Information Theory

Lecture notes 2017-2018

Introduction

Organization

Professors:

- Lectures: Nicolae Cleju
- Laboratories: Nicolae Cleju

Grades

- Final grade $= 0.6$ Exam $+ 0.2$ Lab $+ 0.2$ Tests

Time schedule

- 14 weeks of lectures (3h each)
- 14 weeks of laboratories (2h each)
- Office hours: Wednesday 11:00 - 13:00 (best by appointment)

Exercises & Tests

- 3rd hour of each lecture = exercises
- There will be 3 semester tests in 5th, 8th and 11th week
- Exam: half exercises, half theory questions

Course structure

Bibliography

1. **Elements of Information Theory**, **Valeriu Munteanu, Daniela Tarniceriu, Ed. CERMI 2007**
2. *Elements of Information Theory*, Thomas M. Cover, Joy A. Thomas, 2nd Edition, Wiley 2006
3. *Transmisia si codarea informatiei*, lectures at ETTI (Romanian)
4. *Information and Coding Theory*, Gareth A. Jones, J. Mary Jones, Springer 2000

Review: probabilities

- ▶ Distribution (probability mass function)
- ▶ Discrete distribution
- ▶ Alphabet
- ▶ Random variable = the outcome of a random experiment
- ▶ Logarithm function
- ▶ Exponential function
- ▶ Average of some values

- Two independent events:

$$p(A \cap B) = p(A) \cdot p(B)$$