230624 - BIOM - Biometrics

Coordinating unit: 230 - ETSETB - Barcelona School of Telecommunications Engineering
Teaching unit: 739 - TSC - Department of Signal Theory and Communications
Academic year: 2020
Degree: MASTER’S DEGREE IN ADVANCED TELECOMMUNICATION TECHNOLOGIES (Syllabus 2019).
(Teaching unit Optional)
MASTER’S DEGREE IN TELECOMMUNICATIONS ENGINEERING (Syllabus 2013). (Teaching unit Optional)
ECTS credits: 5
Teaching languages: English

Teaching staff
Coordinator: JAVIER HERNANDO
Others: Sayrol Clols, Elisa

Degree competences to which the subject contributes

Specific:
1. Ability to apply information theory methods, adaptive modulation and channel coding, as well as advanced techniques of digital signal processing to communication and audiovisual systems.

Transversal:
2. EFFECTIVE USE OF INFORMATION RESOURCES: Managing the acquisition, structuring, analysis and display of data and information in the chosen area of specialisation and critically assessing the results obtained.
3. FOREIGN LANGUAGE: Achieving a level of spoken and written proficiency in a foreign language, preferably English, that meets the needs of the profession and the labour market.

Teaching methodology

- Lectures
- Individual work (distance)
- Oral presentations
- Extended answer tests

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, including Deep Learning

Study load

<table>
<thead>
<tr>
<th>Total learning time: 125h</th>
<th>Hours large group: 39h</th>
<th>31.20%</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Self study: 86h</td>
<td>68.80%</td>
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</table>
### 1. Introduction

- **Description:** Definitions, examples, applications

- **Learning time:** 4h
  - Theory classes: 2h
  - Self study: 2h

### 2. System Architecture and Assessment

- **Description:** System architecture: features, classifiers
  - Performance criteria

- **Learning time:** 9h
  - Theory classes: 3h
  - Self study: 6h

### 3. Face recognition

- **Description:** Face detection
  - Face recognition

- **Learning time:** 18h
  - Theory classes: 6h
  - Self study: 12h

### 4. Fingerprint recognition

- **Description:**

- **Learning time:** 9h
  - Theory classes: 3h
  - Self study: 6h

### 5. Iris recognition

- **Description:**

- **Learning time:** 9h
  - Theory classes: 3h
  - Self study: 6h
6. **Speaker recognition**

**Description:**
- Identification and verification
- Diarization

**Learning time:** 18h  
Theory classes: 6h  
Self study: 12h

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7. **Other biometrics**

**Description:**
- Signature
- Hand geometry
- Keystroke
- Others

**Learning time:** 44h 40m  
Theory classes: 8h 40m  
Self study: 36h

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8. **Multimodal biometrics**

**Description:**
- Fusion levels
- Normalization and fusion

**Learning time:** 8h  
Theory classes: 2h  
Self study: 6h
### Planning of activities

<table>
<thead>
<tr>
<th>Activity</th>
<th>Hours:</th>
<th>Theory classes:</th>
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</thead>
<tbody>
<tr>
<td><strong>Partial control</strong></td>
<td>2h</td>
<td>2h</td>
</tr>
<tr>
<td><strong>Oral presentation of individual work</strong></td>
<td>0h 20m</td>
<td>0h 20m</td>
</tr>
<tr>
<td><strong>Final exam</strong></td>
<td>3h</td>
<td>3h</td>
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**Description:**
Final examination.

### Qualification system

Partial exam 1: 25%
Partial exam 2: 25%
Assignment and oral presentation: 25%
Practices: 25%

If all the marks are bigger than 3.5 and the weighted average is bigger than 5, passed
Otherwise,
Final exam: 50%
Assignment and oral presentation: 25%
Practices: 25%

### Bibliography

**Basic:**

**Complementary:**