Calculus of Variations and Optimal Control, 4V

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This course deals with main ideas of the classical calculus of variations and optimal control theory for ordinary differential equations.

Contents

Calculus of Variations:

One-dimensional variational problems, Examples: Brachistochrone problem and minimal rotational surface, Euler equation and extremals, corner conditions, Jacobi conditions, isoperimetric problem

Optimal control: Controllability, linear time optimal control, Pontrjagin's maximum principle for nonlinear problems, feedback control and matrix Riccati equation, numerical techniques

Suggested reading:

- Hestenes, M.R.: *Calculus of variations and optimal control theory.* Wiley 1967
- Macki, J. and Strauss, A.: *Introduction to optimal control theory.* Springer 1982