Understanding and Predicting Technological Innovation: New Data and Theory
Prof. Jessika Trancik
July 22-26, 2019

Class Outline

Monday: Module 1: Data

9:00-10:30: Lecture on evidence of technology innovation. What does the data suggest?

10:30-10:45: Break

10:45-12:00: Discussion continued.

12:00-1:30: Lunch

1:30-3:00: Guided exercise on analyzing technology improvement trends.

3:00-3:30: Break

3:30-5:00: Analyzing technology improvement trends, continued. Students will work in groups and report back on their assessment of the rates of innovation across various industries.

Tuesday: Module 2: Theory

9:00-10:30: Lecture on proposed models of technological innovation. How do we explain the observed evidence?

10:30-10:45: Break

10:45-12:00: Discussion continued.

12:00-1:30: Lunch

1:30-3:00: Guided lecture and exercise on comparing the predictive ability of proposed models. Students will fit the data with proposed models and test the performance of the models.
3:00-3:30: Break

3:30-5:00: We will identify and have a group debate the best-performing models across various industries.

**Wednesday: Module 2: Theory**

9:00-10:30: Lecture on proposed theory relating the rate of technological innovation to design features of technologies. Which technologies improve fastest and why?

10:30-10:45: Break

10:45-12:00: Discussion continued.

12:00-1:30: Lunch

1:30-3:00: Lecture, followed by group exercise and discussion on design and investment decisions based on features of a technology's design.

3:00-3:30: Break

3:30-5:00: Students will consider the component dependencies and flexibility of various technologies and industries, working in small groups.

**Thursday: Module 3: Application**

9:00-10:30: Lecture on applying insights from data and theory to decision making in private firms and government. How can we optimize technology design decisions and investment portfolios?

10:30-10:45: Break

10:45-12:00: Guided exercise on decision models.

12:00-1:30: Lunch

1:30-3:00: Students will optimize technology portfolios in a context of interest: engineering design, private investment, or public investment.

3:00-3:30: Break

3:30-5:00: Group work continued.
**Friday: Module 3: Application**

9:00-10:30: Students will report back on Thursday afternoon’s work on design or portfolio optimization.

10:30-10:45: Break

10:45-12:00: Summary lecture and discussion.

12:00-2:00: We will have an extended working lunch that will include further discussion and a free-form lecture by the professor and/or group discussion on applications of specific interest to the class.