Numerical solving of an optimal control problem in large time in presence of the turnpike: the example of the "Bunt"

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In this talk, we present a numerical strategy to successfully solve an optimal control problem in large time horizon T using the shooting method. The specificity of the considered problem is the presence of the partial turnpike phenomenon. In order to overcome the classical initialization issue, we perform the continuation method over three intermediate problems of increasing dimension and complexity. Moreover to overcome the numerical stability issues when T is large, we use a variant of the shooting method, by initializing it, roughly speaking, "in the vicinity of the turnpike". This idea is strongly inspired by [1].

Références

[1] E. Trélat, E. Zuazua, *The turnpike property in finite-dimensional nonlinear optimal control*, Journal of Differential Equations **258** no.1, 81-114, 2015

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