

Statistical Techniques for Particle Physics

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mercredi 21 mai 2008 11:00 (1h 30m)

This series will consist of two 1.5 hour lectures on statistics for particle physics. The first lecture will begin with a review the basic principles of probability, some terminology, and the three main approaches towards statistical inference (Frequentist, Bayesian, and Likelihood-based). I will then outline the statistical basis for multivariate analysis techniques (the Neyman-Pearson lemma) and the motivation for machine learning algorithms. In the second lecture, I will extend simple hypothesis testing to the case in which the statistical model has one or many parameters (the Neyman Construction and the Feldman-Cousins technique) and outline techniques to incorporate background uncertainties. If time allows, I will briefly touch on the statistical challenges of searches for physics beyond the standard model and some ideas for the future.

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