

Inverse Boundary Problem for Mean Field Games System

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We propose and study several inverse problems for the mean field games (MFG) system in a bounded domain. Our focus is on simultaneously recovering the running cost and the Hamiltonian within the MFG system by the associated boundary observation. We develop two mathematical strategies that can ensure the probability constraint as well as effectively tackle the inverse problems, which are respectively termed as high-order variation and successive linearisation. In particular, the high-order variation method is new to the literature, which demonstrates a novel concept to examine the inverse problems by nonnegative inputs only.