



# Differential Entropy

## 1 Why

We want a notion of entropy for continuous random variables.

## 2 Definition

The *relative entropy* of a probability density function is the integral of the density against the negative log of the density.

### 2.1 Notation

Let  $R$  denote the set of real numbers. Let  $f : R^n \rightarrow R$  be a probability density function. The differential entropy of  $f$  is

$$-\int f \log f$$

We denote the differential entropy of  $f$  by  $h(f)$ .