

A B S T R A C T

This dissertation examines the maximum entropy principle and the minimum cross entropy principle in detail. Our emphasis is on the usefulness of these methods as they can be easily applied to many different areas.

Chapter I, gives some background on the entropy concept: its interpretation, some of its properties and we mention some of the generalizations of Shannon's entropy which has been given by workers in the field. Cross entropy and the weighted entropy are also mentioned.

Chapter II introduces some of the different concepts of probability theory. The frequency view, the subjective view and the axiomatic method of Kolmogorov are mentioned. We emphasize the role of subjective probability and uncertainty in decision making.

Chapter III discusses the maximum entropy principle of Jaynes. We introduce Jayne's principle as a decision-making principle when some information (in a special form) is available to us.

Chapter IV deals with the characterization of many common invariant distribution; thus highlighting one of the many areas in which the maximum entropy principle has proven most useful.

Chapter V gives a full discussion of Kullback's minimum cross entropy principle. We discuss the properties of cross entropy, the use of the principle as a decision-making tool and point out some rich results by looking at the mathematics of cross entropy minimization.

Finally, Chapter VI further demonstrates the power of the maximum entropy principle in marketing. With a few assumptions, it is shown that the maximum entropy principle can generate some useful models of the market behaviour. These results are quite interesting as the models are very general and can therefore serve to give a greater understanding of several marketing situations.

ABSTRACT This dissertation contains concluding remarks and references.

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