

François Delarue

Université Nice-Sophia Antipolis

Exploration noise for learning linear-quadratic mean field games

Abstract : The goal of this paper is to demonstrate that common noise may serve as an exploration noise for learning the solution of a mean field game. This concept is here exemplified through a toy linear-quadratic model, for which a suitable form of common noise has already been proven to restore existence and uniqueness. We here go one step further and prove that the same form of common noise may force the convergence of the learning algorithm called ‘fictitious play’, and this without any further potential or monotone structure. Several numerical examples are provided in order to support our theoretical analysis. This is a joint work with A. Vasileadis (PhD Student, Nice) .