MEASURE THEORETIC METHODS IN SPECTRAL SHAPE OPTIMISATION

Jean Lagacé

Department of Mathematics, University College London, UK
`j.lagace@ucl.ac.uk`

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Shape optimisation is a recurrent theme in spectral geometry: given an operator and some boundary conditions, what is the optimal domain for the associated eigenvalue problem. Traditionally, different boundary conditions and different operators are treated independently. I will present a unifying framework based on measure theory for treating many different optimisation problem at once, and to relate them to one another.

As an application, we will see that from the shape optimisation perspective, the Steklov, Laplace, and Neumann problems can be regrouped as part of a larger class, and how to use those methods to look for optimisers and their properties.

Based on joint work with Alexandre Girouard (Laval) and Mikhail Karpukhin (Caltech)