Rising to challenges in assessment and feedback in HCI education: a peer-supported approach

Adriana Wilde
BCompSc(Hons) PGCE(PCET) MSc MIfL FHEA

October 2019

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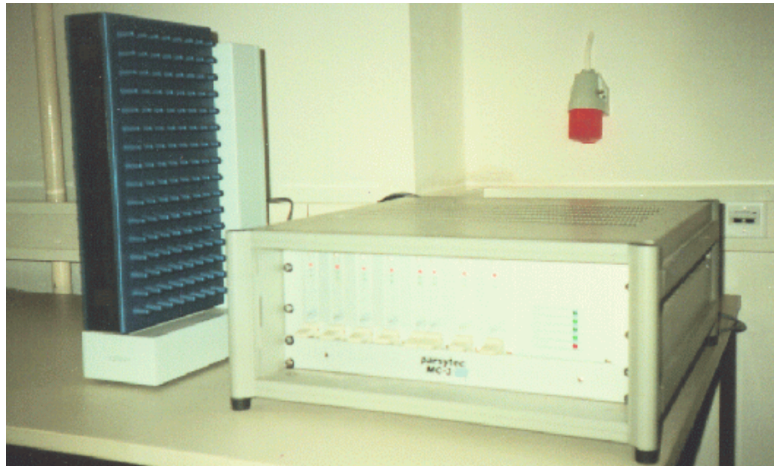
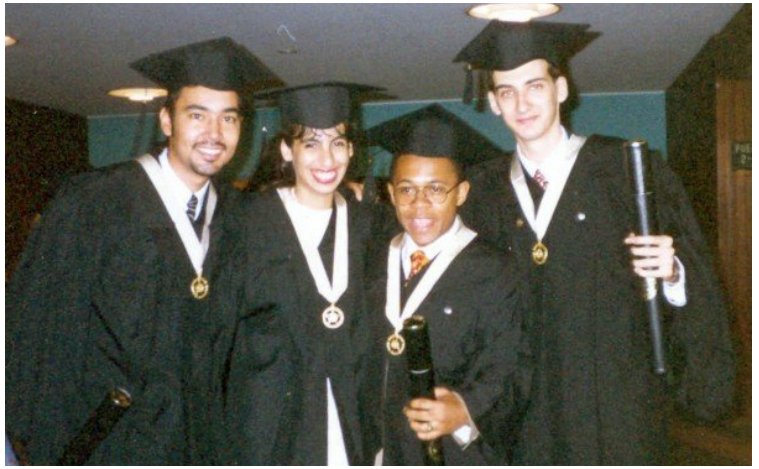
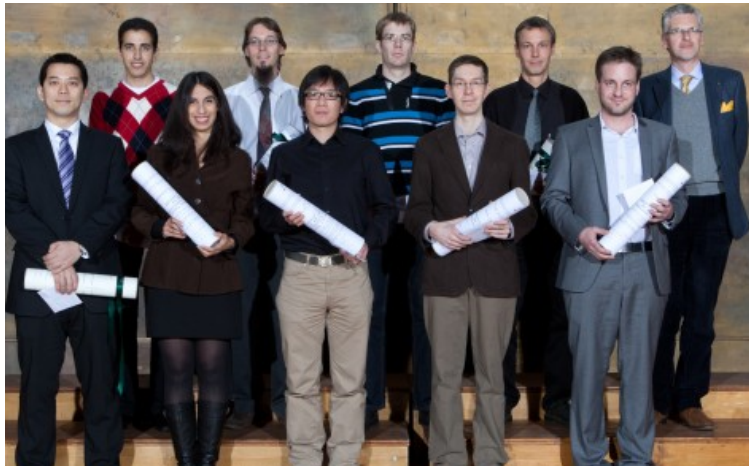
UNIVERSITY OF Southampton

WHO AM I?







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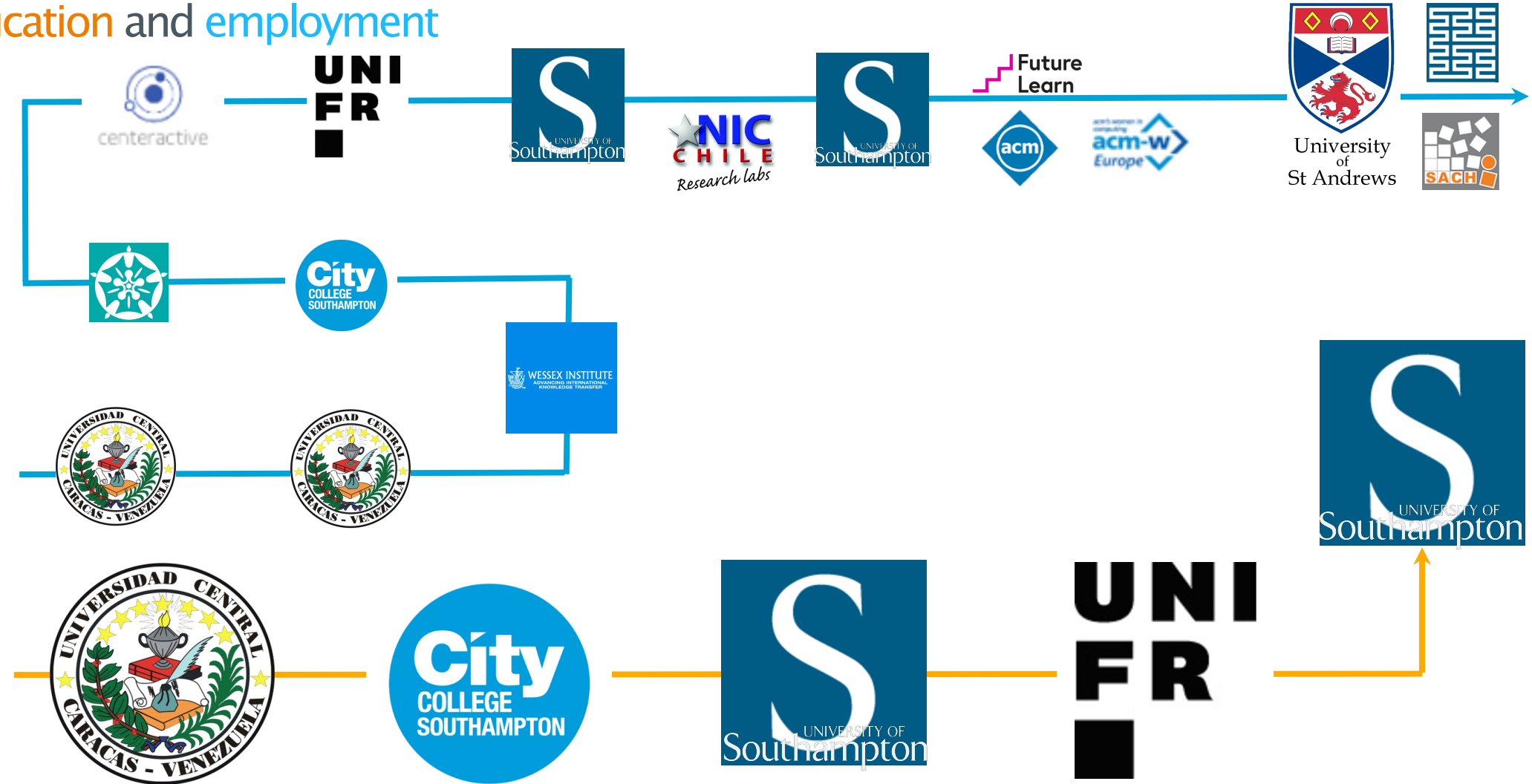
MY HISTORY

Education and employment



MY HISTORY

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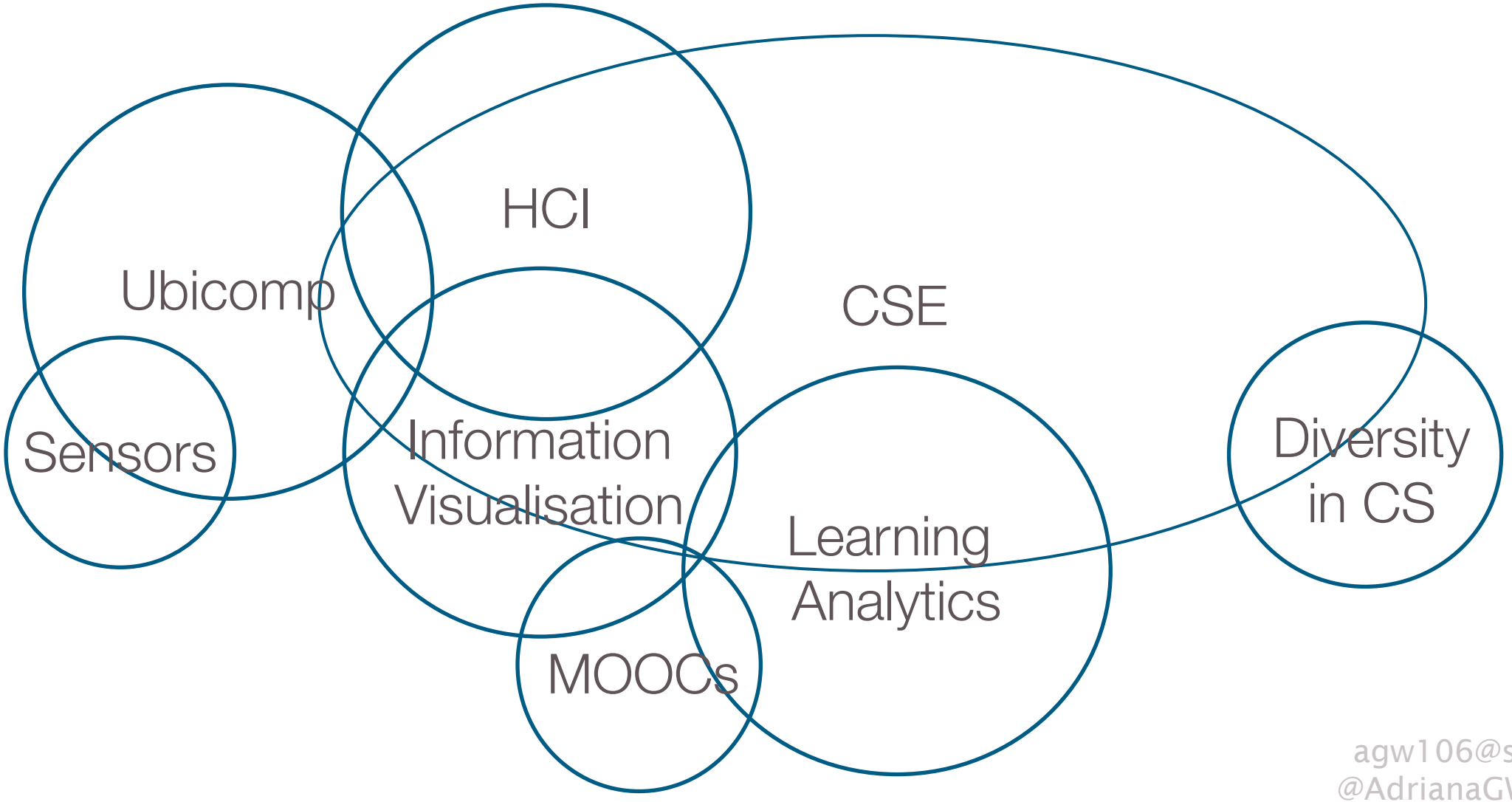
MY RESEARCH INTERESTS



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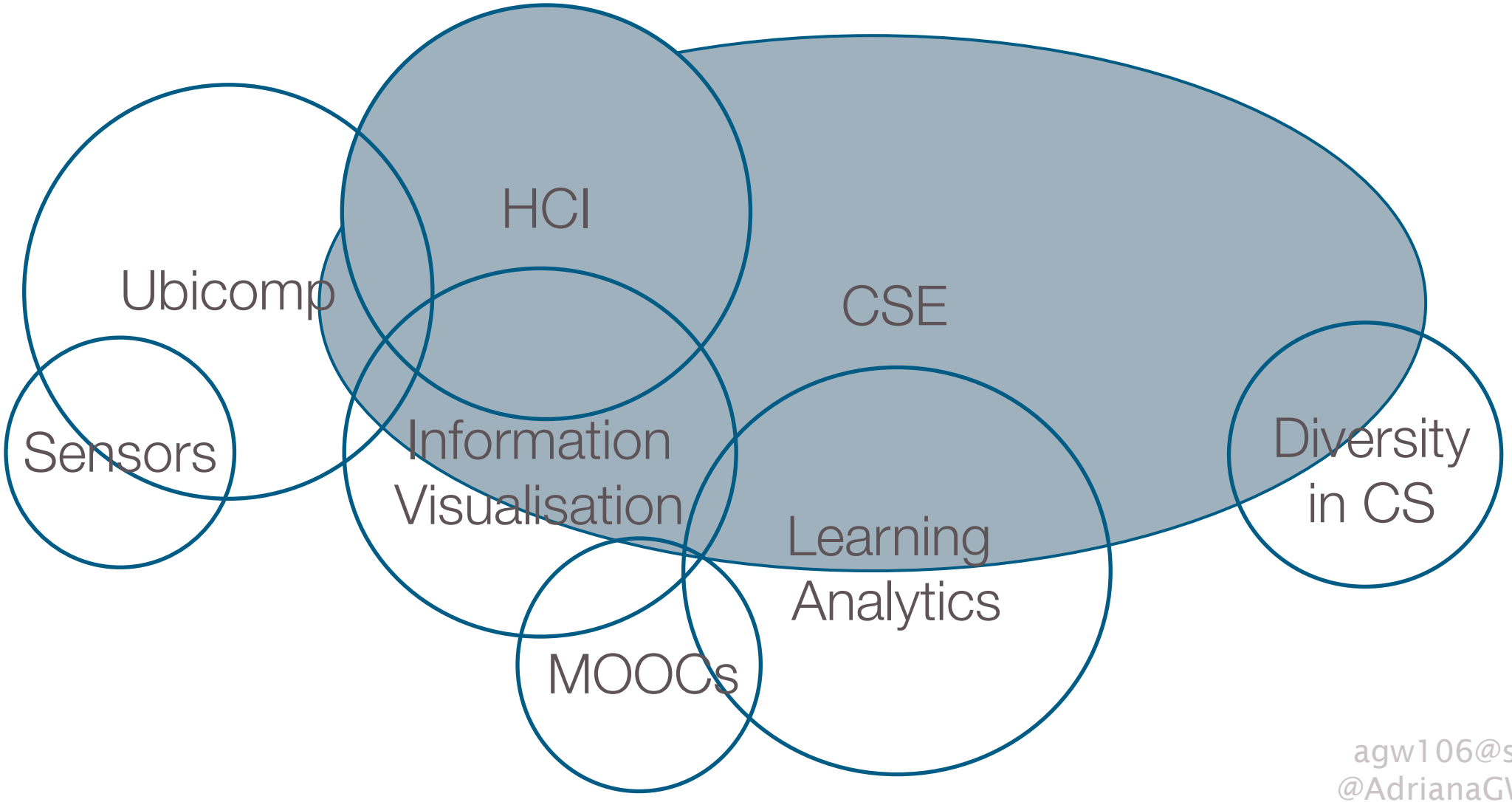

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Computer Science Education Learning Analytics Pervasive Computing Internet of Things

MY RESEARCH INTERESTS

TITLE	CITED BY	YEAR
Smart textiles for smart home control and enriching future wireless sensor network data O Ojuroye, R Torah, S Beeby, A Wilde Sensors for Everyday Life, 159-183	14	2017
An Overview of Human Activity Detection Technologies for Pervasive Systems A Wilde https://diuf.unifr.ch/main/pai/sites/diuf.unifr.ch.main.pai/files …	14	2010
Reprogramming embedded systems at run-time R Oliver, A Wilde, E Zaluska Proceedings of the International Conference on Sensing Technology, ICST	12	2014
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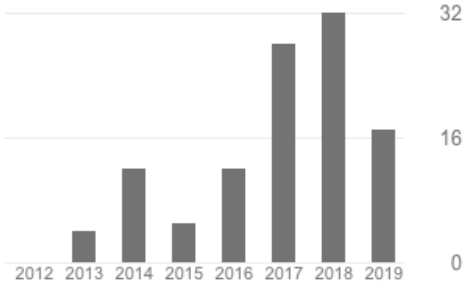
	All	Since 2014
Citations	116	106
h-index	5	5
i10-index	4	3



Co-authors VIEW ALL

- Ed Zaluska — Electronics and Computer Scien…
- Russel Torah — Senior Researcher, University of …
- SP Beeby — University of Southampton
- Manuel León Urrutia — University of Southampton
- Anna Vasilchenko — Ph.D. student, Newcastle Univer…
- Ruth Cobos — Universidad Autonoma de Madrid
- Pascal Bruegger — Professor of computer science, …
- Alan Dix — Professor and Director of the Co…
- Hugh Davis — Professor of Learning Technologi…

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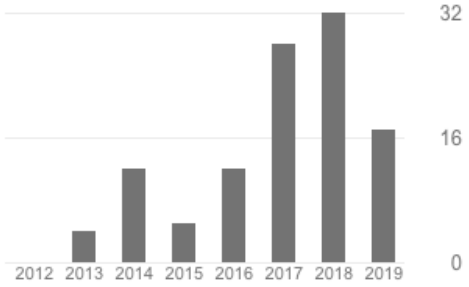

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BEFORE I START

Disclaimer: I've given (versions of) this talk before

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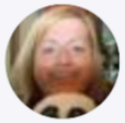

dmeharg @dmeharg Jan 12, 2018

Interesting talk by @AdrianaGWilde looking at the 'holy grail' of assessment **@CEP2018** .

1

Not Secure | community.dur.ac.uk/cep.conference/2018/programme.php

CEP Submissions Dates Programme Registration Location Contact

Addressing challenges in assessing Human-Computer Interaction at scale

Adriana Wilde
University of St Andrews
Steve Snow
University of Southampton

Human-Computer Interaction (HCI) is a research area which studies how people interact with computer systems. Because of its multidisciplinary nature, HCI modules often sit at unease within the computer science curriculum which is primarily composed by modules typically assessed through objective measures, using quantitative methods. Assessment criteria of HCI topics need to make some subjective measures quantifiable (e.g. aesthetics and creativity). In the case of large classes, it is critical that the assessment can scale appropriately without compromising on the validity of the judgment of how well the learning outcomes have been achieved.

In the HCI module 'Interaction Design' at the University of Southampton, faced with increasing student numbers (from less than 80 to over 160 in two years), lecturers redesigned the assessment to provide timely feedback. The module is assessed by exam and coursework, where the exam includes a large section composed of multiple-choice questions (MCQs). In order to foster higher-order learning, students were encouraged to author MCQs using the platform PeerWise, which proved to be used as a revision aid towards the exam.

In the coursework, students are required to conduct qualitative research, which in turns informs the creation of prototypes for technical solutions to problems from diverse areas of interest. Providing student such diversity of choices encourages creativity and freedom, as well as their application of the theoretical background of human-computer interaction.

This presentation explains the authors' approach to assessment, both in supporting the creation of MCQs and exam revision, as well as in how the medium of video allowed for the expression of creativity and application of knowledge, whilst allowing for considerable ease of marking compared with traditional alternatives, which allowed for the provision of timely feedback to students.

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Rising to challenges in assessment and feedback in HCI education: a peer-supported approach

Snow, Wilde, Denny & schraefel (2019). A discursive question: Supporting student-authored multiple-choice questions through peer-learning software in non-STEMM disciplines. British Journal of Educational Technology, 50 (4), 1815-1830.

Wilde & Snow (2018). Addressing challenges in assessing Human-Computer Interaction at scale. In *Computing Education Practice*. 11-12 January, Durham, UK.

Snow & Wilde (2017) Supporting authoring of Multiple-Choice Questions in Human-Computer Interaction using PeerWise. In *What works in assessment and feedback: Simply better* conference. 14 September, Southampton, UK.

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Deconstructing the title …

Rising to challenges in assessment and feedback in HCI education: a peer-supported approach

- Assessing deep learning *or* memorisation?
- Knowledge *or* skills?
- Group work *or* individual work?

Deconstructing the title …

Rising to challenges in assessment and feedback in HCI education: a peer-supported approach

- Formative *or* summative feedback?
- Detailed, personalised, *and* timely feedback?

Deconstructing the title …

Rising to challenges in assessment and feedback in HCI education: a peer-supported approach

- Scalability
- Managing expectations
- The holy grail of assessment:
  - easy to set
  - hard to do
  - easy to mark

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CHALLENGE OF SCALABILITY

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http://www.virtualmusicoffice.com/computer-lecture-hall/

CHALLENGE OF SCALABILITY

https://twitter.com/AdrianaGWilde/status/1050377708499333120/photo/1

http://futurevisiontraining.co.uk/

http://www.virtualmusicoffice.com/computer-lecture-hall/

Deconstructing the title …

Rising to challenges in assessment and feedback in HCI education: a peer-supported approach

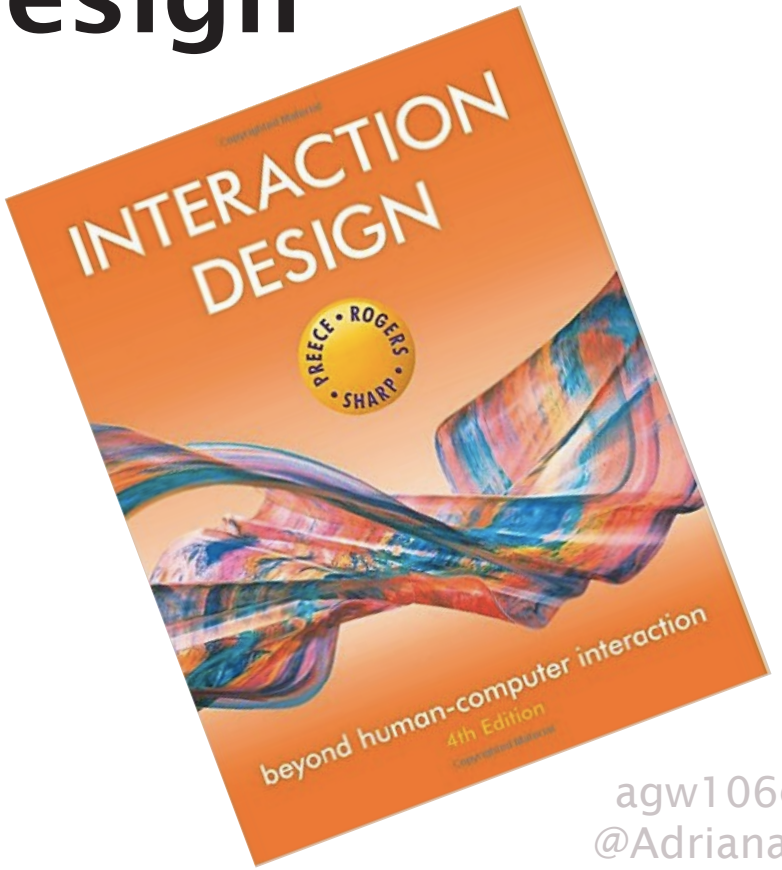
The study of how people interact with computer systems

- Multidisciplinary
- Technology + Design
- Aesthetics
- Creativity
- Qualitative research methods

Human-Computer Interaction in Southampton

COMP2213
Interaction Design

2015/16
2016/17



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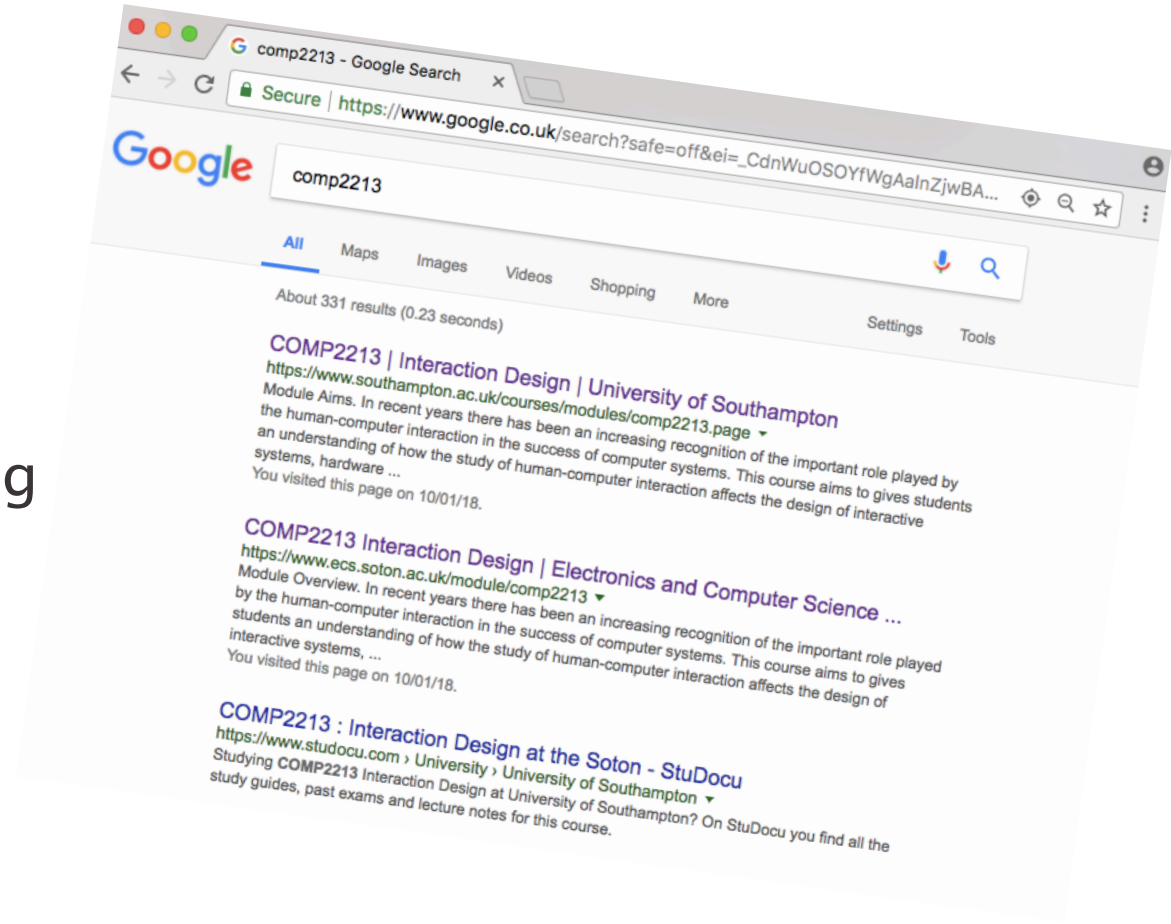
Context of COMP2213

Google it!

- Aims and objectives
- Syllabus
- Teaching and Learning Activities
- Assessment



Context of COMP2213

Google it!

- **Aims and objectives**

Knowledge and Understanding

Having successfully completed this module, you will be able to demonstrate knowledge and understanding of:

- How different disciplines (human factors, cognitive psychology, engineering, graphics design, etc.) influence the design of interactive systems
- How users interact (dialogue) with system
- The classification of input/output devices and techniques
- How to design, prototype and evaluate a user interface

https://www.southampton.ac.uk/courses/modules/comp2213.page#aims_and_objectives

Context of COMP2213

Google it!

- **Aims and objectives**

Subject Specific Intellectual and Research Skills

Having successfully completed this module you will be able to:

- Describe the main concepts (conceptual model, metaphors and paradigms) that influence human-computer interaction
- Explain the main theories of cognition and how these are used when designing interactive systems
- Classify the different input/output devices as to their effect on human-computer interaction
- Describe the process of designing for interaction and why a user centred approach is preferred

https://www.southampton.ac.uk/courses/modules/comp2213.page#aims_and_objectives

Context of COMP2213

Google it!

- **Aims and objectives**

Subject Specific Practical Skills

Having successfully completed this module you will be able to:

- Design a solution interacting with a computer system
- Choose appropriate methods of evaluating an interactive system
- Evaluate a design for interacting with a computer system

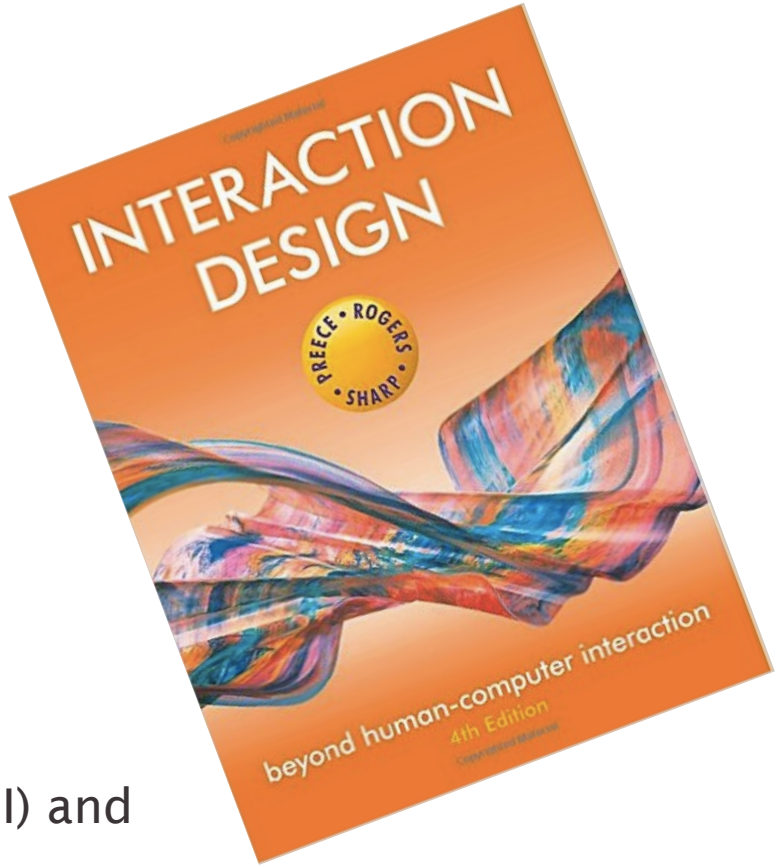
https://www.southampton.ac.uk/courses/modules/comp2213.page#aims_and_objectives

Context of COMP2213

Google it!

- Aims and objectives
- **Syllabus**

- User Psychology
- Hardware (input/output) devices
- Models and Metaphors
- Interaction styles, Graphical User Interface (GUI) and windowing systems
- Design methodology
- Accessibility
- Guidelines, standards and metrics
- Evaluation
- Advanced Interfaces



https://www.southampton.ac.uk/courses/modules/comp2213.page#syllabus

Context of COMP2213

Google it!

- Aims and objectives
- Syllabus
- **Teaching and Learning Activities**

Activity	Description	Hours
Lecture	Lectures are used to present theoretical and practical aspects of developing interactive systems. During the lectures there may be quizzes and discussion with plenary feedback. Participation, while not compulsory, is encouraged.	22
Tutorial	Tutorials will be used to work through examples illustrating the practical application of the techniques discussed in the lectures.	10

NOTE THIS IS DIFFERENT NOW!! https://www.southampton.ac.uk/courses/modules/comp2213.page#learning_and_teaching

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Context of COMP2213

Google it!

- Aims and objectives
- Syllabus
- Teaching and Learning Activities
- **Assessment**

Method	Hours	Percentage contribution
Coursework	-	50%
Exam	2 hours	50%

COMP2213 exam

Google it! (you'll see how it used to be)

Assessment considerations:

- Assessing deep learning *or* memorisation?
- Knowledge *or* skills?
- Group work *or* individual work?

Feedback considerations:

- Formative *or* summative feedback?
- Detailed, personalised, *and* timely feedback?

COMP2213 exam

Google it! (you'll see how it used to be)

- Assessing **deep learning** *or* memorisation?
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- Detailed, personalised, *and* timely **feedback**?

OK but does it scale?

<80 students in 14/15 and before
144 in 15/16
160 in 16/17

COMP2213 exam

Google it! (you'll see how it used to be)

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Enter MCQ-based CAA

COMP2213 exam (revamped)

- Computer Assisted Assessment (with QuestionMark Perception)
- MCQs

Validity?
Reliability?
Integrity?

COMP2213 exam (revamped)

- Computer Assisted Assessment (with QuestionMark Perception)
- Half of the exam are MCQs, the rest, free-text short-answer questions

Hard to set,
hard to answer,
easy to mark

OK but what about constructive alignment?*

Biggs, J and Tang, C. (2011): Teaching for Quality Learning at University, (McGraw-Hill, OUP)

COMP2213 exam (revamped)

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Enter *PeerWise*

Biggs, J and Tang, C. (2011): Teaching for Quality Learning at University, (McGraw-Hill, OUP)

Rising to challenges in assessment and feedback in HCI education: a peer-supported approach

- Students can support each other in the acquisition of knowledge, for formative assessment and feedback provision

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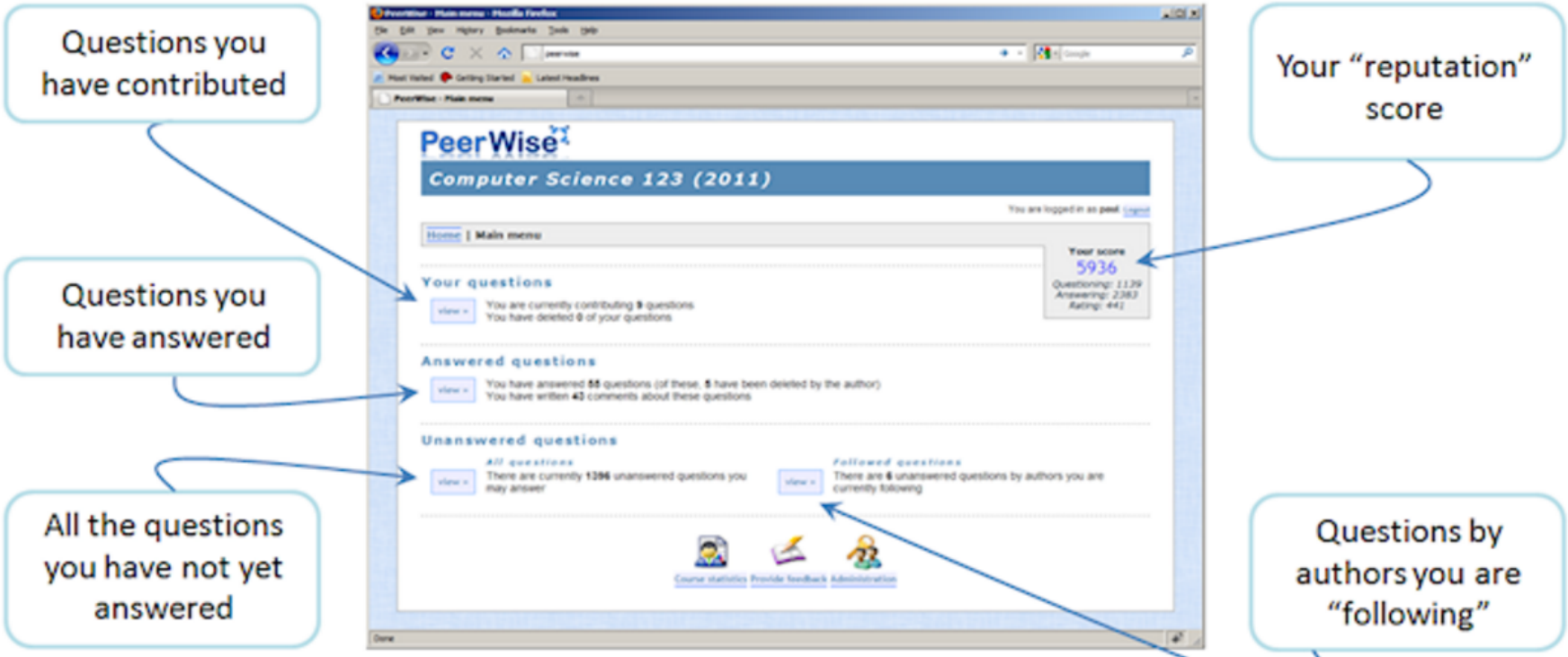
A web-based, peer-learning software that supports authoring, sharing, answering, evaluating and discussing **student-authored multiple-choice questions (MCQ).**

Widely used, but more typically in STEM subjects, which lend themselves naturally to assessment via MCQ.

Students can author questions, as well as answer and rate questions generated by their peers.

Authoring exam-like questions facilitates a deeper learning of course content.

PeerWise



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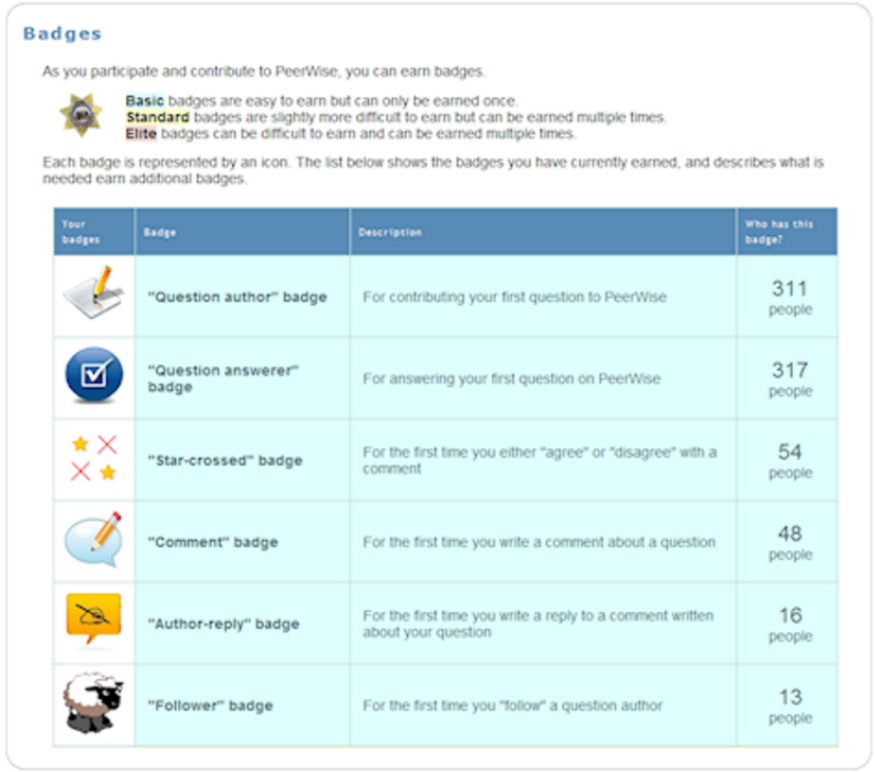
PeerWise



Badges

As you participate and contribute to PeerWise, you can earn badges.

Basic badges are easy to earn but can only be earned once.
Standard badges are slightly more difficult to earn but can be earned multiple times.
Elite badges can be difficult to earn and can be earned multiple times.

Each badge is represented by an icon. The list below shows the badges you have currently earned, and describes what is needed earn additional badges.

Your badges	Badge	Description	Who has this badge?
	"Question author" badge	For contributing your first question to PeerWise	311 people
	"Question answerer" badge	For answering your first question on PeerWise	317 people
	"Star-crossed" badge	For the first time you either "agree" or "disagree" with a comment	54 people
	"Comment" badge	For the first time you write a comment about a question	48 people
	"Author-reply" badge	For the first time you write a reply to a comment written about your question	16 people
	"Follower" badge	For the first time you "follow" a question author	13 people

Students gain badges for reaching different milestones for authoring, answering and commenting on questions.

Lecturers can keep track of students' participation and engagement.

Snow & Wilde (2017) Supporting authoring of Multiple-Choice Questions in Human-Computer Interaction using PeerWise. In *What works in assessment and feedback: Simply better* conference.

Engagement with PeerWise

Thought experiment:

- Give this tool to two cohorts, A & B
- Tell both at the start that **half of the exam** will be MCQs
- For cohort A participation (authoring/answering) is worth 5%
- For cohort B this participation is voluntary: no marks are attached to submitting any questions, or participating, answering, etc

What do you predict?

Engagement with PeerWise

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A (15/16) ☺

B (16/17) ☹

What do you predict?

Engagement with PeerWise (15/16)

- 5% of module mark for participation in PeerWise
- Question quality not marked, but irrelevant or inappropriate questions were removed.
- Questions were required to relate to a chapter of the module textbook.
- Students required to author and answer 4 (different) questions on PeerWise (one of each by 18th March deadline) in order to earn the participation marks.

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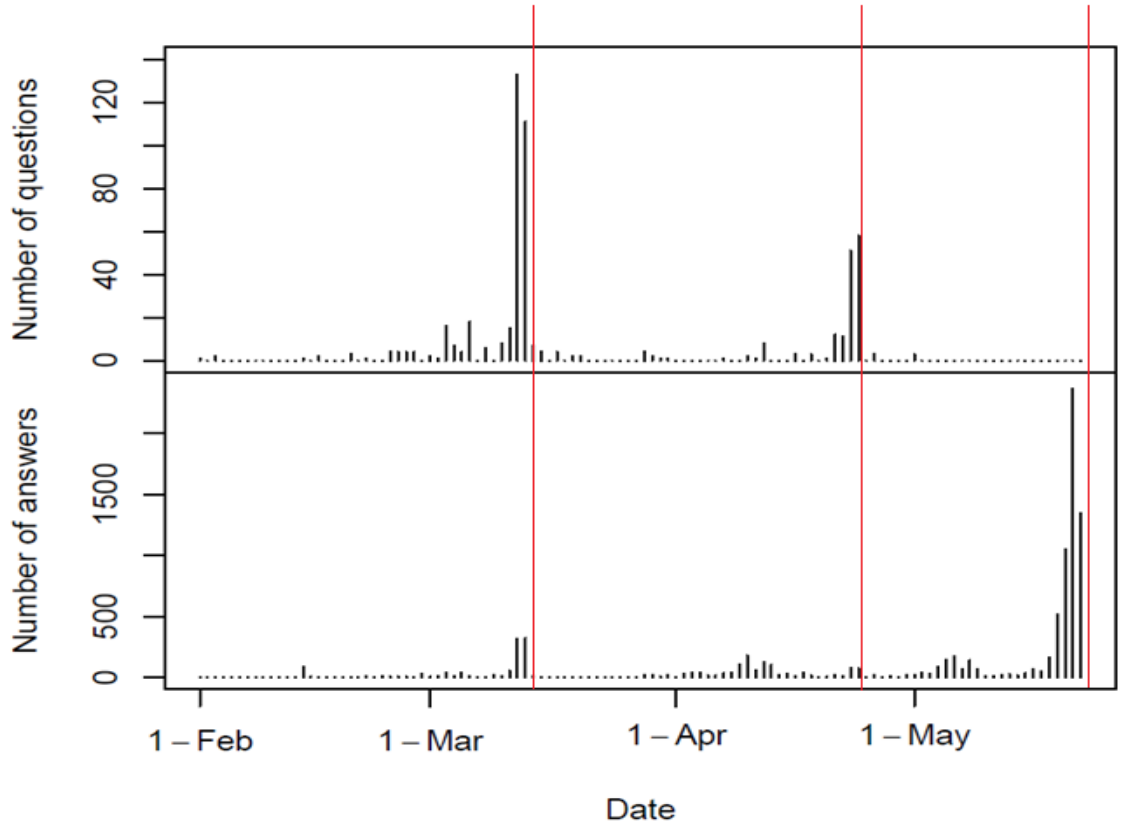
Engagement with PeerWise

	Before 1st deadline	Between deadlines	After deadlines (before exam)
AUTHORED			
Questions authored	358	167	6
Students	113	59	2
Average no. questions authored per student	3.17	2.83	3.00
ANSWERED			
Questions answered	1021	1176	6482
Students	115	59	65
Average no. questions answered per student	8.88	19.93	99.72

Engagement with PeerWise



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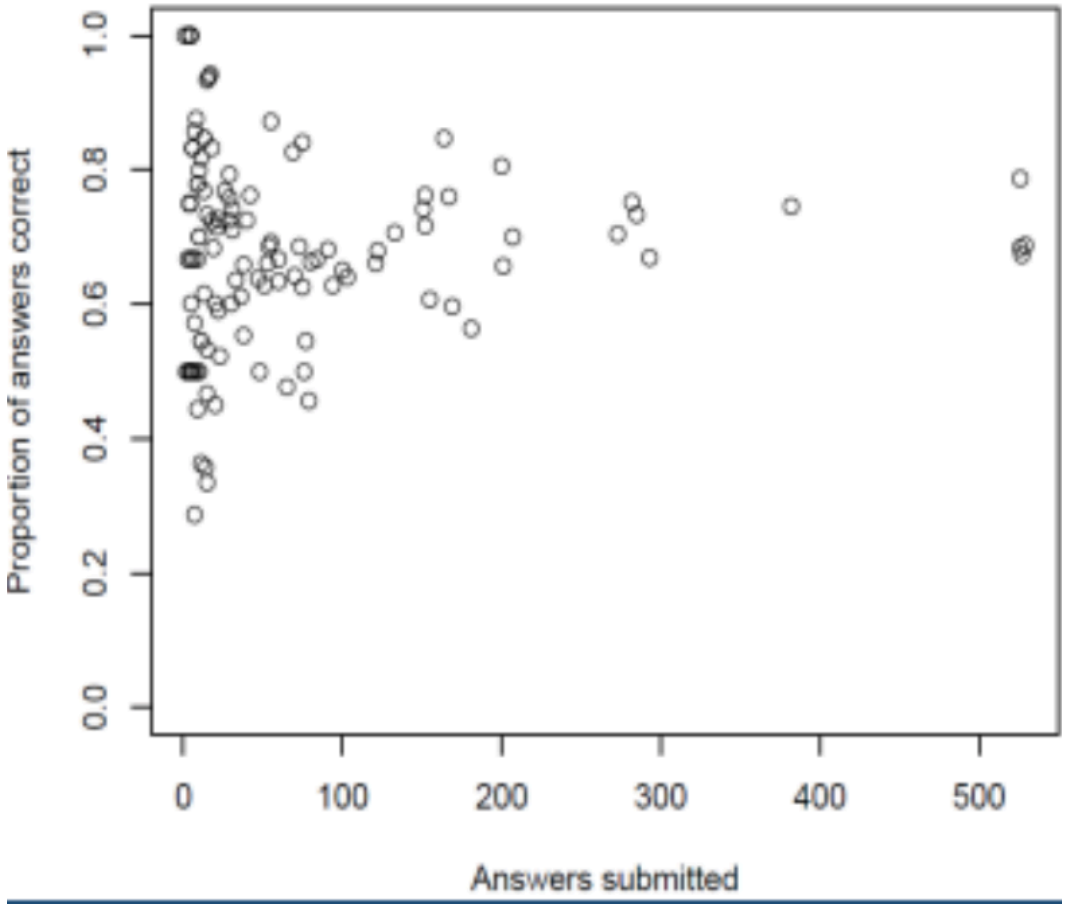
Engagement with PeerWise



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Assessment overview

50% group coursework made up of (1) Report (2) **Video showcasing the group's prototype**

1. Pick topic
2. Choose two qualitative methods (e.g. semi-structured interviews, questionnaires etc)
3. Use qualitative data to inform problem definition and requirements specification
4. Produce a prototype for an IoT device which addresses the problem(s) identified in user research. Must be IoT. No standalone apps.

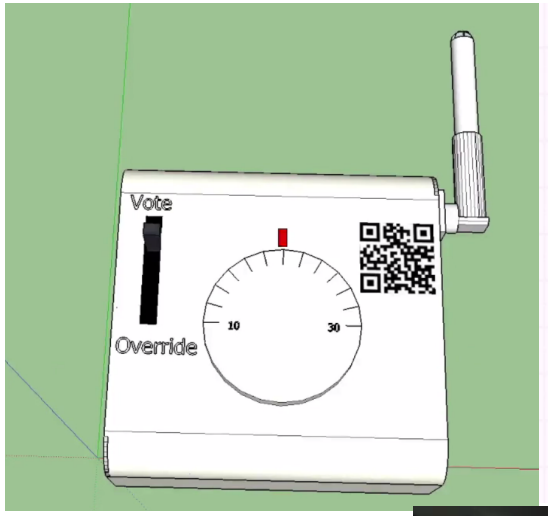
Assessment overview

- **Report:** details context analysis and requirement specification
- **Video:** showcases prototype- functionality, fitness for purpose

- Showed examples of videos from previous year in class
- Used a “Group participation declaration” form- all students must sign and agree on individual participation percentage

Lotus: a timer to improve productivity when studying.


A
Q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Override
10
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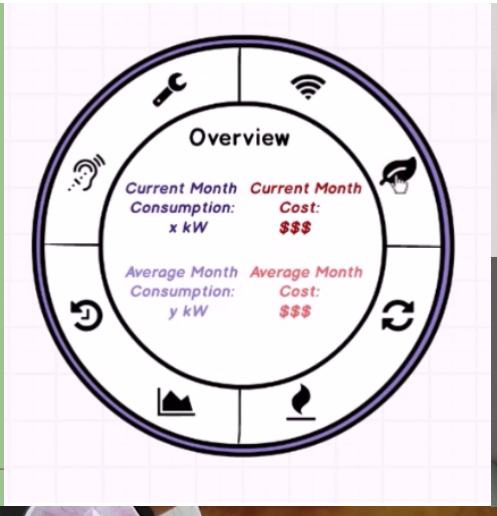
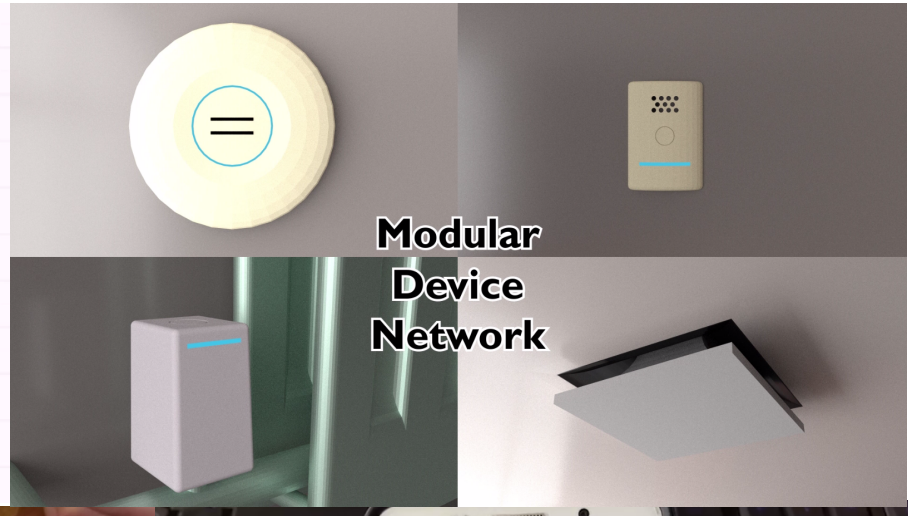
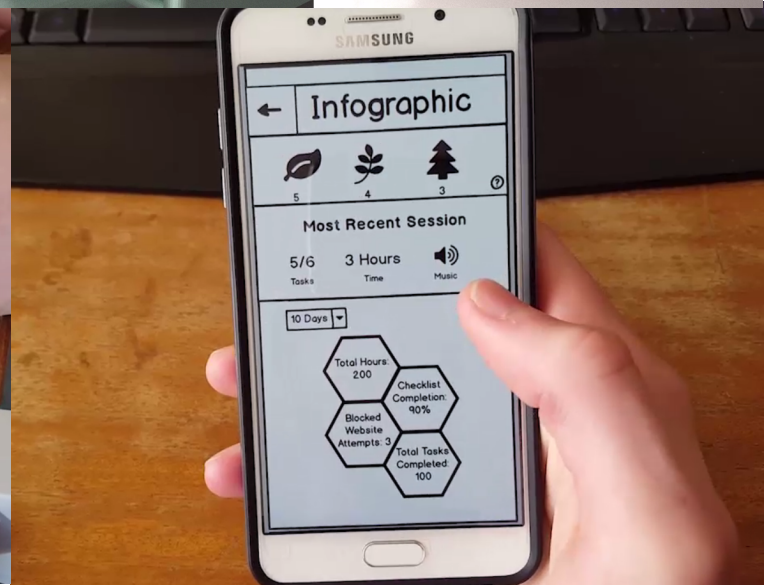
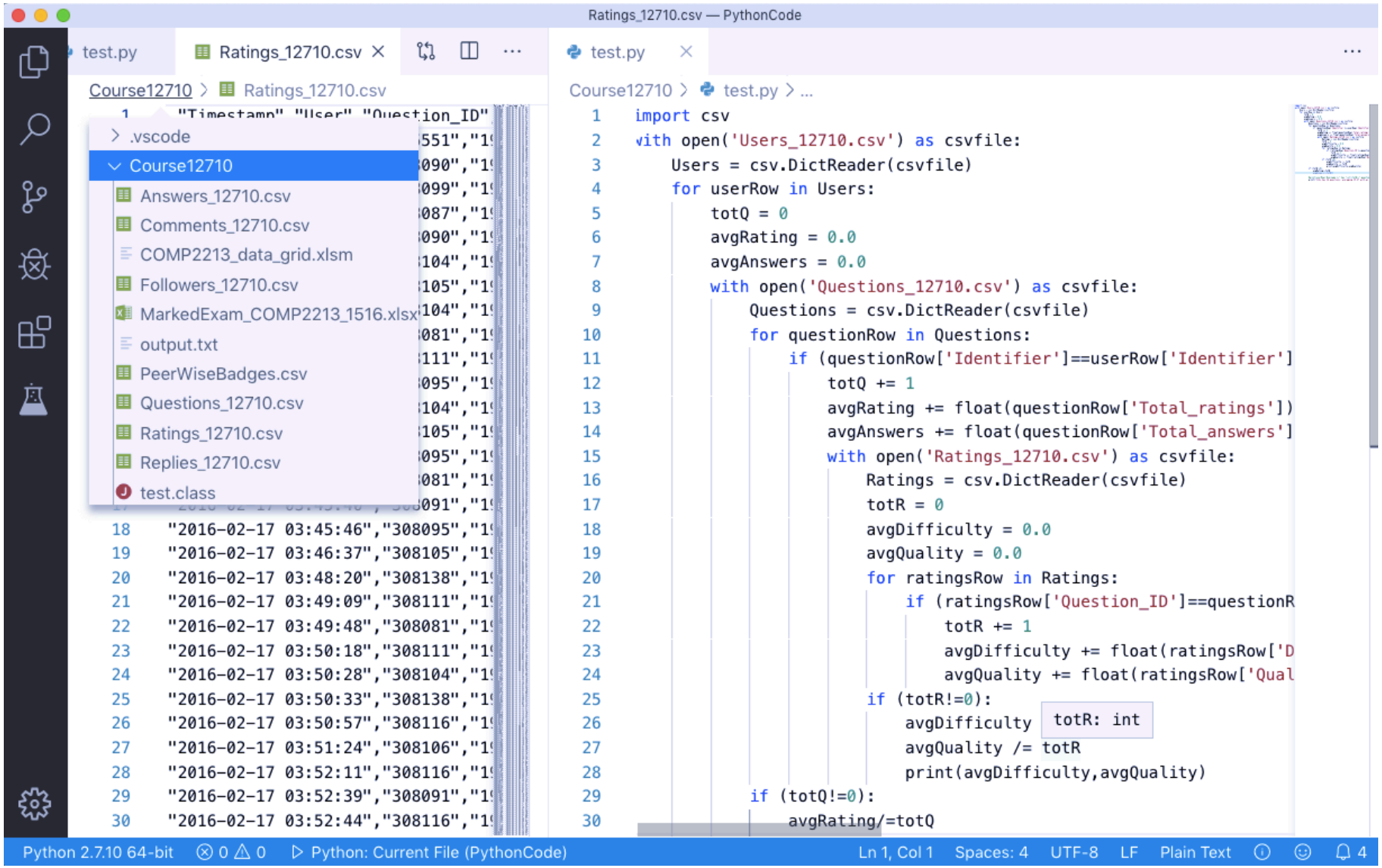

Overview
Current Month Consumption: x kW
Current Month Cost: $$$
Average Month Consumption: y kW
Average Month Cost: $$$


Modular
Device
Network


SAMSUNG
Infographic
Most Recent Session
5/6
Tasks
3 Hours
Time
Music
10 Days
Total Hours: 200
Checklist Completion: 90%
Blocked Website Attempts: 3
Total Tasks Completed: 100

“CURRENT” WORK



Rising to challenges in assessment and feedback in HCI education: a peer-supported approach

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Scalability

Subjective measures

Formative and summative

Timely and personalised

Rising to challenges in assessment and feedback in HCI education: a peer-supported approach

Mediated by technology (e.g. *PeerWise*)

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Video as an assessment method in Human-Computer Interaction
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