CS2D7-15 Visualising data

23/24

Department
Computer Science
Level
Undergraduate Level 2
Module leader
Claire Rocks
Credit value
15
Module duration
5 weeks
Assessment
100% coursework
Study location
University of Warwick main campus, Coventry

Description

Introductory description

You cannot register for this module unless you are enrolled on the BSc Computer Science and Technology Solutions Degree Apprenticeship. It is not possible to request this module as an unusual option. If you are studying at Warwick as a visiting student from overseas it is not possible to register for this module.

This module will allow students to understand the principles and techniques that will allow them to effectively visualise algorithms, data sets, and complex systems.

Module aims

This module aims to build on the basic concepts and issues of working with data and presenting data using appropriate approaches and visualisations

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.

This module includes the following topics:

- Introduction to visualisation
- How visualisations convey information
- Principles and techniques for creating effective visualisations
- Mapping information to images
- Limits of visualisation
- Ethical challenges
- Visualising data sets
- Visualising algorithms
- Coding natural systems

Learning outcomes

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

- Understand and demonstrate the core skills required to visualise information and processes.
- Explore procedures, data, and emergent systems as the subject of visualisations.
- Demonstrate an understanding of visualisations and their usage in a wide range of situations.
- Evaluate visualisations in terms of users and tasks and human factors.
- Assess visualisation needs and apply appropriate techniques to provide effective visualisation.
- Critically appraise visualisation approaches.
- Understand and be able to select and apply an appropriate range of visualisation and reporting techniques to data sets relevant to their workplace.

Indicative reading list

Reas, C., and Fry, B., "Processing: A Programming Handbook for Visual Designers (2/e)", MIT Press (2014)
Schiffman, D., "The Nature of Code: Simulating Natural Systems with Processing" (2012)
Tufte, ER, "The visual display of Quantative information" (2001)
Sedgewick, R., and Wayne, K., "Algorithms (2/e)" (2011)

Subject specific skills

- Analyse business and technical requirements to select and specify analyses business and technical requirements to select and specify appropriate technology solutions
- Identify organisational information requirements and model data solutions using conceptual data modelling techniques
- Able to manage data effectively and undertake data analysis
- Import, cleanse, transform, and validate data with the purpose of understanding or making conclusions from the data for business decision making purposes
- Present data visualisation using charts, graphs, tables, and more sophisticated visualisation tools
- Perform routine statistical analyses and ad-hoc queries
- Report on conclusions gained from analysing data using a range of statistical software tools

- Summarise and present results to a range of stakeholders making recommendations
- The quality issues that can arise with data and how to avoid and/or resolve these
- How to use and apply industry standard tools and methods for data analysis
- The organisation's data architecture

Transferable skills

- Fluent in written communications and able to articulate complex issues
- Makes concise, engaging and well-structured verbal presentations, arguments and explanations.
- Applies analytical and critical thinking skills to Technology Solutions development and to systematically analyse and apply structured problem solving techniques to complex systems and situations
- Have demonstrated that they have mastered basic business disciplines, ethics and courtesies, demonstrating timeliness and focus when faced with distractions and the ability to complete tasks to a deadline with high quality.
- Flexible attitude
- Ability to perform under pressure
- A thorough approach to work

Study

Study time

Type	Required
Lectures	15 sessions of 1 hour (10%)
Tutorials	14 sessions of 1 hour (9%)
Practical classes	9 sessions of 2 hours 30 minutes (15%)
Work-based learning	197 sessions of 30 minutes (65%)
Total	150 hours

Private study description

No private study requirements defined for this module.

Costs

No further costs have been identified for this module.

Assessment

You do not need to pass all assessment components to pass the module.

Assessment group A1

	Weighting	Study time	Eligible for self-certification
Assessment component			
Initial brief	20%		No
Reassessment component is the same			
Assessment component			
Visualisation	50%		No
Reassessment component is the same			
Assessment component			
Documentation	30%		No
Reassessment component is the same			

Feedback on assessment

Written and verbal

Availability

Courses

This module is Core for:

- BSc Computer Science and Technology Solutions (Data Analyst)