**Tutorial 12: Information Theory**

**LEARNING OUTCOME**

**By the end of this lesson a student will be able to:**

1. understand a concept of an entropy in information theory
2. generate a frequency monogram of English alphabets
3. build Huffman tree and encoding process on given symbols and pdf
4. compute an entropy from a probability density function

**0. Do this tutorial in pairs and submit one only.**

1. Collect an article or a passage of at least 2000 characters.

2. Count each alphabet excluding space character.

3. Draw a frequency plot or histogram on alphabets and space.

4. Convert its frequency into a sample pdf

5. Select the top ten characters according to their frequency distribution.

6. Build Huffman Tree on the top ten chars.

7. Encode each character as a binary Huffman string

8. Compute an average bit length of 10 chars

9. Compute an entropy on each symbols from 10 chars.

10 Compare your last 2 answers.