

Randomized Impulse Control Problem and Reinforcement Learning

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In this work, we study a randomized optimal impulse control problem. This framework is particularly suitable for devising reinforcement learning algorithms with exploration to solve for the otherwise hard-to-explicitly-derive optimal impulse control policies. We provide a two-layer randomized impulse control framework and then analyze the associated HJB equation. We discuss its relations with (randomized) optimal stopping as well as the classical impulse control problem. We also present an exploratory reinforcement learning algorithm that helps learn the randomized impulse policy. This is a joint work with Prof. Yuchao Dong (Tongji University) and Zhouhao Yang (Johns Hopkins University).

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