

# F21HR COURSEWORK A

For this coursework, you will work in a group to implement a human-robot interaction task on the small Cozmo robot as a proof of concept which could be used in a larger robot task.

This is a group assignment. You should work in groups of two or three. It will not be possible to work in a larger group.

The choice of scenario is deliberately open-ended, as at this level of academic expertise you are expected to provide some level of creativity in your work. However, the scenario theme should be within the broad context of how robotics can provide social, physical or mental benefits to humans.

An example task for the system would be to assist a user in choosing an outfit to wear that is weather appropriate, and then fetch it, should the user request it. For this example, Cozmo could initially generate a welcome message, then inform the user of the weather outside which it should obtain in real-time from an external API. Using the three cubes, each of which representing an item of clothing, Cozmo would then suggest a weather appropriate outfit. Finally, Cozmo could then aid the user in collecting the required outfit (in this example represented by a specific cube), and then collect it.

We encourage you to design and implement a new task scenario, however, you are free to use or adapt the example given if you wish. Nevertheless, the interactive behaviour must be of an appropriate level of complexity that an experimental evaluation of it would allow an interesting investigation of an HRI topic.

**Your implementation of the task scenario on the Cozmo robot platform must meet the following criteria:**

1. Be developed using the Cozmo app on iOS or Android and/or the Cozmo SDK for Windows, MacOS, or Linux.

You are free to use the Cozmo app to create the interaction behaviours. However, you must at minimum implement one functionality using the Cozmo SDK, this may be communication with the API discussed in 2.

2. Demonstrate the use of at minimum one external API **or** use of a machine learning library (e.g. facial recognition) to aid the task scenario.

This group assignment is worth 54% overall of your final mark. It is made up of multiple deliverables and an in-class demonstration (see Deliverable for dates). Your source code and report must be submitted on Canvas.

## DELIVERABLE

Your assignment includes the following deliverables (please note their due dates):

- Project proposal, due Thursday October 6th at 3:00pm
- Source code (part of demo mark), due Friday November 11th at 3:00pm
- Demonstration, due Thursday 10<sup>th</sup> November at 9:00am – 12:00pm
- Report, due Friday November 11th at 3:00pm

**Project proposal:** Each group should submit a brief proposal explaining their idea for the group project. Proposals should be 1 - 3 paragraphs long and no longer than 1 page (excluding references). The project proposal should outline at least two papers from an HRI journal or conference (list will be provided) that were most influential to your project proposal, 5 marks.

**Source code:** The source code that will be used for the demonstration must be submitted as a zipped file prior to the demonstration date. Please submit your sources in a single zipped file. Do not include any external libraries or SDK files in your submission (only your original work).

Please add comment blocks / lines in your code. Failure to submit source code will result in a zero mark for the demonstration.

**Demonstration:** Demonstrations will happen in class during Week 9. Each group will have 10 minutes to present. The demonstration will include a short oral examination during which the instructors will ask questions about your design and implementation. We recommend that you plan for 5 minutes of demonstrating your implementation and allow for up to 5 minutes for questions.

**Report:** The final report is due in Week 9 and should be made up of the following sections (**plus the Abstract (5%), Introduction(5%), and Conclusion(5%)**):

- **Related work (30%):** Cite papers that relate to your designed behaviour and/or its intended application area.
- **Design and implementation (45%):** Explain the rationale behind your design and critical aspects of your implementation.

- **Critical reflection on demonstration (5%):** This is an opportunity to address any issues that were raised during your demonstration. If something didn't work well, how would you address it in future work? If there were issues that you hadn't considered that were brought up during the demonstration, you can discuss them in this section.

**Coursework Deadline: 11<sup>th</sup> November 1500 hours**

## **FURTHER INFORMATION**

Plagiarism will not be tolerated and will incur serious penalties. You can find the university's plagiarism policy at <https://www.hw.ac.uk/uk/students/studies/examinations/plagiarism.htm>.

The standard university late submission policy applies. Assignments submitted up to 5 working days late will be penalised by 30% off the achieved mark. Assignments submitted over 5 working days late will not be marked (this includes formative feedback).