

## IMT4302 Koding og komprimering av mediedata - 2016-2017

**Emnekode:**

IMT4302

**Emnenavn:**

Koding og komprimering av mediedata

**Faglig nivå:**

Master (syklus 2)

**Studiepoeng:**

7.5

**Varighet:**

Vår

**Språk:**

Engelsk

**Anbefalt forkunnskap:**

IMT4202 Image Processing and Analysis

**Forventet læringsutbytte:**

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.

**Emnets temaer:**

- 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

**Pedagogiske metoder:**

Forelesninger

Nettstøttet læring

Oppgaveløsning

Prosjektarbeid

**Pedagogiske metoder (fritekst):**

Emnet tilbys både som et ordinært campus-emne og som et emne som tilbys fjernstudenter på en fleksibel måte. Forelesningsnotater, e-forelesninger og andre typer av e-læringsmateriell vil bli tilbuddt gjennom en læringsplattform. Kommunikasjon mellom lærere og studenter, og mellom studenter, vil bli understøttet av læringsplattform.

**Vurderingsformer:**

Skriftlig eksamen, 4 timer

**Karakterskala:**

Bokstavkarakterer, A (best) - F (ikke bestått)

**Sensorordning:**

Intern sensor vurderer alle besvarelser

**Utsatt eksamen (tidl. kontinuasjon):**

Kontinuasjon/utsatt eksamen august 2017.

**Tillatte hjelpeemidler:**

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

**Tillatte hjelpeemidler (gjelder kun skriftlig eksamen):**

Godkjent kalkulator

Engelsk ordliste

**Obligatoriske arbeidskrav:**

Obligatoriske øvingsoppgaver

**Ansvarlig avdeling:**

Avdeling for informatikk og medieteknikk

**Emneansvarlig kobling:**

[Faouzi Alaya Cheikh](#)

**Emneansvarlig:**

Førsteamansen Faouzi Alaya Cheikh

**Læreremidler:**

Oppgis ved semesterstart

**Erstatter:**

IMT4451 Koding og komprimering av mediedata

**Klar for publisering:**

Ja

**Emneside (URL):**

<http://www.hig.no/imt/mt/emnesider/imt4451>