

230207 - BIOTEC - Biometric Technologies

Coordinating unit: 230 - ETSETB - Barcelona School of Telecommunications Engineering
 Teaching unit: 739 - TSC - Department of Signal Theory and Communications
 Academic year: 2015
 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: JAVIER HERNANDO

Others: XAVIER GIRÓ

Requirements

PIV, PAV.

Teaching methodology

- Lectures
- Laboratory classes
- Group work (distance)
- Oral presentations
- Short answer test (Control)
- Extended answer test (Final Exam)

Learning objectives of the subject

In this course principles and methods of biometric systems will be presented to the student. The course will also cover the state-of-the-art techniques in audio, image and video technologies.

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>1. Introduction</p>	<p>Learning time: 6h Theory classes: 2h Self study : 4h</p>
<p>Description: Definitions, examples, applications.</p>	
<p>2. Pattern Classification</p>	<p>Learning time: 18h Theory classes: 4h Laboratory classes: 2h Self study : 12h</p>
<p>Description: - Definitons, applications, basic concepts. - Architecture: features, classifiers. - Discriminative, un/supervised algorithms.</p>	
<p>3. System Architecture and Assessment</p>	<p>Learning time: 13h Theory classes: 3h Laboratory classes: 2h Self study : 8h</p>
<p>Description: - System architecture. - Performance criteria.</p>	
<p>4. Speaker Recognition</p>	<p>Learning time: 34h Theory classes: 9h Laboratory classes: 3h Self study : 22h</p>
<p>Description: - Text dependent and text independent system. - Speech features. - Speaker models: GMM, HMM, discrimitative approaches.</p>	

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5. Main Image Biometrics	Learning time: 51h Theory classes: 13h Laboratory classes: 4h Self study : 34h
Description: - Face recognition. - Iris recognition. - Fingerprint recognition. - Other image-based modalities.	
6. Multimodal Biometrics	Learning time: 16h Theory classes: 4h Laboratory classes: 2h Self study : 10h
Description: - Signal, feature, score and decision levels. - Normalization and fusion.	
7. Other Biometrics	Learning time: 12h Theory classes: 4h Self study : 8h
Description: Other biometrics: technologies and applications.	

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Planning of activities

LABORATORY

Description:
Algorithm implementation and testing.

GROUP

Description:
Bibliographic research.

ORAL PRESENTATION

Description:
Presentation of the group work.

SHORT ANSWER TEST (CONTROL)

Description:
Multiple choice test.

EXTENDED ANSWER TEST (FINAL EXAMINATION)

Description:
Discussion of concepts.

Qualification system

Final examination: 40%
Partial examinations and controls: 20%
Exercises: 25%
Laboratory assessments: 15%

Bibliography

Basic:

Wayman, J. [et al.]. Biometric systems: technology, design and performance evaluation. London: Springer, 2005. ISBN 1852335963.

Complementary:

Bolle, R.M. [et al.]. Guide to biometrics. New York: Springer, 2004. ISBN 0387400893.