

Constrained Variational Problems Governed by Gradient-Type Variations and Biomedical Applications

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Abstract

The aim of this paper is the optimization of constrained simple, multiple and curvilinear integral type functionals by considering gradient-type variation functions. Concretely, the associated necessary conditions of optimality are stated by applying appropriate mathematical pipelines. The main results highlight the controlled Euler- Lagrange type differential equations, creating a novel perspective in the variational calculus field. In addition, several biomedical illustrative examples are provided to validate the theoretical outcomes.

Keywords

Constrained variational problems, gradient-type variations, Euler-Lagrange equations.

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