

Points on E. T. Jaynes Paper Phys Rev May 15  
1957

1. Does not solve problem of argument from ignorance, but merely ~~stall~~  
based on "equal a priori prob."
2. Reason for this is subtle, based on  
assuming "equality" for all discrete  
states. Difficulty shows clearly

when go continuous. Reflection shows that proper general def of info or entropy is relative — relative to some given (apriori if you will) weighting or measure. (in general given by the set limit of  $\sum_i p_i \ln \frac{p_i}{a_i}$  which always exists). Point is, this leaves discrete case  $\sum_i p_i \ln \frac{p_i}{a_i}$  where  $a_i$  arbitrary  $> 0$ .

When this is realized, your general prescription collapses, since you still haven't solved the basic problem of the proper measure. Your choice  $\varrho_i = 1, \forall i$ , simply is concession of equality of all discrete states -- equivalent to an equal apriori probability assumption.

To be completely concrete, I present an example where your prescription is obviously false.

Counter Example:

Stock Process

$$\begin{pmatrix} & 1 \\ 1 & 2 \end{pmatrix} \begin{pmatrix} \frac{1}{3} & \frac{2}{3} \\ \frac{1}{3} & \frac{2}{3} \end{pmatrix} \begin{pmatrix} x_1 \\ x_2 \end{pmatrix}$$

~~5.7~~

$$\frac{1}{3}x_1 + \frac{1}{3}x_2 = x_1$$

$$\frac{2}{3}x_1 + \frac{2}{3}x_2 = x_2$$

$$\frac{1}{3}x_2 = \frac{2}{3}x_1$$

$$x_2 = 2x_1$$

$$x_1 = \frac{1}{3}$$

$$x_2 = \frac{2}{3}$$

$$\frac{2}{3}\left(\frac{1}{3}\right) + \frac{2}{3}\left(\frac{2}{3}\right) = \frac{2}{3} \checkmark$$

Stationary Value

$P_1^* = \frac{1}{3}$
$P_2^* = \frac{2}{3}$

General Problem Starting with  $P_1, P_2$  at  $\infty - P$   
at  $n$  steps later

then

more gen.

General question given priori prob.,  $P_i$

Then given some statistics,

- such as ~~Exp~~  $f(x_i)$ , what  
is most likely distrib?

Model