

# Section A - Study Background

\* Required

1. What stage of engineering are you in?

*Mark only one oval.*

- ☐ a. Part I
- ☐ b. Part II
- ☐ c. Part III
- ☐ d. Part IV
- ☐ e. Finished
- ☐ f. N/A

2. If you study engineering, which specialisation are you?

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3. 4. What is your previous experience with Augmented Reality?

*Mark only one oval.*

- ☐ a. No experience
- ☐ b. Minimal experience
- ☐ c. Moderate experience
- ☐ d. Substantial experience

4. What is your previous experience with the Architecture, Engineering and Construction industries?

*Mark only one oval.*

- ☐ a. No experience
- ☐ b. Minimal experience
- ☐ c. Moderate experience
- ☐ d. Substantial experience

5. If you have experience with either, please briefly explain it below:

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## Section B - Experiment Questions

6. Paper or AR First

*Check all that apply.*

- ☐ Paper
- ☐ AR

### Task 1

You are tasked with checking the design of a room within the building model. The room must conform to certain criteria, listed below. Take some time to find all the mistakes in the model (i.e. where the model does not conform to the criteria), and all of the specific criteria that have been implemented correctly in the model. Your objective is to be accurate and fast, with a maximum time of 5 minutes. Each time you identify a mistake or a correct feature, note it down and indicate your certainty out of 10.

## 7. Task 1 continued - First Method \*

The criteria are shown below:

### General Criteria:

- Objects should not collide with each other in a physically impossible manner
- Objects should be in a normal position and orientation – identify anything that seems strange

### Specific Criteria:

- There should be 10 or more objects to sit on (one couch is still one object)
  - There should be the same number of windows on each of the long faces of the room
  - The room should be lit by 10 lights
  - There should be two double-doors leading to the balcony
  - Windows on the long edges of the room should approximately stretch from the floor to the ceiling (disregarding the frame)
  - Every chair should be oriented towards at least one window, disregarding furniture between the chair and window
  - There should only be 3 types of seating
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## 8. Task 1 continued - Second method \*

The same things as the previous question, but this time using the other device or method. You are looking for additional errors that were not found in the first method.

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## 9. Task 2

a) The windows on the long edges of the room currently use a certain type of glass, which has recently been found to be faulty. Please annotate the paper to indicate this, or highlight the windows red on the AR model. b) The windows now need to be removed from the model to be replaced by new windows. Annotate the paper to indicate this, or remove them from the AR model.

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## 10. Task 3 \*

Assume that the kitchen design is for a new kitchen in your new house. Briefly describe to us what aspects you like, and what aspects you don't like.

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## Section C - Post Experiment Questions

## Augmented Reality

11. 1. How easy would the AR model be for a non-engineer to understand?

*Mark only one oval.*

	1	2	3	4	5	
Very Difficult	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very Easy

12. 2. How easy was it to visualise the exterior of the rooms in the AR Model?

*Mark only one oval.*

	1	2	3	4	5	
Very Difficult	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very Easy

13. 3. How easy was it to visualise the contents of the rooms in the AR model? (e.g. tables, chairs, windows)

*Mark only one oval.*

	1	2	3	4	5	
Very Difficult	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very Easy

14. 4. How easy was it to express to us what you liked and didn't like about the kitchen while using the AR model?

*Mark only one oval.*

	1	2	3	4	5	
Very Difficult	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very Easy

## Paper

15. 5. How easy would the paper model be for a non-engineer to understand?

*Mark only one oval.*

	1	2	3	4	5	
Very Difficult	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very Easy

16. 6. How easy was it to visualise the exterior of rooms in the paper model?

*Mark only one oval.*

	1	2	3	4	5	
Very Difficult	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very Easy

17. 7. How easy was it to visualise the contents of rooms in the paper model? (e.g.tables, chairs, windows)

*Mark only one oval.*

	1	2	3	4	5	
Very Difficult	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very Easy

18. 8. How easy was it to express to us what you liked and didn't like about the kitchen while using the paper model?

*Mark only one oval.*

	1	2	3	4	5	
Very Difficult	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very Easy

## General

19. 9. How easy was it to interact with the AR model? e.g. rotating, placing

*Mark only one oval.*

	1	2	3	4	5	
Very Difficult	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very Easy

20. 10. Which system held your attention more?

*Mark only one oval.*

	1	2	3	4	5	
Paper Significantly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	AR Significantly

21. 11. Which system was better for making changes to the design?

*Mark only one oval.*

	1	2	3	4	5	
Paper Significantly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	AR Significantly

22. 12. If this were your new house, would you feel more affinity for it when viewing it in AR or on paper?

*Mark only one oval.*

	1	2	3	4	5	
Paper Significantly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	AR Significantly

Please indicate your level of agreement with the following statements

23. 14. The AR tutorial prepared me well for use of the system.

*Mark only one oval.*

	1	2	3	4	5	
Strongly Agree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly Disagree

24. 15. While using the AR system, I remained able to interact with the real world ([e.g.to](#) write on a whiteboard or read from paper).

*Mark only one oval.*

	1	2	3	4	5	
Strongly Agree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly Disagree

25. Any thing else you would like to add about your experience, the app, or the research.

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