Abstract

Information theory as a separate discipline is about 64 years old. Since information is energy, we have to measure, manage, regulate and control it for the welfare of mankind. The main use of information is to remove uncertainty. In fact, we measure information supplied by the amount of uncertainty removed so that the measure of information is essentially a measure of uncertainty.

There are many branches of information theory namely information measure, source coding, channel capacity, distortion theory, error correcting codes, sample theory, etc. Our study focuses mainly on characterization of life time distributions using new generalized measures of past entropies. We define some generalized mean code word lengths and study their bounds by applying the generalized Shannon’s inequalities.

Boekee and Lubee (1980) introduced R-norm information measure of a distribution P which was generalized by many authors. In our thesis we study the bounds of new generalized mean code word length in terms of the generalized R-norm information measure.

Communication theory deals primarily with system for transmitting information or data from one point to another through a channel. Shannon (1948) defined channel capacity in terms of source X and destination Y distributions. In our study we attach utility distribution with the source distribution and study channel capacity with utility of discrete memoryless channels.

The problem of transmitting information through a single channel can be extended to information transmission through cascade of channels. Channel can be cascaded in different ways depending on the conditions of transmitter and receiver. In our present study we discuss properties and classification of cascaded channels. We prove some theorems on channel capacity of N identical cascaded channels with utility, which is a new area of research.