



CSC Seminar

SPEAKER

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TITLE

Damping optimization of mechanical vibrating systems

ABSTRACT

The purpose of this talk is to present my research background and interests, and also to discuss possible research collaborations.

The first part of this talk is related to my PhD thesis, where I dealt with parameter dependent quadratic eigenvalue problems related to damping optimization of mechanical vibrating systems. While dealing with damping, one wants to optimize both the positions and the values of the dampers in the system. The focus of the thesis was on optimization of the values of the dampers and two optimization criteria were considered. The first one was the minimization of total average energy where we needed the solution of the Lyapunov equation, so we provided an efficiently computed approximation of the solution of the structured Lyapunov equation. The second criterion is frequency isolation, which is an eigenvalue based criterion. In this criterion we used ellipses, with centers on the imaginary axis, as the areas from which frequencies are isolated. Several approaches for eigenvalue approximations are provided to speed up the optimization.

Supervisors: Zoran Tomljanović and Ninoslav Truhar (Department of Mathematics, University of Osijek).

The second part is related to my current work on optimization of damping positions. The aim is to optimize the positions of the external dampers so that the influence of the input to the output is minimized, so we consider the output energy response as optimization criterion.

Joint work with: Jennifer Przybilla (MPI Magdeburg), Ninoslav Truhar (Department of Mathematics, University of Osijek), Peter Benner (MPI Magdeburg).

Tuesday, October 18, 2022 at 2 pm
seminar room Prigogine