

# Project idea: Surrogate Models for Optimization

## Call area: Optimization of Design Approaches

### Contact

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### Project Description

In order to optimize design approaches, one needs to provide:

- a parameterization
- a forward simulation
- an objective function
- an optimization algorithm

### Project Objectives

- Define hybrid surrogate models for the forward simulation based on a combination of physical models and experimental data

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### Problem, State of the Art, and Envisioned Solution

**Numerical design optimization** is a **many-query** scenario, meaning that it relies on a **large number of numerical simulations** that need to be evaluated for different parameter configurations. In order to make this feasible, **surrogate models** can be employed instead of the forward simulation. Important methods on how these surrogate models can be generated are **operator projection approaches, machine learning, or regression**.

We envision to develop a problem-specific method for a surrogate model in a design context.

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### Our Partners, Our Know-How...

- numerical optimization
- surrogate models
- problem-specific shape parameterizations

### We are looking for...

- a partner who has a design optimization question relevant to the Eureka call.