



# Differential Cross Entropy

## 1 Why

## 2 Definition

The *differential cross entropy* of a second density with respect to a first density is the integral of the second density against the negative log of the first density. Let  $R$  denote the set of real numbers. Let  $f : R^n \rightarrow R$  and  $g : R^n \rightarrow R$  be probability density functions. The differential cross entropy of  $f$  relative to  $g$

$$- \int g \log f$$

We denote the differential cross entropy of  $f$  relative to  $g$  by  $h(g, f)$ .



Differential Cross Entropy



Differential Entropy



Multivariate Real Density



N-Dimensional Space



Space



