

| Module Details | |
|----------------|------------------------------------------------|
| Module Title | Big Data Visualisation (PG) |
| Module Code | COS7046-B |
| Academic Year | 2024/5 |
| Credits | 20 |
| School | School of Computer Science, AI and Electronics |
| FHEQ Level | FHEQ Level 7 |

| Contact Hours | |
|----------------|-------|
| Type | Hours |
| Laboratories | 22 |
| Lectures | 24 |
| Directed Study | 154 |
| Directed Study | 154 |

| Availability | |
|--------------|-------------------------------------|
| Occurrence | Location / Period |
| BDA | University of Bradford / Semester 1 |
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| Module Aims |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>The aim of this module to provide you with key principles and techniques of data visualisation.</p> <p>By completing this module you will gain advanced knowledge and skills on developing methods and techniques of data visualisation to improve comprehension, communication, and decision making in big data applications.</p> |

Outline Syllabus

Module organisation of work and topics

The outline syllabus gives you an indication of which topics you will study. This information may be subject to change, so please keep a record of any module announcements regarding changes from your Module Tutor, from Canvas, or by electronic communication.

- (1) Visualization techniques and user requirements.
- (2) Analysis techniques to critique examples of visualizations.
- (3) Interpretation of multidimensional, big and complex data formats.
- (4) Application of data visualisation to real-life problems.
- (5) Knowledge extraction from big data using data visualizations
- (6) Dimensionality reduction techniques in Big Data and applications

Learning Outcomes

| Outcome Number | Description |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 01 | Demonstrate an advanced understanding of modern data visualisation methods and systems. |
| 02 | Demonstrate a practical and advanced ability in the implementation of data visualisation techniques in practical situations. |
| 03 | Deploy enhanced technical analysis and problem-solving skills, advanced written and presentation skills. |
| 04 | Design and implement suitable architectures for organising and visualising big data. b) Discuss contemporary issues in big data project management including intellectual property, legal and ethical aspects. c) Apply skills and techniques for problem solving in big data visualisation |
| 05 | Work on real-life problems by designing, implementing, and evaluating intelligent software solutions and applications. |

Learning, Teaching and Assessment Strategy

The course will consist of lectures, computer lab sessions, independent study, and directed reading to provide the opportunity to gain theoretical knowledge and practical knowledge of Big Data Visualisation. Formal lectures will outline the theoretical principles of Big Data Visualisation. Lab sessions will provide students with the necessary software skills to develop their own Big Data Visualisation systems. The coursework will involve students in the practical development of Big Data Visualisation models on real-life data sets and problems. Students will be assessed through two courseworks

Utilising recent developments and current research in Big Data Visualisation, the students will participate in lectures, workshops, lab sessions and independent study to explore advanced concepts and solve real-world problems. This module will use recent developments, case studies, practical demonstrations, and significant opportunities for students to design their own solutions.

To support accessibility, clarity and comprehension all teaching material is provided online wherever possible in advance of the teaching sessions. Throughout the programme, lots of opportunities are provided for students to design their own solutions and to express their own ideas, choosing from a variety of Big Data Visualisation frameworks, tools, and services.

To prepare the students for employment in the real-world, assessments are designed to measure industry needed skills such as data processing, multidisciplinary skills, software development, report writing skills and team-work skills (using group coursework to strengthened students? ability to work effectively in teams). Throughout the module, students will be provided with variety of practical problems, which will help develop confidence in tackling data analysis problems and in the use of the software tools that will support them. The timely constructive feedback during practical lab exercises and online support using TEL tools will support student learning throughout the module.

Assessment is in the form of two coursework exercise that require students to select and solve problems in the fields of Big Data Visualisation using both the knowledge gained in the module as well as independent research conducted during the completion of the coursework. Communication of research outcomes and key findings are tested in written report and software codes.

It is a requirement of the Institution of Engineering and Technology (IET) that students MUST achieve a mark of at least 30% in assessment components weighted above 30% IN ADDITION to achieving a mark of at least 40% in the module overall. This requirement applies ONLY to students on IET accredited programmes, which is the BDA occurrence/version of the module.

Mode of Assessment

| Type | Method | Description | Weighting |
|-----------|----------------------|--------------------------------------------------------------------------------|-----------|
| Summative | Coursework - Written | Exercises on the development of visualisation solution to a real-life problem. | 50% |
| Summative | Coursework - Written | Exercises on the development and creation of big data visualisation system. | 50% |

Reading List

To access the reading list for this module, please visit <https://bradford.rl.talis.com/index.html>

Please note:

This module descriptor has been published in advance of the academic year to which it applies. Every effort has been made to ensure that the information is accurate at the time of publication, but minor changes may occur given the interval between publishing and commencement of teaching. Upon commencement of the module, students will receive a handbook with further detail about the module and any changes will be discussed and/or communicated at this point.

