Information theory for physicists

Christopher Berry
cplb@star.sr.bham.ac.uk
@cplberry

Information Theory, Inference & Learning Algorithms

David J.C. Mackay

http://www.inference.phy.cam.ac.uk/mackay/itila/book.html

Chapters: 1, 2, **3**

The Bell System Technical Journal

Vol. XXVII *July, 1948* *No. 3*

A Mathematical Theory of Communication

By C. E. SHANNON

Introduction

THE recent development of various methods of modulation such as PCM and PPM which exchange bandwidth for signal-to-noise ratio has intensified the interest in a general theory of communication. A basis for such a theory is contained in the important papers of Nyquist[1] and Hartley[2] on this subject. In the present paper we will extend the theory to include a

Shannon, C. E.; *The Bell System Technical Journal;* **27**(3):379–423; 1948.
Shannon, C. E.; *The Bell System Technical Journal;* **27**(4):623–656; 1948.

Synopsis

- **Lecture 1:** Probabilities, inference and information content
- **Lecture 2:** Entropy and probability distances
- **Lecture 3:** Maximising entropy and thermodynamics

Censorshi* is the s*ppression*of speech*
public c*mmunicat*on or ot*er infor*ation
which m*y be co*sidered*objecti*nable,*
harmfu*, sens*tive, *olitic*lly in*orrect*or
incon*enien* as d*termi*ed by*gover*ments*
medi* out*ets,*auth*riti*s or*othe* suc*
ent*tie*.

Go*er*me*ts* p*iv*te*or*an*za*io*s *nd
i*d*v*d*a*s*m*y*e*g*g* *n*c*n*o*s*i*.*W*e*
a**i**i**d**l**u** ** ** **t**r**r**t**r*
c***t***e***g***i***e***r***p*** ***i***w**
w**** ****p****,****i****l****s****
c*****s****

Censorship is the suppression of speech, public communication or other information which may be considered objectionable, harmful, sensitive, politically incorrect or inconvenient as determined by governments, media outlets, authorities or other such entities.

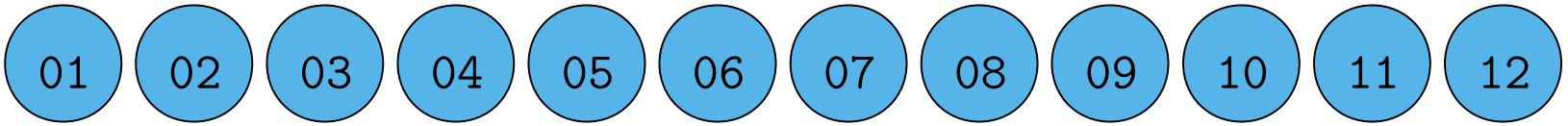
Governments, private organizations and individuals may engage in censorship. When an individual such as an author or other creator engages in censorship of their own works or speech, it is called self-censorship.

s ths th rl lf? s ths jst fntsy? Cght n lndsld, n scp frm rlty.

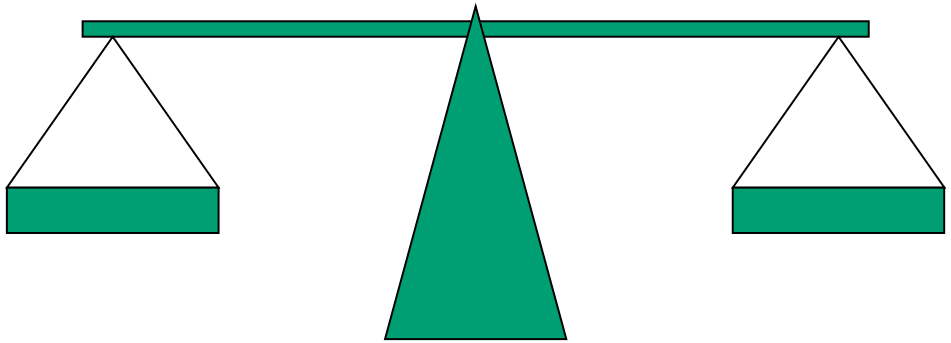
pn yr ys, lk p t th sks n s, 'm jst pr by, nd n sympthy, bcs 'm sy cm, sy g, lttl hgh, lttl lw, nywy th wnd blws dsn't rlly mttr to m, to m...

Probabilities, inference and information content

Weighing problem



12 balls, 1 is different weight to the others.



What is the minimum number of weighings needed to determine which is the odd ball and if it is lighter or heavier?

Course on Information Theory, Pattern Recognition, and Neural Networks

David J.C. Mackay

http://videolectures.net/course_information_theory_pattern_recognition/

Lectures: 1, **9** (second half), 10

Exercises: 22.1–4

Probability Theory
The Logic of Science

E.T. Jaynes

Chapter 12