CHALMERS UNIVERSITY OF TECHNOLOGY | UNIVERSITY OF GOTHENBURG

Course at the Department of Mathematical Sciences

MMF900 Graduate course in Mathematics with applications in science (7.5 Hp)

Introduction to Inverse and Ill-posed Problems

Short description

In the course will be considered physical formulations leading to ill- and well-posed problems, methods of regularization of inverse problems, different theoretical approaches for the inverse reconstruction of unknown coefficients in a Partial Differential Equation (PDE). Numerical methods of solution of inverse and ill-posed problems, such that Lagrangian approach and adaptive optimization, methods of analytical reconstruction and layer-stripping algorithms, least-squares and machine learning algorithms, will be considered. Methods of image reconstruction with applications in image deblurring and magnetic resonance imaging (MRI) will be also presented.

Location and dates

Department of Mathematical Sciences, November – December 2019, June 2020

Introductory lecture: November 5, 13.15-15.00, MVL 14.

Aim of the course

After a successful completion of the course the students will be able to apply mathematical methods for the analysis of inverse and ill-posed problems and handle numerical methods for their solution. The course gives 7.5 Hp.

Target group

Graduate students in mathematics and physics.

Entry requirements

Basic undergraduate mathematics courses in calculus of several variables, vector analysis, and partial differential equations.

Exam: Project work with a written report.

Course project: waves24.com/download

Registration: Please contact the course organizers for information.

Course organizers

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