UNIVERSITY of BRADFORD

Module Descriptor

Module Details	
Module Title	Discipline-specific Artificial Intelligence Project
Module Code	GAV5028-E
Academic Year	2022/3
Credits	60
School	Department of Media Design and Technology
FHEQ Level	FHEQ Level 5

Contact Hours	
Type	Hours
Laboratories	4
Lectures	30
Practical Classes or Workshops	2
Project Supervision	50
Seminars	66
Supervised time in studio/workshop	6
Directed Study	442

Availability	
Occurrence	Location / Period
BDA	University of Bradford / Academic Year

Module Aims

Identify a current discipline-specific problem to develop a project plan and prototype for an AI solution.

Identify, source and process a discipline-specific dataset to solve the chosen problem.

Use appropriate machine learning techniques and tools to arrive at a solution.

The project work will build upon the knowledge and skills developed in the technical modules (e.g. AI Methods and Tools, Machine Learning Methods and Models and Data Science for AI) as well as in the Project Design and Development module from year 1. The project will also draw upon topics/issues discussed in Principles of Responsible Management and Practice, Multidisciplinary Issues and Innovations and Safe AI: Ethics, Law and Governance.

Outline Syllabus
* In the first semester, an introduction of project planning and related activities will be provided in the lectures/seminars. The activities will include defining the project scope, project schedule, resource requirement, project cost estimation, project quality and project risk management. * Identifying a discipline-specific problem with the help of Multidisciplinary Issues and Innovations module. Detailed discussions will be undertaken to critically evaluate the selection of a particular discipline for developing the AI solution, considering its pros and cons in terms of data availability, domain knowledge, and the level of difficulty involved in the developing the AI solution of the selected problem. * In semester 2, we will address the activities related to designing a solution, implementation and testing, critical analysis of the results- including reflective work on applicable professional, legal, ethical and environmental issues in the concerned industry, privacy, data protection, and human-computer interaction. * We will explore different AI technologies, both open-access and licensed tools, and identify the appropriate tool for the development of the project. Example classes of technologies that we discuss are, but not limited to, TensorFlow, Keras, Caffe, Amazon AI Services and Microsoft Azure AI.

Learning Outcomes	
Outcome Number	Description
LO1	Demonstrate how artificial intelligence can be used to support the development of intelligent computer systems.
LO2	Apply and evaluate appropriate AI technologies for the development of an AI solution to a discipline-specific problem.
LO3	Assess the implications and possibilities of subject-specific AI in the target discipline.

Learning, Teaching and Assessment Strategy

The delivery of this module consists of supervised time in labs, project supervision, seminars, and lectures and brings together and builds on the theoretical knowledge, practical skills and consideration of topics/issues developed in the other core level 4 and level 5 modules of the programme.

Building on the skills developed in the level 4 Project Design and Development module, students are expected, in this module, to take on a greater level of independence in defining a problem and sourcing appropriate datasets, and a greater level of sophistication in developing a solution using appropriate AI tools/project management techniques and in evaluating the effectiveness of such approaches.

For each project, students will be provided with a brief from which they will work with subject specialists, in small groups to identify a problem, design and develop an AI solution and evaluate its effectiveness. Each team will undertake one discrete challenge. This challenge/project, either posed by the host faculty or identified by the students (with the guidance of domain experts), may focus on applications of one or multiple disciplines.

Students will be supported by two supervisors at each stage of the project ? one with expertise in the broad discipline area of the chosen project and the other from the AI programme team.

Supervision sessions will be used to facilitate discussion of the effectiveness of each group?s solution and each stage of the project development. All teams will be required to reflect and evaluate projects at key milestones (conception, design, implementation/testing) and will be encouraged to provide, receive and reflect on peer-to-peer feedback to inform their final critical reflection.

Broader knowledge of the sector and ethical and governance issues will form part of other taught integrated modules (e.g. Multidisciplinary Issues and Innovations and Safe AI: Ethics, Law and Governance), but all other skill needs identified by project teams will be facilitated by the project supervisors.

Informal lectures and seminar sessions, project planning/management and related activities will be covered, including defining project scope, project schedule, resource requirements, project cost estimations, project quality and project risk management. These sessions will inform the development of the formative project plan assignment in the first semester of the module.

In the laboratory/workshop sessions students will be developing and testing their prototype demos. In these sessions they will also be showcasing their project prototype as it is progressing and receiving feedback from the tutors and peers that will help them improve the quality of the final prototype demo.
The summative assessment for this module revolves around the execution of a group AI project. Students will work in groups, using topics/issues discussed in the Multidisciplinary Issues and Innovations module, to identify a domain-specific problem, source and process relevant datasets and develop and present a prototype AI solution, using appropriate AI tools and project management techniques.

The first piece of assessment takes the form of a live demo of each group?s AI solution and contributes 40% to the module mark. Students will receive a group mark for the demo assessment. However, student contribution to the group assignment will be monitored and marks for individual students may be adjusted for non-engagement. This will be a face-to-face presentation with a maximum duration of 15 minutes. The key assessment criteria are:
* The quality and relevance of the problem addressed and the and AI solution obtained.
* The level at which the project objectives have been met.
* The ability to communicate project outcomes to peers and professionals
* Peer feedback throughout the project
* The level of teamwork and team cohesiveness.

The second piece of the assessment accounts for 60% of the module mark and takes the form of an individual critical reflective piece, in which students will be expected to reflect on the problem addressed, the solution arrived at, individual contribution and group dynamics.

The key assessment criteria are:
* Background to the problem and its applicability in the real world
* Project plan/business case
* Sourcing and processing of data
* Choice of AI methods and techniques
* Critical evaluation of the solution proposed
* Critical evaluation of project execution, group work and individual contribution
* Peer feedback throughout the project

Students will complete formative tasks throughout the module and will receive feedback during seminar sessions and project supervision sessions. The main piece of formative work will be the development of a group project plan/business case following the identification of an industrially relevant AI project. This will be completed during the first semester of the module and feedback from this process will inform students on the development of the assessment in the second semester. Opportunities will be available to give and receive peer feedback during the seminar and supervisory sessions. Students are expected to reflect on this feedback in their critical reflection piece.
Supplementary assessments will be as original except in instances where an individual student is required to re-sit the group demo assignment. In this scenario, the individual student will be asked to present a brief summary/demo of the proposed group solution appropriate to the expected individual contribution in the original group assignment.

Mode of Assessment			
Type	Method	Description	Weighting
Summative	Presentation	Group demonstration (15mins) of AI prototype solving given problem. SUPPLEMENTARY: Group demo or individual contribution	40%
Summative	Coursework - Written	Individual critical analysis with reflective component (4000 words) of group project working and outcomes	60%
Formative	Coursework - Written	Formatively assessed business case (750 words) as part of group project plan development	N/A

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.

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