

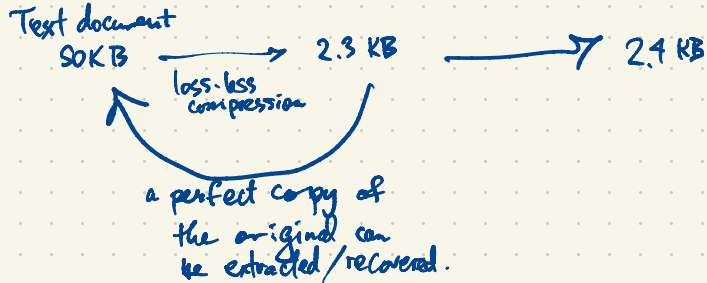
A 3D perspective view of a grid of rectangular blocks. Most blocks are grey, but one block in the upper-left quadrant is gold. The blocks are arranged in a staggered pattern, creating a sense of depth and perspective. The lighting is soft, casting gentle shadows between the blocks.

# **Information Theory**

**Book I**

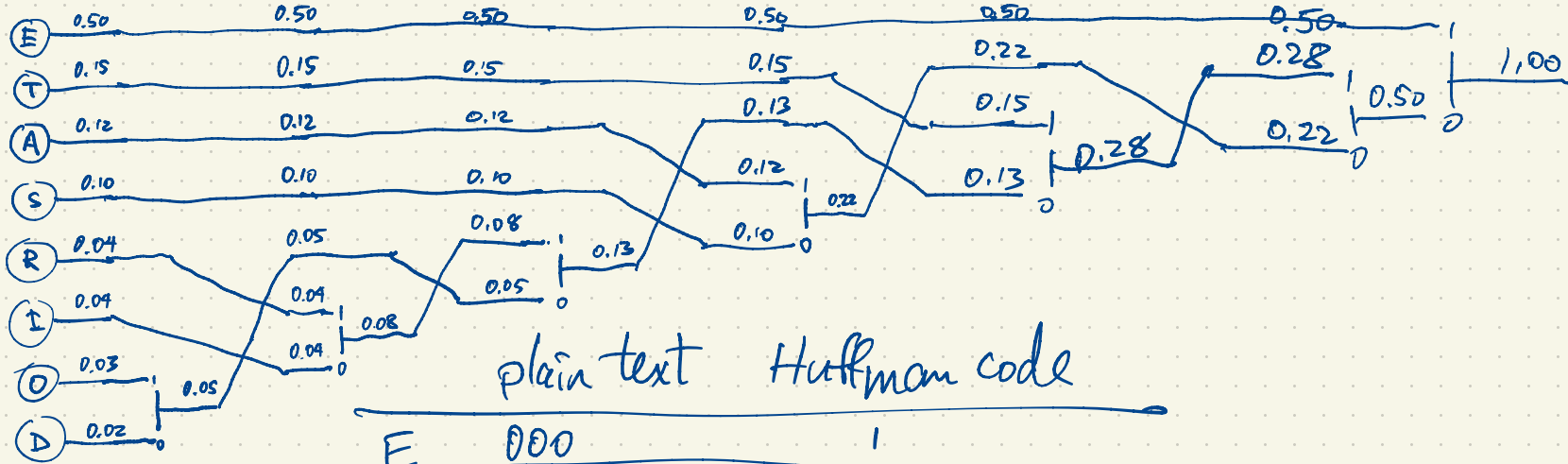
## Information theory:

- Shannon information (statistical measurement of information content; classical information theory)
- Kolmogorov information (algorithmic information)
- Quantum information



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Consider an information stream composed of E, T, A, S, R, I, O, D  
(stream of independent letters)      freq.      0.50, 0.15,      ..., 0.02



plain text      Huffman code

E	000	1
T	001	011
A	010	001
S	011	000
R	100	01011
I	101	01010
O	110	01001
D	111	01000

Huffman encoding:  
 Encode STEER as 000111101011  
 Decoding      S T E E R

A string of  $n$  characters is represented as  $3n$  bits (plain text) which the Huffman code compresses to  $2.26n$  bits (75.37% of original).