RUB

Alberto Abbondandolo, Luca Asselle, Barney Bramham
Gerhard Knieper, Stefan Suhr, Kai Zehmisch

Oberseminar Dynamische Systeme

Morse Index Theorems for Graphs

Donnerstag, 11. Mai 2023
14:15 Uhr – Raum IA 1/177

Stefano Baranzini
(Turin)

Abstract:

In this talk I will discuss some Morse Index Theorems for a big class of constrained variational problems on graphs. Such theorems are useful in various physical and geometric applications. Given a graph G and a di erentiable functional A de ned on a suitable subspace of continuous function on G, one could ask: "How does the index of a critical point change when we change the topology of the graph?". The general formula I will present tries to answer this question. It expresses the di erence of Morse Indices of two Hessians, related to two di erent graphs or two di erent sets of boundary conditions, in terms of
a suitable symplectic invariant: the Maslov Index.
If time permits application of the formula will be given. For instance, it can be used to produce a certain type of discretization formulae to reduce the complexity of the computation of Morse Index to a nite dimensional problem or it can be specialized to the case of periodic extremals to get iteration formulae.
From a more hands-on perspective this formula can be used to compute numerically the Morse Index of some speci c problems such as the non-linear Schrödinger equation on symmetric trees.
This is a joint work with A. Agrachev and I. Beschastnyi.

Guests are very welcome!