Proposal-training

«Finite element quality for problem with uncertain data»

Supervisor: Eric Florentin (email : eric.florentin@lmt.ens-cachan.fr)

Place: ENS de Cachan

Student: Master1 degree

Objective: Most of mechanical simulation softwares are based on the finite element method. The objective of the work is to compare results obtained by different methods in a stochastic framework.

Context: The use of numerical simulations is very current today in mechanical design. Complex finite elements computations are exploited in a banal and daily way. The quality control of results provided by finite elements computations is since many years a major concern, as well as in the industrial field as in the field of research. It is in this context of increasing importance of simulation, that we propose to compare different methods. The comparison will be done in terms of quality and cost.
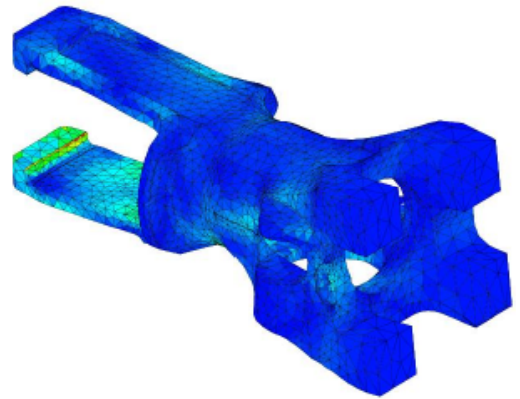
Agenda:
> Bibliographical study on stochastic methods;
> Implementation on 1D and/or 2D test cases;
> Study of properties of each method;
> Extension to more complex problems.

Pedagogical interest:
This project uses the contents of different courses of L3 and Master1 (mechanical engineering). The main idea is to implement classical and new methods in order to reinforce basic knowledge in the area.