

MATH-639

Model order reduction Summer School

Invited lecturers (see below)

Cursus	Sem.	Type
Mathematics		Opt.

Language of teaching	English
Credits	2
Session	
Exam	Oral presentation
Workload	60h
Hours	38
Courses	18
TP	10
Project	10
Number of positions	

Frequency

Only this year

Remark

Virtual summer school via Zoom from Sept. 7th - 10th 2020

Summary

The summer school gives an introduction to the basic MOR tools employed to obtain surrogate models of problems in engineering and other applied fields, often stemming from the numerical discretization of PDE models. Details on more recent developments in the field will also be discussed.

Content

Broadly speaking, the topics covered in the summer school include:

- Reduced Basis methods for linear and nonlinear problems
- Non-intrusive approximation of parametric problems
- POD methods
- Data assimilation
- Broad applications of Model Reduction

The invited speakers will give lectures on the following topics:

- Prof. Peter Benner (MPI, Magdeburg) - System-theoretic methods for linear and nonlinear MOR
- Prof. George Haller (ETH, Zurich) - Exact MOR using spectral sub-manifolds
- Prof. Olga Mula (Dauphine U, Paris) - MOR methods for data assimilation
- Prof. Cecilia Pagliantini (Tu/e, Eindhoven) - Structure-preserving MOR for dynamical systems
- Prof. Gianluigi Rozza (SISSA, Trieste) - MOR for industrial applications
- Prof. Kathrin Smetana (UT, Twente) - Randomized algorithms in MOR

Note

Invited lecturers:

Peter Benner, George Haller, Olga Mula, Cecilia Pagliantini, Gianluigi Rozza, Kathrin Smetana

Keywords

Model Reduction, parametric problems, numerics of PDEs, dynamical systems, surrogate modeling, Reduced Basis Method

Learning Prerequisites**Required courses**

(Required) Basics of numerical linear algebra and numerical approximation of (Partial) Differential Equations

Learning Outcomes

By the end of the course, the student must be able to:

- - to understand basic MOR techniques - to choose the appropriate MOR strategy for a given problem

Assessment methods

Oral presentation

Resources

Websites

- <http://Website: morss2020.epfl.ch>