

IMT4302 Coding and compression of media data - Study plans 2016-2017

Course code:

IMT4302

Course name:

Coding and compression of media data

Course level:

Master (syklus 2)

ECTS Credits:

7.5

Duration:

Vår

Language of instruction:

English

On the basis of:

Builds on some of the lectures in Image Processing and Analysis course - or similar.

Expected learning outcomes:

This course is a graduate-level introductory course to the fundamentals of coding and compression of media data. It focuses on the fundamental principles of coding and compression and discusses several of the existing audio, image and video compression standards. On completion of this course the student will:

Knowledge

- posses an understanding of the fundamental characteristics of data coding systems used widely in digital recording formats, software and hardware encoders.
- understand the human visual system characteristics and deficiencies that can be exploited to compress audio-visual media efficiently.
- understand the redundancies in audio-visual content and how to remove it when encoding this type of material.
- understand how subjective as well as objective metrics work, for the evaluation of media quality.
- possess advanced knowledge of basic algorithms for lossless and lossy audio, image and video compression techniques and standards including preprocessing, transforms-based coding, filtering, etc.
- posses advanced knowledge of video sequences and how they differ from still images and how to exploit their inherent redundancies to compress this type of data.
- possess specialized insight and good understanding of the different media coding standards and their differences.

Skills

- be able to use mathematical techniques for encoding different types of media and demonstrate the use of tools such as matlab, wavelets toolbox, to solve problems in data coding and compression.
- be able to explore a range of practical techniques, by developing their own simple encoding functions using library facilities and tools such as Matlab.
- be able to implement the techniques in the topics studied and compare their performances in certain coding tasks.
- be able to use relevant and suitable methods when carrying out research and development activities in the area of media coding.
- be able to present, to his colleagues and experts, his work in English and defend his ideas.

General competence

- have the learning skills to continue acquiring new knowledge and skills in a manner that is largely self-directed.
- be able to contribute to innovative thinking and innovation processes.

Topic(s):

- Motivation for media data compression
- Media data redundancy and compression
- Fundamental digital image representation and processing
- Sampling and quantization
- Entropy coding, run-length coding, variable-length coding
- Lossy and lossless compression techniques
- Transform-based coding
- Compression of audio, image, and video data
- File formats and standards
- JPEG, JPEG2000
- Motion estimation, motion compensation, motion compensated prediction
- H.261, H.263, MPEG-1, MPEG-2, MPEG-4, MPEG-7, and newer coding standards
- Image quality

Teaching Methods:

Lectures

Net Support Learning

Exercises

Project work

Teaching Methods (additional text):

The course will be offered both as an ordinary on-campus course and as a flexible course to off-campus students. Lecture notes in PDF, Audio recordings of the lectures and other types of e-learning material will be offered through Fronter. Communication between the teacher and the students, and among the students, will be facilitated via Fronter.

Form(s) of Assessment:

Written exam, 4 hours

Grading Scale:

Alphabetical Scale, A(best) – F (fail)

External/internal examiner:

Internal examiner evaluates the written exam.

Re-sit examination:

Ordinary re-sit examination in August.

Tillatte hjelpemidler:

D: Ingen trykte eller håndskrevne hjelpemidler tillatt. Bestemt, enkel kalkulator tillatt.

Examination support:

English dictionary

Coursework Requirements:

Mandatory exercises reports (these will not be graded).

Academic responsibility:

Faculty of Computer Science and Media Technology

Emneansvarlig kobling:

[Faouzi Alaya Cheikh](#)

Course responsibility:

Førsteamanuensis Faouzi Alaya Cheikh

Teaching Materials:

TBA

Replacement course for:

IMT4451 Coding and compression of media data

Additional information:

The course will run for the first time in 2017.

Publish:

Yes