

# Stanford University

## Department of Statistics

### DEPARTMENTAL SEMINAR

4:30pm, Tuesday, November 12, 2019  
McCullough Building (04-490) Room 115

Refreshments served at 4pm in Sequoia Lounge.

**Speaker:** Emmanuel J. Candès, *Stanford Mathematics and Statistics*

**Title:** **Reliable predictions? Equitable treatment?**  
**Some recent progress in predictive inference**

**Abstract:**

Recent progress in machine learning (ML) provides us with many potentially effective tools to learn from datasets of ever increasing sizes and make useful predictions. How do we know that these tools can be trusted in critical and high-sensitivity systems? If a learning algorithm predicts the GPA of a prospective college applicant, what guarantees do I have concerning the accuracy of this prediction? How do we know that it is not biased against certain groups of applicants? This talk introduces statistical ideas to ensure that the learned models satisfy some crucial properties, especially reliability and fairness (in the sense that the models need to apply to individuals in an equitable manner). To achieve these important objectives, we shall not “open up the black box” and try understanding its underpinnings. Rather we discuss broad methodologies — conformal inference, quantile regression, the Jackknife+ — that can be wrapped around any black box to produce results that can be trusted and are equitable.