

PEOPLE DETECTION AND BIOMETRIC RECOGNITION

1. SYLLABUS INFORMATION

1.1. Course title

People Detection and Biometric Recognition

1.2. University

Universidad Autónoma de Madrid

1.3. Semester

First year, second semester

2. COURSE DETAILS

2.1. Course nature

Optional

2.2. ECTS Credit allotment

6

2.3. Recommendations

It is useful to have previous knowledge in linear systems, digital signal processing, speech and audio processing, random processes and signals, and statistical pattern recognition.

Related subjects are:

- Introduction to the Analysis of Video Sequences
- Machine Learning: theory and applications
- Applied Bayesian Methods
- Temporal Information Processing
- Biomedical signal processing and its applications

2.4. Faculty data

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3. COMPETENCES AND LEARNING OUTCOMES

3.1. Course objectives

This subject will describe the basic technologies behind automatic and semi-automatic person recognition, verification, and identification based on biometric signals or images captured from the Physiology or the behavior of the people. The first unit of the subject will focus on people detection on images and video sequences, including the most important challenges and its solutions. The second unit of the signature will be focused on specific technologies for different biometric modalities such as fingerprint, face, or iris images; with practical applications in the areas of security and forensic science.

3.2. Course contents

Both Units are divided into the following topics:

1. People detection in image/video

- 1.1. Introduction to people detection in video sequences
- 1.2. People detection systems
- 1.3. Critical factors and current solutions
- 1.4. Performance evaluation

2. Biometric Person Recognition

- 2.1. Face recognition
- 2.2. Fingerprint recognition
- 2.3. Iris recognition
- 2.4. Signature/handwriting recognition
- 2.5. Speaker recognition
- 2.6. Fusion in Biometrics
- 2.7. Forensic Biometrics
- 2.8. Security Aspects in Biometrics

3.3. Course bibliography

- S.A. Velastin, P. Remagnino, "Intelligent Distributed Video Surveillance Systems", IET, 2006
- O. Javed, M. Shah, "Automated Multi-camera Surveillance: Algorithms and Practice", Springer 2008
- E. Maggio, A. Cavallaro, "Video Tracking: Theory and Practice", Wiley, 2011.
- Selected papers in relevant journals and conferences for topics covered in the course

- Pradeep K. Atrey, Mohan S. Kankanhalli, Andrea Cavallaro, "Intelligent Multimedia Surveillance: Current Trends and Research", Springer 2013
- Introduction to Biometrics, A. K. Jain, Arun A. Ross, and Karthik Nandakumar, Springer, 2011.
- Handbook of Biometrics, A. K. Jain, Patrick J. Flynn, and Arun A. Ross (Eds.), Springer, 2010.
- Handbook of Fingerprint Recognition, Davide Maltoni, Dario Maio, Anil K. Jain, and Salil Prabhakar, Springer, 2009.

4. TEACHING-AND-LEARNING METHODOLOGIES AND STUDENT WORKLOAD

4.1. Contact hours

	Hours
Classroom instruction (minimum 33%)	64
Independent study time	86

4.2. List of training activities

Activity		Hours	%	Hours	%
Presential	Lecture sessions	24	16	56	37,33
	Practical programming sessions	28	18,6		
	Tests and exams	4	2,6		
Non-presential	Weekly study of lectures	24	16	94	62,66
	Practical work (programming and reporting)	60	40		
	Preparation of tests and exams	10	6,6		
TOTAL WORKLOAD: 25 hours x 6 ECTS		150	100	150	100

5. EVALUATION PROCEDURES AND WEIGHT OF COMPONENTS IN THE FINAL GRADE

5.1. Regular assessment

The course involves lectures and laboratory sessions. It involves two theoretical evaluations (one per module, TE-1 and TE-2) and two evaluations of the practical work (one per module, PR-1 and PR-2).

In both the ordinary and the extraordinary exam period it is necessary to have a pass grade (≥ 5) in all the theoretical evaluations (TE-1 and TE-2), and positive evaluations of the laboratory work (PR-1 and PR-2).

The grades of the individual parts are kept for the extraordinary exam period.

5.2. List of evaluation activities

In the ordinary exam period, the evaluation will be made according to the following scheme:

- 60% exam (mean of TE-1 and TE-2; minimum grade: 5 in both).
- 40% laboratory work (mean of PR-1 and PR-2 minimum grade: 5 in both). This part has to be passed before the end of the ordinary exam period unless a truly justified reason exists, otherwise the subject will be failed also in the extraordinary exam period.