

- Information measures for e.g. communication and machine learning
- Channel models, capacity and channel coding theorem
- Convolutional codes, trellis codes
- Quantization and rate distortion theory

Initial competences

Communication theory: partim data communication

Final competences

- 1 Interpret and use information measures.
- 2 Compute theoretical bounds for channel coding and quantization.
- 3 Compute the optimal quantizer.
- 4 Analyse hard and soft decoding.
- 5 Recognize the graphical representation of codes.
- 6 Apply Viterbi decoding.
- 7 Apply error detection and error correction for soft and hard decoding.
- 8 Compute performance.

Conditions for credit contract

Access to this course unit via a credit contract is determined after successful competences assessment

Conditions for exam contract

This course unit cannot be taken via an exam contract

Teaching methods

Seminar, Lecture, Independent work

Study material

Type: Syllabus

Name: Information Theory

Indicative price: € 13

Optional: no

Language : English

Number of Pages : 440

Oldest Usable Edition : version of 2023

Available on Ufora : Yes

Online Available : Yes

Available in the Library : No

Available through Student Association : Yes

References

- J.G. Proakis: Digital Communications (McGraw-Hill), ISBN: 978-0072321111
- S. Benedetto, E. Biglieri : Principles of Digital Transmission (Kluwer Academic / Plenum Publishers), ISBN: 0306457539
- David J. C. MacKay: Theory, Inference and Learning Algorithms (Cambridge), ISBN: 780521644440

Course content-related study coaching

Assessment moments

end-of-term and continuous assessment

Examination methods in case of periodic assessment during the first examination period

Written assessment open-book

Examination methods in case of periodic assessment during the second examination period

Written assessment open-book

Examination methods in case of permanent assessment

Oral assessment, Assignment

Possibilities of retake in case of permanent assessment

examination during the second examination period is possible in modified form

Extra information on the examination methods

During examination period: written open book exam

During semester: graded reports group work and oral defense group work. Second chance: if score less than 8/20: oral examination

Calculation of the examination mark

Evaluation throughout semester as well as during examination period. Special conditions: To determine the total score, the following weights are used: examination: 80% and evaluation throughout semester (group work): 20%, if for none of the the parts a score of less than 8/20 was obtained. In case the student has less than 8/20 for one of the evaluation formats, the student cannot pass for the course. In that case, if the weighted score would be 10/20 or more, this will be reduced to 8/20. The score of the evaluation throughout the semester obtained in the first examination period counts in the second examination period for 20% of the total. In case the student is unjustified absent for the group work, the total score (exam + group work) will be maximally 7/20, irrespective of the score for the exam. If different group members clearly show a different degree of input to the group work, then the final mark per student belonging to the same group can still differ