BAYESIAN DATA ANALYSIS: A GENTLE INTRODUCTION

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Abstract

The analysis of experimental data is essential to the development of scientific theories, but the type of reasoning used in formulating hypotheses and having them substantiated by the data has been the subject of great controversies for over two hundred years.

Using simple examples—such as coin-tossing—I shall illustrate the source of the disagreements and give reasons why the Bayesian approach is superior to standard ("orthodox") statistical analysis. Time permitting, I shall also show how E.T. Jaynes used Bayesian ideas to derive Fick's law of diffusion.