

Pontryagin's principle for some probabilistic control problems

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Several problems in practice are described by a set of controlled state equations. If the problem moreover exhibits uncertainty, one can imagine these state equations to be parametrized by a random event or outcome. One may wish to control the final (random) state and ensure that it hits a desired region of space with large enough probability. Motivated by such a setting, we will discuss the derivation of a Pontryagin's optimality principle. The principle builds on (an extension) of recently developed differentiability results for probability functions. With both elements in place, we will also show how the resulting principle can be put to work.

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