Online Active Trajectory Classification for Motion-based Communication of Robots

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Problem Set-up
The message sender sends a message by performing the corresponding trajectory chosen from the trajectory codebook.

Online State Estimation
The receiver is allowed to sequentially move around the sender to estimate the trajectory class as it observes the trajectories of the same class repeated by the sender.

Simulation Results
Three different trajectory classes were used in the simulation. All the trajectories were assumed to be 2D.

Entropy-based Control Policy
The control policy is formulated to minimize the conditional entropy over the categorical distribution $z$.

Due to the weighted Gaussian approximation to the belief state, this objective function can be evaluated analytically.

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