

Extrema of Functionals, the Euler-Lagrange Equation and an Application in Economics

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Abstract

Perhaps the one of the most central problems in economics is that of utility maximization. Often, life time utility is represented by a functional, thus solving the maximization problem requires finding extrema of functionals. We will give an introduction to the theory of finding extrema of functionals (called variational problems), and derive the Euler-Lagrange equation, which is the "first order condition" for such problems. We will then discuss an application of the theory to a current paper I am working on, concerning addictive behavior and its treatment. The talk will be slightly technical, but should be accessible to all upper level undergraduate and graduate students. As always, all are welcome to attend.