

Topics In Game Theory: Learning, Experimentation, and Information

FDPE Spring 2022

Information plays an important role in economic decision making. This course focuses on learning and information in dynamic settings. In this course, we'll study dynamic models of information that form the building blocks for work ranging from applications as diverse as theoretical models of how to invest developing new technologies (and when to stop), empirical studies of searching for a productive match in the labor market, and practical algorithms for determining which website layout maximizes click-through rates. Throughout this course, we'll learn many different techniques for analyzing continuous and discrete time dynamic models in economics, and apply them to questions relating to learning, information aggregation, and experimentation in strategic settings. The course is divided into three sections focusing on different aspects of this topic.

Instructor

Part 1

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Lectures and study material:

Each section of the course will consist of three lectures. The final three lectures are reserved for student presentations. The lectures are from 13:00-15:00 on Tuesday and Thursday in Ekonominaukio 1.

Part 1:

Part 1 will introduce bandit models in discrete time. We'll see how to characterize the optimal policy using the Gittins index and introduce economic applications of discrete time bandits.

Part 2:

In part 2 we'll study experimentation in continuous time. We'll see models of experimentation in settings with Brownian or Poisson information and learn how to use continuous time techniques to characterize the evolution of beliefs and the optimal policy.

Part 3:

In part 3, we'll study models of social learning and herding. We'll discuss models where decision makers learn from observing the actions of others and when information aggregation succeeds or fails in these settings.

Student Presentations:

In addition to these three parts, the final section of the course will consist of student presentations. Students will choose and present a paper from the reference list and prepare a presentation. These presentations will be done in the final 3 lectures and determine the course grade.