

230204 - DRCAV - Description and Retrieval of Audiovisual Content

Coordinating unit:	230 - ETSETB - Barcelona School of Telecommunications Engineering		
Teaching unit:	739 - TSC - Department of Signal Theory and Communications 701 - AC - Department of Computer Architecture		
Academic year:	2019		
Degree:	BACHELOR'S DEGREE IN AUDIOVISUAL SYSTEMS ENGINEERING (Syllabus 2009). (Teaching unit Optional) BACHELOR'S DEGREE IN TELECOMMUNICATIONS TECHNOLOGIES AND SERVICES ENGINEERING (Syllabus 2015). (Teaching unit Optional)		
ECTS credits:	6	Teaching languages:	English

Teaching staff

Coordinator:	RUBEN TOUS LIESA
Others:	RUBEN TOUS LIESA CLIMENT NADEU CAMPRUBI JAVIER RUIZ HIDALGO

Prior skills

Basic knowledge of programming, along with processing and coding of audio and video signals.

Requirements

Second year.

Degree competences to which the subject contributes

Transversal:

1. SELF-DIRECTED LEARNING - Level 3. Applying the knowledge gained in completing a task according to its relevance and importance. Deciding how to carry out a task, the amount of time to be devoted to it and the most suitable information sources.

Teaching methodology

Theory + application classes: Development of concepts from examples and problems.

Laboratory classes: Development of practices based on a case to solve, using existing resources. Analysis of specific problems.

Learning objectives of the subject

Provide the necessary tools to analyze and describe audiovisual content, and for developing systems for storage and retrieval of audiovisual content.



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Study load

Total learning time: 150h	Hours large group:	39h	26.00%
	Hours small group:	13h	8.67%
	Self study:	98h	65.33%

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Content

<p>Audiovisual databases</p>	<p>Learning time: 16h Theory classes: 6h Laboratory classes: 10h</p>
<p>Description:</p> <ul style="list-style-type: none"> - Data and information retrieval: Structured vs. non-structured information; textual vs. audiovisual non-structured information. - Data modelling, relational databases, XML and the Semantic Web. - Non-SQL databases, scalable data storage and processing, big data. 	
<p>High-level description of audiovisual content</p>	<p>Learning time: 8h Theory classes: 6h Laboratory classes: 2h</p>
<p>Description:</p> <ul style="list-style-type: none"> - Multimedia metadata, high-level vs. low-level description of audiovisual content. - Multimedia metadata modeling, serialization and embedding (EXIF, MPEG-7, ontologies, etc.). 	
<p>Low-level description of audiovisual content Low-level description of audiovisual content</p>	<p>Learning time: 8h Theory classes: 4h Laboratory classes: 4h</p>
<p>Description:</p> <ul style="list-style-type: none"> - Low-level descriptors of audiovisual content. Standards: MPEG7 and other. - Extraction of low-level audio descriptors (pitch, timbre, rhythm, etc.). - Extraction of low-level descriptors of image (color, shape, texture, etc.) and video (motion, localization, etc.). 	
<p>Retrieval and classification of audiovisual content</p>	<p>Learning time: 16h Theory classes: 8h Laboratory classes: 8h</p>
<p>Description:</p> <ul style="list-style-type: none"> - Classification and retrieval using low-level descriptors. Performance evaluation. Commercial applications. - Application to music information retrieval: fingerprinting, melody extraction, chord recognition, genre classification, etc. - Application to face detection, recognition, verification, video retrieval, etc. 	

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Qualification system

- Evaluation of part 1 (50%, topics 1 and 2):
 - Attendance and participation 10%
 - Laboratory assignments 20%
 - Project assignment 70%
- Evaluation of part 2:
 - Audio part (25%, topics 3 and 4):
 - Attendance and participation 10%
 - Laboratory assignments 20%
 - Project assignment 70%
 - Video part (25%, topics 3 and 4):
 - Attendance and participation 10%
 - Laboratory assignments 30%
 - Project assignment 60%

Regulations for carrying out activities

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Bibliography

Basic:

Manjunath, B. S.; Salembier, P.; Sikora, T. Introduction to MPEG 7: Multimedia Content Description Language. John Wiley, 2002. ISBN 0471486787.

Benois-Pineau, J.; Precioso, F.; Cord, M. Visual Indexing and Retrieval [on line]. New York [etc.]: Springer, 2012 [Consultation: 17/10/2014]. Available on: <<http://lib.mylibrary.com/Open.aspx?id=370364>>. ISBN 9781461435884.

Kim, H.G.; Moreau, N.; Sikora, T.. MPEG-7 audio and beyond: audio content indexing and retrieval. John Wiley, 2005. ISBN 047009334X.

Ricardo Baeza-Yates, Berthier Ribeiro-Neto. Modern information retrieval. 2nd ed. Harlow: Addison Wesley / pearson, 2011. ISBN 9780321416919.

Sistac, J. Bases de dades. Editorial UOC, S.L., 2005. ISBN 8497883349.