PDE constraints, where uncertainty occurs in parameters and in the optimization variables.

We focus on robust optimization approaches. Here, the uncertain variables are described by an uncertainty set and it is required that the optimization variables satisfy critical constraints for all realizations in the uncertainty set. In distributionally robust optimization one considers an ambiguity set of relevant distributions.

We present various techniques how to approximate and reformulate the robust problem by using optimality conditions and duality theory and discuss suitable solution methods. Moreover, we illustrate how adjoint techniques, model order reduction and error estimation can be used to reduce computational costs. We present application examples, in particular the design optimization of electric machines under uncertainty.

**Also streamed
via Zoom**



July 10, 2024 • 16:15

Mathematikon • Conference Room / 5th Floor
Im Neuenheimer Feld 205 • 69120 Heidelberg
www.iwr.uni-heidelberg.de/events/iwr-colloquium

HGS MathComp Mixer

Prior to the IWR-Colloquium: Get-together for all members of the HGS MathComp
15:30 • Mathematikon • Common Room / 5th Floor