Area: Control, Intelligent Systems & Robotics (CISR)

Host: Prof Vincent Tan Yan Fu

TOPIC	:	**Asymptotically Optimal Linear Best Feasible Arm Identification with Fixed Budget**
SPEAKER	:	**Mr Bian Jie** **Graduate student, ECE Dept, NUS**
DATE	:	**Monday, 21 April 2025**
TIME	:	**4:00PM-5:00PM**
VENUE	:	**Join Zoom Meeting** **https://nus-sg.zoom.us/s/9839098564** **Meeting ID: 9839098564** **Passcode: no password**

ABSTRACT

The problem of identifying the best feasible arm within a fixed budget has garnered significant attention in recent years. However, there remains a gap in the literature – the exact exponential rate of decrease of the error probability to zero has not been established, even in the relatively simple setting of K-armed bandits with Gaussian noise. In this paper, we fill this gap by investigating the problem in the context of linear bandits. We propose a novel algorithm for best feasible arm identification that achieves an exponential rate of decay of the error probability. The exponent matches that of an information-theoretic lower bound. This is done by leveraging a posterior sampling framework in the min learner within a game-based sampling rule involving a min- and a max-learner. This strategy is in the same spirit as Thompson sampling. Additionally, we demonstrate the effectiveness of our algorithm through empirical evaluations on several instances of varying hardness, corroborating the theoretical result, and showcasing that the algorithm outperforms several benchmark algorithms.

BIOGRAPHY

Bian Jie is currently pursuing his Ph.D. degree under the supervision of Professor Vincent Tan in the Department of ECE, NUS. His current research interests are in Multi-armed bandit.

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