Ideas and Methods of Empirical Process Theory with an Eye toward Applications in Statistics

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My lectures will be in two parts.
In Part I, I will survey classical empirical process theory and its application to the study of the large sample properties of nonparametric statistics. I will discuss such important and useful results as the Skorohod representation, the KMT Brownian bridge approximation to the empirical and quantile processes and weighted approximations to these processes and their Martingale generalizations. In the process I will demonstrate their use in proving central limit theorems for L-statistics and trimmed sums, among other examples, as well as in the derivation of the asymptotic distribution of various goodness-of-fit tests. This material forms what may be called the Seattle-Hungarian School of Empirical Processes. Much of the material will be taken from the text: Empirical Processes with Applications to Statistics, by Galen Shorack and Jon Wellner, and my research papers.

In Part II, I will touch upon some of the main ideas and tools of modern empirical process theory, and then, to illustrate their use, I will show how they are applied in two recent papers of mine on kernel-type non-parametric function estimators. Much of the theory will be taken from the texts: Decoupling: From Dependence To Independence, by Víctor de la Peña and Evarist Giné, Uniform Central Limit Theorems, by Richard Dudley, and Empirical Processes with Applications to Statistics, by Aad van der Vaart and Jon Wellner.

I plan to provide nearly complete typed notes for my lectures and a bibliography. My December lectures will cover Part I.