Course Description

This course starts from the premise that data is digitized information that facilitates prediction and reduces uncertainty. It introduces a set of information-related tools drawn from statistics, macroeconomics, and finance to model and measure data economies. Students will explore how firms acquire, process, and use data to make predictions and how these data-driven decisions aggregate to affect macroeconomic outcomes.

At the heart of the course lies the concept of the **data feedback loop**—a self-reinforcing dynamic that arises when firms generate data as a by-product of their own economic activity. The course emphasizes both theory and practice, with a strong focus on measurement: how to quantify the value of data, how to evaluate the effectiveness of prediction, and how to assess the macroeconomic implications of data-driven decision-making.

Course Outline

Session 1 – Foundations: The Data Economy & Tools for Prediction

- Topics:
 - What is data? Digitized information as a tool for reducing uncertainty.
 - \circ $\;$ $\;$ Introduction to the data economy and the data feedback loop.
 - Bayesian learning and belief updating.
- Suggested Readings:
 - The Data Economy, Chapters 1 & 2
 - Veldkamp & Chung (2019), "Data and the Aggregate Economy" (*Journal of Economic Literature*, forthcoming)
 - Goldfarb & Tucker (2019), "Digital Economics" (JEL, 57(1), 3–43)
 - Baley & Veldkamp (2023), "Bayesian Learning," in *Handbook of Economic Expectations*

Session 2 – Data Sources, Frictions, and Rational Inattention

- Topics:
 - Economic data sources and their limitations.
 - Sticky information and attention constraints.
 - Implications for individual and aggregate behavior.
- Suggested Readings:
 - o The Data Economy, Chapter 3
 - Mankiw & Reis (2002), "Sticky Information vs. Sticky Prices" (*QJE*)
 - Sims (2003), "Implications of Rational Inattention" (*JME*)

Session 3 – From Micro to Macro: Data-Driven Predictions and Aggregate Outcomes

- Topics:
 - Firm forecasting behavior and aggregate mismatch.
 - Business cycle implications of informational frictions.

• Suggested Readings:

- The Data Economy, Chapter 4
- Baley, Figueiredo & Ulbricht (2022), "Mismatch Cycles" (JPE)
- Lucas (1972), "Expectations and the Neutrality of Money" (JET)
- Baley & Blanco (2019), "Firm Uncertainty Cycles" (AEJ: Macro)
- Mackowiak & Wiederholt (2009), "Optimal Sticky Prices under Rational Inattention" (AER)

Session 4 – Strategic Use of Information and Coordination

- Topics:
 - Public vs. private signals
 - Social value of information
 - \circ $\;$ Strategic information acquisition and coordination motives
- Suggested Readings:
 - The Data Economy, Chapter 5
 - Morris & Shin (2002), "Social Value of Public Information" (AER)
 - Woodford (2003), "Imperfect Common Knowledge"
 - Hellwig & Veldkamp (2009), "Knowing What Others Know" (REStud)
 - Hellwig, Kohls & Veldkamp (2012), "Information Choice Technologies" (AER)
 - Venkateswaran (2014), "Heterogeneous Information and Labor Market Fluctuations" (SSRN)

Session 5 – Data as Capital: Feedback Loops, Measurement, and Value

- Topics:
 - o Data as a production input and non-rival capital
 - Endogenous generation of data through economic activity
 - Measurement and valuation of data
- Suggested Readings:
 - The Data Economy, Chapters 9 & 10
 - Farboodi & Veldkamp (2022), "A Model of the Data Economy" (*NBER WP*)
 - Jones & Tonetti (2020), "Nonrivalry and the Economics of Data" (AER)
 - Asriyan & Kohlhas (2024), "The Macroeconomics of Data" (CREi WP)
 - Abis & Veldkamp (2024), "The Changing Economics of Knowledge Production" (*RFS*)

Chen et al. (2023), "Expectation Formation over the Firm's Life Cycle" (JME)