

ES4E9-15 Affective Computing

20/21

Department

School of Engineering

Level

Undergraduate Level 4

Module leader

Tardi Tjahjadi

Credit value

15

Module duration

10 weeks

Assessment

60% coursework, 40% exam

Study location

University of Warwick main campus, Coventry

Description

Introductory description

Affective Computing is the inter-disciplinary study and development of systems that can recognise and interpret human affects (emotion). Information gathered from various sensors (e.g., video camera, speech detector and electroencephalogram (EEG)) are processed to recognise the appropriate affect responses.

[Module web page](#)

Module aims

This module aims to introduce: theoretical underpinnings (psychological, physiological and technological) of affect recognition; affect sensing involving signal processing, computer vision and machine learning; and the design and implementation of effective human-machine interface applications such as health monitoring, deception detection, gaming experience and learning technologies.

Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

Theoretical underpinnings of affective computing from an interdisciplinary perspective encompassing the affective, cognitive, social, media, and brain sciences.

Affect recognition from facial expressions, body language, speech, physiology, contextual features, and multimodal combinations of these modalities.

Applications of affective computing in human-robot interactions, unobtrusive deception detection and health monitoring.

Learning outcomes

By the end of the module, students should be able to:

- Integrate theories from multiple disciplines (Computer Science / Engineering / Psychology) in order to explain the main concepts of affective computing.
- Evaluate and implement the principles of automated facial expression recognition.
- Analyse and implement the principles of automated body language recognition
- Examine the principles of physiology for affective computing.
- Critique the applications of affective computing in human-robot interactions, unobtrusive deception detection and health monitoring.

Indicative reading list

Calvo RA, D'Mellor SK, Gratch J, Kappas A (Eds), The Oxford Handbook of Affective Computing, Oxford University Press, 2015, ISBN: 9780199942237.

Peter C, Beale R (Eds), Affect and Emotion in Human Computer Interaction: From Theory to Applications, Springer, 2008, ISBN: 9783540850984.

Picard R, Affective Computing, MIT Press, 2000, ISBN: 9780262661157.

Subject specific skills

1. Ability to conceive, make and realise a component, product, system or process.
2. Ability to be pragmatic, taking a systematic approach and the logical and practical steps necessary for, often complex, concepts to become reality.
3. Ability to seek to achieve sustainable solutions to problems and have strategies for being creative and innovative.

Transferable skills

1. Numeracy: apply mathematical and computational methods to communicate parameters, model and optimize solutions.
2. Apply problem solving skills, information retrieval, and the effective use of general IT facilities.
3. Ability to formulate and operate within appropriate codes of conduct, when faced with an ethical issue.

4. Appreciation of the global dimensions of engineering, commerce and communication.

Study

Study time

Type	Required
Lectures	25 sessions of 1 hour (17%)
Seminars	5 sessions of 1 hour (3%)
Tutorials	3 sessions of 1 hour (2%)
Demonstrations	1 session of 3 hours (2%)
Private study	114 hours (76%)
Total	150 hours

Private study description

114 hours guided independent learning.

Costs

No further costs have been identified for this module.

Assessment

You must pass all assessment components to pass the module.

Assessment group D3

Assessment component	Weighting	Study time	Eligible for self-certification
Laboratory-based report	15%		No
1 laboratory-based report 1000 Words (excluding figures)			

Reassessment component is the same

	Weighting	Study time	Eligible for self-certification
Assessment component			
Seminar Quiz Seminar Quiz (4 pages)	15%		No
Reassessment component is the same			
Assessment component			
Assignment assignment	30%		No
Reassessment component is the same			
Assessment component			
Online Examination QMP ~Platforms - QMP	40%		No

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- Online examination: No Answerbook required
 - Students may use a calculator
 - Engineering Data Book 8th Edition
 - Graph paper

Reassessment component is the same

Feedback on assessment

Laboratory report: mark and comments; Seminar quiz: mark and comments; Written examination: mark. Cohort level feedback on examinations.

[Past exam papers for ES4E9](#)

Availability

Courses

This module is Optional for:

- Year 1 of TESA-H800 Postgraduate Taught Biomedical Engineering

This module is Option list A for:

- Year 4 of UESA-H114 MEng Engineering
- Year 4 of UESA-HH31 MEng Systems Engineering

This module is Option list B for:

- Year 4 of UCSA-G408 Undergraduate Computer Systems Engineering