# **Design Points**

# Scenes

## A - Main Menu:

* Launch test
* Start experiment (starts at scene1 & goes through to scene 4)
* Select scene (takes you to a screen where you can individually select scenes & variables)
* Settings
* Quit

## B - Calibration Scene (Control Scene):

**What:**  
Press the button as quickly as you can when a light in the virtual room turns red.

**Why:**  
To get a control time for each of the user’s reaction time, something to compare the rest of the user’s results to. This also teaches the user the basic input needed for the actual test, as it will be the exact same controls and mechanisms.

**How:**  
Occurs at the very start of the test, the user gets 5 attempts & the average (median) is taken from the 5 attempts.

## C - Scene 1:

## The car in front of the driver suddenly emergency stops, will crash if nothing is done.

## D - Scene 2:

## Pedestrian crosses the road (not at a suitable crossing), directly in front of the car, will crash if nothing is done.

## E - Scene 3:

**Traffic light turns red** as the driver approaches it, you will go through the red light if nothing is done.

## F - Scene 4:

A **car at a junction pulls out too late** as you approach, you will collide if nothing is done.

# Driving Variables:

* Audio only Sat Nav
* Visual only Sat Nav
* Audiovisual (Audio + Visual) Sat Nav
* Programming a Sat Nav

These will all be done either **WITH loud music** or **WITHOUT loud music** (volume > 95 decibels), and will be chosen in a random order with the scenes so that it promotes randomness and fairness.

## Fail state for Audio/Visual/Audiovisual Sat Nav Tasks:

The user will have 3 seconds to do a task, otherwise it will be a fail. If the user does the wrong direction in the task then it will also be a fail. If the user completes the task correctly and within the allotted time then it will be a pass.

## Audio Only Sat Nav:

No mounted Sat Nav or display on anywhere, simply the audio for the direction to go on the thumb stick (left/up/right/down). A short fail sound will occur with each error, and a short pass sound will occur with each success.

## Visual Only Sat Nav:

Mounted Sat Nav display in the center of the front of the car (like most vehicles), no audio for sat nav though. The screen will display a direction (left/up/right/down) for the user to input on the thumb stick. The screen will turn red with each fail, and green with each success.

## Audiovisual Sat Nav:

Mounted Sat Nav display in the center of the front of the car (like most vehicles), with the audio instructions playing simultaneously too (basically both visual and audio prompts working together at the same time) with the same directional inputs (left/up/right/down) on the thumb stick. A short fail sound will occur with each error & the screen will turn red. A short pass sound will occur with each success & the screen will turn green.

## Programming Mounted Sat Nav:

Mounted Sat Nav display in the center of the front of the car (like most vehicles) where a word will be displayed on the screen (postcode, address, etc.) and the user will have to type it in and submit it using a virtual keyboard that will appear below the Sat Nav (will have to be big enough so that it’s easy to select letters, but small enough so that it doesn’t obstruct the view of the Sat Nav or the road). If the user submits an incorrect word then it will count as a mistake (input fail) they will have to try to type the word again until they get it correctly. If the user submits at least 2 correct words in the list before the end of the test it will count as a valid attempt (pass) otherwise it will count as a failed attempt, words will keep coming until the end so that the user is still looking at and using the Sat Nav when the trigger occurs.

# Experiment

## Test Timeline:

1. User chosen to listen to music or not by me (1:1 ratio desired for whole test group)
2. Order of variables chosen
3. Scene order chosen
4. Scenes paired with variables
5. Scenes run in order with the user’s input to start them
6. User inputs the required actions during the test
7. Test stops and results are recorded by saving results to a file + printing results on screen (to be written down in case of technical fault)
8. 1-minute break between scenes (or as long as the tester needs)
9. Next scene starts
10. Repeat steps 5-8 until no more scenes
11. Turn off any recordings and finalise results

## Quantitative Data:

* Reaction times per scene & distraction (table: scene columns, distraction variables rows)
* Average reaction times per variable and/or scene
* Boolean value (crash or not) per scene & distraction
* Boolean value per scene (user was too early. Did they activate the stop before the trigger even began?)
* Integer value (input fail number – for sat nav inputs)
* Float value (input fail percentage – for sat nav inputs) [total fails/total satnav queries]
* Feedback forms (SSQ/VRSQ, questionnaire – 1 to 5 rating for each answer, etc.)

## Qualitative Data:

* Demographic data (age, sex, race, work, relationship status)
* Screen Recordings of tests in the oculus

# Results Tables

Example **Reaction Time** Table (milliseconds) for a User:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Audio Sat Nav | Visual Sat Nav | Audio + Visual Sat Nav | Programming Mounted Sat Nav |
| No Music | 230 | 431 | 324 | 951 |
| Loud Music | 543 | 630 | 372 | 1209 |

Example **Crash** Table for a User:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Audio Sat Nav | Visual Sat Nav | Audio + Visual Sat Nav | Programming Mounted Sat Nav |
| No Music | False | **True** | False | **True** |
| Loud Music | **True** | **True** | False | **True** |

Example **General Fail** Table for a User:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Audio Sat Nav | Visual Sat Nav | Audio + Visual Sat Nav | Programming Mounted Sat Nav |
| No Music | **True** | False | False | False |
| Loud Music | False | **True** | False | False |

Example **Sat Nav Input Fail Number** Table for a User:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Audio Sat Nav | Visual Sat Nav | Audio + Visual Sat Nav | Programming Mounted Sat Nav |
| No Music | 2 | 5 | 3 | 2 |
| Loud Music | 5 | 4 | 7 | 1 |

Example **Sat Nav Input Fail Percentage** Table for a User:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Audio Sat Nav | Visual Sat Nav | Audio + Visual Sat Nav | Programming Mounted Sat Nav |
| No Music | 15% | 30% | 25% | 100% |
| Loud Music | 50% | 35% | 66% | 50% |