MAXENT: THEN AND NOW

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Abstract

The principle of Maximum Entropy has had a long and controversial history. It was first used by Gibbs to formulate his maximum "ensemble" but more formally introduced by Brillouin in 1952 and then later (and more famously) by Jaynes in 1956. Since then it has had many mathematical tribulations and manifestations. This paper has three objectives: 1) To put the principle in a historical perspective regarding its origin, use, controversies and current status. 2) To pragmatically show how it functions and explain the key concepts it employs. 3) To demonstrate how it is used currently to bring traditional MaxEnt and Bayesian inference under one roof which I call the method of Maximum relative Entropy (MrE).

This paper is not intended to be an authoritative review of the principle of Maximum Entropy. It is meant to ask questions, some of which will be given possible answers. Some will remain open. However, it is my hope that it will at least provide paths for the reader to explore and find the answers themselves.

Key Words: Maximum Entropy, Bayes, Relative Entropy