EXTENSION OF LIPSCHITZ INTEGRANDS AND MINIMIZATION OF NONCONVEX INTEGRAL FUNCTIONALS APPLICATIONS TO THE OPTIMAL RECOURSE PROBLEM IN DISCRETE TIME

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Abstract: A measurable integrand $f(s, x)$ satisfying a Lipschitz property in x on $\Gamma(s) \subset R^n$ is extended to the whole of R^n preserving the Lipschitz condition in x. This extension is obtained by using the process developed in [6] for an arbitrary function f, Lipschitz on a given subset. The problem of minimizing the integral

$$I_f(x) = \int_S f(s, x(s)) dv(s)$$

over a subset $\mathcal{X}$ of measurable functions x satisfying $x(s) \in \Gamma(s)$ almost everywhere is transformed into the problem of minimizing over $\mathcal{X}$ the integral functional $I_g(x)$ associated with the extended integrand g. Comparison results for optimal values as well as for solutions of the two problems are described. Finally, the results are applied to obtain necessary conditions for optimality for a class of multistage nonconvex stochastic programs.

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