COMP3771/XJCO User Adaptive Intelligent Systems

Coursework (30% of module)

Deadline for submission: 10am (UK time), Thursday 17 November 2022

Submit a pdf file in Gradescope following the link in MINERVA

Learning objectives

- to derive requirements for a user-adaptive system in a specific context;
- to design and prototype a user-adaptive system using recommender techniques;
- to broaden your knowledge of recommender systems by researching relevant literature;
- to assess the strengths and weaknesses of your proposal;
- to practise technical report writing.

Task

Design a prototype of a ***student personal sustainability assistant*** which helps students to have a sustainable lifestyle by offering relevant and timely suggestions/advice adapted to the individual student's interests, motivation and habits.

Write a report presenting your design. The report should be **maximum 1500 words and no more than 6 pages** (excluding references).

Specification

Your application should focus on one aspect of sustainable living. Possible sustainable living aspects include (but are not limited to): travel, food, recycling, shopping, volunteering, etc. You should justify the selection of the sustainability aspect with references to guides on how to be a sustainable student and should describe why personalisation is important for the specific aspect you have selected.

Your report should be written in an academic style, and should include the following sections:

1. An **introduction** which:
    - justifies the selected sustainability aspect (use appropriate references to justify why you have selected the sustainability aspect and why personalisation is needed);
    - outlines the requirements for your personal sustainability assistant (describe how you derived the requirements and list the requirements).

2. An **overall prototype architecture**, following the general schema of user-adaptive systems introduced in lectures. The graphical representations should be supported by brief explanation of each component describing its input and output.

3. An **outline of the recommender method** that will be used, including:
    - justification of the selection of the recommender method using appropriate references to user-adaptive systems that use this recommender method (not necessarily in a sustainability context);
    - description of the recommender method, including the background data, the input data, and how this data will be used to produce recommendations.

4. A **critical review** of the proposed prototype, discussing two strengths and two limitations. You should include both a computational perspective and a human-factors perspective when describing the strengths and limitations.

5. A **link to a video (3 minutes long) presenting your prototype** of a personal sustainability assistant. The demo should be based on a user scenario that illustrates the user interaction with the systems. The demo should show what data is collected about the user and what information is provided to the user. The demo will mock the input data and the interface. You are free to use any software to develop your prototype. Low fidelity, e.g. storyboarding with PowerPoint or wireframes (e.g. balsamiq) will suffice for the task. If you prefer to use any high fidelity prototyping, this will be fine too. The report should provide an online link to the video and a description how to access it.

Resources

- Re-read articles issued in the module as you may find helpful ideas from these experts on the overall architecture, the design of the user model, and the user modelling methods to be used.
- Visit User Modeling Inc (https://www.um.org/) and Recommender Systems conferences (https://recsys.acm.org/) for examples of user-adaptive systems presented at past conferences. Reference the systems that inspire the personalisation features to include in your application. Your inspiration may come from another domain and can be adapted for the problem in this coursework.
- You should include references that come from scholarly outputs in adaptation and personalisation; for instance, the RecSys (Recommender Systems) or UMAP (User Modelling, Adaptation and Personalisation) conference series, the UMUAI (User Modeling and User-adapted Interaction) journal.

Marking scheme:

Introduction	12 marks
Prototype architecture	18 marks
Outline of the recommender method	15 marks
Critical review	12 marks
Video presenting the prototype	18 marks
Write up (report structure, clarity, presentation, referencing)	5 marks
Total	**80 marks**

Detailed marking scheme

Section	Feedback	Marks available
Introduction	- Selected sustainability aspect properly justified (3 marks); - Justification uses appropriate references (3 marks) - Appropriate method to derive requirements is used (3 marks) - Description of requirements (3 marks)	12
Prototype architecture	- Architectural diagram appropriate (3 marks) - User data collection properly described with clear indication of what implicit and explicit methods are used (3 marks) - User model representation properly described, diagrams and illustrations are used appropriately (3 marks) - User modelling method properly described (3 marks) - User model application properly described (3 marks) - User-adaptive interface properly described (3 marks)	18
Outline of the recommender method	- The selection of the recommender method properly justified (3 marks) - The justification uses appropriate references to user-adaptive systems that use this recommender method (3 marks) - Background data properly described (3 marks) - Input data properly described (3 marks) - Appropriate description how background and input data will be used to produce recommendations (3 marks)	15
Critical review	- Strength 1 (2 marks) - Strength 2 (2 marks) - Strengths include clearly specified computational aspect and a human factors aspect (2 marks) - Limitation 1 (2 marks) - Limitation 2 (2 marks) - Limitations include clearly specified computational aspect and a human factors aspect (2 marks)	12
Video presenting the prototype	- User scenario appropriate (3 marks) - The prototype demo shows clearly what data is collected about the user (3 marks) - The prototype demo shows clearly what information is shown to the user (3 marks) - The prototype demo shows clearly how the system adapts to the user (3 marks) - The prototype meets the requirements specified in the introduction (6 marks)	18
Write up	- Appropriate report structure (1 mark) - Appropriate formatting (1 mark) - Clear and grammatically correct language (1 mark) - Appropriate illustrations (1 mark) - Appropriate referencing (1 mark)	5
TOTAL		80