

**Econ 712: Topics in Econometrics**  
**University of Pennsylvania, Fall 2017**

**Instructor: Xu Cheng**

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- Office: 3718 Locust Walk, McNeil Building, Room 527
- Lecture: Tuesday and Thursday 9-10:20AM, McNeil 410
- Office Hours: Thursday, 12-1PM.

**Pre-requisites:**

- undergraduate level real analysis and linear algebra and first year graduate econometrics sequence

**Exams and Problem Sets**

1. Presentation: Each student is required to make a 30-minute presentation on a paper related to the topic discussed in the lecture.
2. Replication Exercise: Replicate the simulation exercise in a paper related to the topic discussed in the lecture.
3. For both the presentation and the replication, the paper should be approved by the instructor first.

**Outline for Course**

The course covers two topics: (i) inference in non-standard problems and (ii) high-dimensional models.

For the first topic, we discuss some recent development in partially identified models with moment inequalities, robust inference in weakly identified models, estimation and testing with parameters on the boundary, and some generic results for non-standard models with discontinuous asymptotic distributions. For all these models, standard asymptotic approximations such as the normal distributions and chi-square distribution are not satisfactory. Therefore, alternative asymptotic results are introduced.

For the second topic, we discuss the latent factor model for large-scale panel data and model averaging and model selection methods in regressions with a large number of regressors. Methods such as the principle component estimation, Mallows model averaging and cross-validation model averaging, and LASSO model selection and their asymptotic properties are discussed. Finally, we study some applications of these methods to GMM moment selection, latent factors models with instabilities, and structural VAR models.