Real algebraic geometry and optimization

February 15 &16, 2024, École polytechnique

Thorsten Theobald *(Goethe-Universität, Frankfurt am Main)*

PGMO and M2 Optimisation

https://www.fondation-hadamard.fr/PGMO

https://www.master-in-optimization.fr/ |------>

All lectures are in Amphi Becquerel

Lecture 1 - Thursday, February 15, 10h00-12h45
Lecture 2 - Thursday, February 15, 14h15-17h00
Lecture 3 - Friday, February 16, 10h00-12h45
Lecture 4 - Friday, February 16, 14h15-17h00

The purpose of the course is to provide a comprehensive access to interesting and important techniques in the interplay of real algebraic geometry and optimization. In the modern developments, these methods are essential for the optimization of polynomials and of exponential sums.

The lectures provide the background from real algebraic geometry and conic optimization, offer a comprehensive look behind the scenes of current polynomial optimization techniques and discuss recent developments. The topics and aspects include semialgebraic foundations, positive polynomials through sum of squares and convexity, polynomial optimization, spectrahedra, hyperbolic optimization, symmetry reduction, relative entropy methods and sums of nonnegative circuit polynomials.

This lecture series is jointly organized by Ecole Polytechnique, INRIA, Master d'Optimisation of Paris Saclay and IPP, and Fondation Mathématique Jacques Hadamard, in the framework of the Gaspard Monge Optimization Programme, with the support by EDF.

Registration (free of charge) on https://www.fondation-hadamard.fr/fr/ programmes/ les-programmes-thematiques/home/pg-mocourses/

Organizers
S. Gaubert *(INRIA & Ecole polytechnique)*
Q. Mérigot *(Université Paris Saclay)*
J.C. Pesquet *(CentraleSupelec)*
W. van Ackooij *(EDF)*
S. Elloumi *(ENSTA)*
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