stats300b: Theory of Statistics II

John Duchi

Winter Quarter 2021
Introduction

- what’s in the class
- why it’s fun and useful
- logistics for this quarter
What is this course about

- convergence of random variables, vectors, and functions
- notions of optimality and quality of estimators
What you need to be happy

- stats300a is probably a good idea (not strictly necessary)
- probability theory at the level of 310a
- analysis at the level of Math171
The three parts of the course

I finite dimensional problems and models

II optimality and comparisons

III infinite dimensional and uniform problems
Why this course will be fun

▶ beautiful theory, you’ll be able to read and understand much of the Annals of Statistics
▶ we’ll understand why different estimators might work and how to think about convergence
▶ you’ll work like a dog but you’ll like it
Some logistics

- Course staff
- The “etudes” and grading policy
- Course videos
- Office hours and piazza
Course Staff

- instructor: John Duchi
- TAs: Maxime Cauchois (Stats PhD) and Kevin Guo (Stats PhD)
- email: stats300b-win2021-staff@lists.stanford.edu
Grading policy and études

étude (noun): a short musical composition, typically for one instrument, designed as an exercise to improve the technique or demonstrate the skill of the player.
Grading policy and études

étude (noun): a short musical composition, typically for one instrument, designed as an exercise to improve the technique or demonstrate the skill of the player.

- weekly homeworks, each entire problem graded on a scale of \{0, 1, 2\}, 50% of the grade
- these can be done in groups, etc.
- weekly étude problems
  - a single problem, to be done alone (no collaborators—these are not duets), but open internet
  - we are unlikely to help you with these
  - due 24 hours before the homework assignment
  - you have 24 hours to grade your own assignment and get 50% credit back
  - we will omit the lowest scoring of your études
Course videos

▶ course videos accessible via Canvas website
▶ pre-record roughly 30 minute lectures to be watched asynchronously, incorporate the slides to be posted on webpage
▶ live sessions will be focused on solving problems and working through examples
  ▶ I will try, but do not guarantee, that I will upload notes from the live sessions
Office hours and Ed

- the TAs and I will hold virtual office-hours (times TBD)
- will use them to answer questions about whatever you like
- ed available for the class (link on the course webpage)