A geometrical approach of an optimal control problem governed by EDO

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Abstract:

The theory of optimal control is a very important branch of optimization, the resolution of the problems controls optimal asks for the intervention of several mathematical tools, in particular the partial derivative equations. In this work one gives a geometrical approach of a problem of optimal control, it where one calls on the basic notions of the calculation of the variations such as the equation of Euler-Lagrange which is a requirement of optimality, the principle of maximum of Pontriagaine (PMP), which gives an analytical aspect to the problem controls optimal and makes it possible to study unquestionable property of the functions which defines the criterion to be minimized, the regularity of the solutions (minimum or maximum). An other very important aspect is well geometrical aspect which is used to find the geodetic ones, their natures, their numbers which requires a geometrical luggage such as the fields, of vector, the vector spaces, the curve acceptable… Then can about it defines a problem controls optimal controlled by EDO geometrically by giving some conditions.

References:
[1] NR Burq and P. Gerard; Optimal control of the partial derivative equations.
[2] Ovidiu Calin Der-Chen Chang; Geometric Mechanics one Riemannian Manifolds; Birkhäuser Boston 2005 [3] L.C.Young; readings one the calculus of variations and optimal control theory; Chelsea publishing company; N.Y, 1980

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