

Dual approximations in Fully Convex Control

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Abstract

We will first survey Rockafellar's work from the 1970's in Fully Convex Control (FCC). This pioneering work led to the vast and more general neoclassical calculus of variations, often referred to as dynamical optimization. The availability of duality in FCC has no counterpart classically.

We introduce Goebel's self-dualing envelope to approximate an FCC problem that has potential impulses and state constraints with one without these. The advantage of this approach is that it preserves the duality structure. Under suitable hypotheses, we will demonstrate that optimal solutions to the approximate problems converge to the a solution of the original as the envelope parameter decreases to 0.