Plan Overview

A Data Management Plan created using DMPonline

Title: Embodied Intelligence for Adaptive Human Robot Collaboration in Dynamic Construction Environments

Creator: Yifan Xu

Principal Investigator: Clara Cheung

Data Manager: Yifan Xu

Affiliation: University of Manchester

Template: University of Manchester Generic Template

Project abstract:

This project, *Embodied Intelligence for Adaptive Human Robot Collaboration in Dynamic Construction Environments*, develops a novel simulation framework that integrates embodied intelligent agents into HRC modelling. The research addresses key challenges in construction, including labour shortages, safety risks, and low levels of automation, by enabling robots to adapt dynamically to human behaviour and changing site conditions. The project will generate and manage multiple types of research data, including simulation models, agent architectures, scenario definitions, and performance evaluation datasets. These data will be produced through the development of embodied intelligent agents, their integration into a BIM-based construction simulation platform, and scenario-based experiments evaluating safety, efficiency, and adaptability of HRC systems.

ID: 200228

Last modified: 17-03-2026

Embodied Intelligence for Adaptive Human Robot Collaboration in Dynamic Construction Environments

Manchester Data Management Outline

1. Will this project be reviewed by any of the following bodies (please select all that apply)?

- Funder

2. Is The University of Manchester collaborating with other institutions on this project?

- Yes - Part of a collaboration and owning or handling data

3. What data will you use in this project (please select all that apply)?

- Generate textual supporting information only
- Re-use existing data (please list below)
- Acquire new data

4. Where will the data be stored and backed-up during the project lifetime?

- University of Manchester Research Data Storage Service (Isilon)

Figshare or github

5. If you will be using Research Data Storage, how much storage will you require?

- < 1 TB

6. Are you going to be receiving data from, or sharing data with an external third party?

- No

7. How long do you intend to keep your data for after the end of your project (in years)?

- 5 - 10 years

Guidance for questions 8 to 13

Highly restricted information defined in the Information security classification, ownership and secure information handling SOP is information that requires enhanced security as unauthorised disclosure could cause significant harm to individuals or to the University and its ambitions in respect of its purpose, vision and values. This could be: information that is subject to export controls; valuable intellectual property; security sensitive material or research in key industrial fields at particular risk of being targeted by foreign states. See more examples of highly restricted information .

If you are using 'Very Sensitive' information as defined by the Information Security Classification, Ownerships and Secure Information Handling SOP, please consult the Information Governance Office for guidance.

Personal information, also known as personal data, relates to identifiable living individuals. Personal data is classed as special category personal data if it includes any of the following types of information about an identifiable living individual: racial or ethnic origin; political opinions; religious or similar philosophical beliefs; trade union membership; genetic data; biometric data; health data; sexual life; sexual orientation.

Please note that in line with data protection law (the UK General Data Protection Regulation and Data Protection Act 2018), personal information should only be stored in an identifiable form for as long as is necessary for the project; it should be pseudonymised (partially de-identified) and/or anonymised (completely de—identified) as soon as practically possible. You must obtain the appropriate ethical approval in order to use identifiable personal data.

8. What type of information will you be processing (please select all that apply)?

- No confidential or personal data

9. How do you plan to store, protect and ensure confidentiality of any highly restricted data or personal data (please select all that apply)?

- Not applicable

10. If you are storing personal information (including contact details) will you need to keep it beyond the end of the project?

- Not applicable

11. Will the participants' information (personal and/or sensitive) be shared with or accessed by anyone outside of the University of Manchester?

- Not applicable

12. If you will be sharing personal information outside of the University of Manchester will the individual or organisation you are sharing with be outside the EEA?

- Not applicable

13. Are you planning to use the personal information for future purposes such as research?

- No

14. Will this project use innovative technologies to collect or process data?

- Yes, and innovative technologies will not collect or process personal data (please list the innovative technologies below)

15. Who will act as the data custodian for this study, and so be responsible for the information involved?

yifan xu

16. Please provide the date on which this plan was last reviewed (dd/mm/yyyy).

2027-12-31

Project details

What is the purpose of your research project?

The purpose of this research project is to develop a novel simulation framework for human robot collaboration (HRC) in construction by integrating embodied intelligence into robotic agents. This enables robots to perceive, decide, and act adaptively in response to human behaviour and dynamic site conditions, overcoming the limitations of traditional rule based models. Ultimately, the project

aims to improve the safety, efficiency, and coordination of HRC in construction environments, while providing a modelling framework that supports the effective and safe deployment of robotics in real-world construction scenarios

What policies and guidelines on data management, data sharing, and data security are relevant to your research project?

This project will follow the data management policies of the University of Manchester and align with UKRI (UK Research and Innovation) guidelines, ensuring data are managed according to FAIR principles (Findable, Accessible, Interoperable, Reusable). Data security and handling will comply with the UK General Data Protection Regulation (UK GDPR) and the Data Protection Act 2018, although no personal or sensitive data are expected. All research data, models, and code will be securely stored, well-documented, and shared where appropriate to support transparency and reproducibility.

Responsibilities and Resources

Who will be responsible for data management?

Question not answered.

What resources will you require to deliver your plan?

Question not answered.

Data Collection

What data will you collect or create?

Question not answered.

How will the data be collected or created?

Question not answered.

Documentation and Metadata

What documentation and metadata will accompany the data?

Question not answered.

Ethics and Legal Compliance

How will you manage any ethical issues?

Question not answered.

How will you manage copyright and Intellectual Property Rights (IPR) issues?

Question not answered.

Storage and backup

How will the data be stored and backed up?

Question not answered.

How will you manage access and security?

Question not answered.

Selection and Preservation

Which data should be retained, shared, and/or preserved?

Question not answered.

What is the long-term preservation plan for the dataset?

Question not answered.

Data Sharing

How will you share the data?

Question not answered.

Are any restrictions on data sharing required?

Question not answered.