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Inverse Problems Seminar

Spacetime finite element methods for control problems subject to the wave equation

Prof. Erik Burman University College London

<u>Abstract</u>

We consider the null controllability problem for the wave equation, and analyze a stabilized finite element method formulated on a global, unstructured spacetime mesh. We prove error estimates for the control function given by the computational method. The proofs are based on the regularity properties of the control function given by the Hilbert Uniqueness Method, together with the stability properties of the numerical scheme. The order of the error estimates reflects the stability of the problem and the optimal approximation of the finite element spaces, but are slightly suboptimal compared to direct interpolation. We will also comment on the convergence of the scheme for solutions with the minimal regularity. Some numerical examples will be presented in one space dimension and time. The talk is based on joint work with Lauri Oksanen, Ali Feizmohammadi and Arnaud Münch.

Date: 10 November 2022 (Thursday) Time: 4:00pm – 5:00pm (Hong Kong Time) ZOOM link: https://cuhk.zoom.us/j/98241093146 Meeting ID: 982 4109 3146

All are Welcome