

# THE ABC OF MODEL SELECTION: AIC, BIC, AND THE NEW CIC

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## Abstract

Geometric statistical ignorance suggests new criteria for model selection. One example is:

$$\text{CIC} = -\text{LogLik} + \frac{d}{2} \log \frac{N}{2\pi} + \log V + 3.4657 \frac{R}{N \log(d+1)}$$

where  $N$  is the sample size,  $d = \dim(M)$  is the dimension of the model  $M$ ,  $V = \text{Vol}(M)$  is its information volume and  $R = \text{Ricci}(M)$  is the Ricci scalar evaluated at the MLE. I study the performance of CIC for the problem of segmentation of bitstreams defined as follows: Find  $n$  from  $N$  iid samples of a complete dag of  $n$  bits. The CIC criterion outperforms AIC and BIC by orders of magnitude when  $n > 3$  and it is just better for the cases  $n = 2, 3$ .

References:

- [1] Carlos C. Rodríguez. <http://omega.albany.edu:8008/ignorance/>, (2002).
- [1] Carlos C. Rodríguez. <http://omega.albany.edu:8008/bitnets/>, (2004)

Key Words: Information Geometry, Model Selection, Bitnets, Statistical Ignorance, Segmentation of Bitstreams