

Shape optimization for quadratic functionals and states with random right-hand sides

Marc Dambrine¹, Charles Dapogny², Helmut Harbrecht³

SUMMARY

In this talk, we investigate a particular class of shape optimization problems under uncertainties on the input parameters. More precisely, we are interested in the minimization of the expectation of a quadratic objective in a situation where the state function depends linearly on a random input parameter. This framework covers important objectives such as tracking-type functionals for elliptic second order partial differential equations and the compliance in linear elasticity. We show that the robust objective and its gradient are completely and explicitly determined by low-order moments of the random input. We then derive a cheap, deterministic algorithm to minimize this objective and present model cases in structural optimization.

Keywords: shape optimization, random right-hand side, quadratic functional

AMS Classification: 49Q10, 60H25, 65C20

References

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¹Departement of Mathematics,
Université de Pau et des Pays de l'Adour, Pau, France
email: marc.dambrine@univ-pau.fr

²Laboratoire Jean Kuntzmann,
CNRS, Université Joseph Fourier, Grenoble France
email: charles.dapogny@imag.fr

³Department of Mathematics and Computer Science
University of Basel, Basel, Switzerland
email: helmut.harbrecht@unibas.ch