Course:	Structural Microeconometrics
Faculty:	Joan Llull
Term:	2nd Semester
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Office Hours:	upon request

Description:

This course deals with methods and applications of dynamic discrete choice structural models in Economics. The methods that we will discuss are useful to students with interests in Labor Economics, Industrial Organization, Quantitative Macro, Development Economics and many other fields in Applied Micro. The course reviews the main approaches to formalize and estimate such models, which represent the behavior of forward looking agents making discrete decisions. These models constitute a useful tool for policy evaluation and an interesting complement to reduced form approaches. In particular, they have the advantage of allowing for ex-ante policy evaluation, and of providing external validity for the inference, subject to the model assumptions. They also have the benefit of providing a close link between economic theory and empirics, and the possibility of making inference about the predictions of a model.

Outline:

1. Full solution Maximum Likelihood approaches
    a. Introduction
    b. Basic framework: conditional independence
    c. Motivational example: Rust's engine replacement model

    d. Estimation using full solution techniques
    e. Extensions: unobserved heterogeneity and equilibrium
2. Conditional Choice Probability (CCP) estimation
    a. Conditional value function representation
    b. Finite dependence
    c. Estimation methods
    d. Unobserved heterogeneity and equilibrium
    e. Aguirregabiria and Mira's iterative approach
3. Dynamic Discrete Games and Auctions: an introduction
    a. Dynamic Discrete Games
    b. Auctions

References:

Adda, J. and R. W. Cooper (2003), *Dynamic Economics: Quantitative Methods and Applications*. The MIT Press.

Aguirregabiria, V. and P. Mira (2002), "Swapping the Nested Fixed Point Algorithm: A Class of Estimators for Discrete Markov Decision Models", *Econometrica*, 70, 1519-1543.

Aguirregabiria, V. and P. Mira (2007), "Sequential Estimation of Dynamic Discrete Games", *Econometrica*, 75, 1-53.

Aguirregabiria, V. and P. Mira (2010), "Dynamic Discrete Choice Structural Models: A Survey", *Journal of Econometrics*, 156: 38-67

Arcidiacono, P. and P. B. Ellickson (2011), "Practical Methods for Estimation of Dynamic Discrete Choice Models", *Annual Review of Economics*, 3, 363-394.

Arcidiacono, P. and R. A. Miller (2011), "Conditional Choice Probability Estimation of Dynamic Discrete Choice Models with Unobserved Heterogeneity", *Econometrica*, 79, 1823-1867.

Hong, H. and M. Shum (1998), "Structural Estimation of Auction Models", In: Patrone F., García-Jurado I., Tijs S. (eds) Game Practice: Contributions from Applied Game Theory. Theory and Decision Library (Series C: Game Theory, Mathematical Programming and Operations Research), vol 23. Springer, Boston, MA.

Hotz, V. J. and R. A. Miller (1993), "Conditional Choice Probabilities and the Estimation of Dynamic Models", *Review of Economic Studies*, 60, 497-529.

Keane, M. P. and K. I. Wolpin (1997), "The Career Decisions of Young Men", *Journal of Political Economy*, 105, 473-522.

Rust, J. (1987), "Optimal Replacement of GMC Bus Engines: An Empirical Model of Harold Zurcher", *Econometrica*, 55, 999-1033.

Grading:

50% Final exam. 25% Problem sets. 25% Paper presentation.