

Assignment 2: Artefact  
Touchless Gesture Interface for Digital Kiosks

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## Contextualisation



Figure 1. OLIVER, Ryan. 2022. Airwave Kiosk prototype screens

The research paper conducted prior to this assignment focused on the design and use of digital kiosks in smart cities. From this research, an unexpected novel issue was highlighted from primary research. During the age of Covid, some users are less likely to interact with shared public devices such as digital kiosks due to the potential for transmission via the touchscreen or physical input methods.

The artefact created to tackle this issue is a prototype for a touchless, gesture-based UX for shared digital kiosks - 'Airwave Kiosk'. By utilising a gesture-based NUI, the public should feel more confident in using these shared devices without worrying about disease transmission. This is important to address now, as hygiene fears over shared devices will almost definitely linger long into a post-covid world.

Additionally, the prototype responds to other findings from the research paper, including adding a more prominent welcome screen with real-time video to promote interaction with passers-by and combat 'interaction blindness' (Ojala et al. 2012: 47) that was noted in some participants. The key features that the study participants desired were also added, including transport routes/times, high street maps/shops, emergency contacts, and tourist information. By incorporating these findings into the design, the prototype kiosk should prove more alluring than current kiosk UI designs, appearing less static or like an advertisement board from initial viewing. The features and information provided by the airwave kiosk will be more relevant to the public than current kiosks, due to the survey responses informing the design, and will enhance users experience and understanding of the smart cities they inhabit.

The touchless interface prototype as it stands is a good grounding for future development and testing. The gestures are straightforward enough to grasp quickly, and the overall design is simple enough to hopefully be easily understood by many. Future testing of the prototype with users would require the setup of a motion tracking device, such as the Azure Kinect. To understand the real-world practicality of the gestures, testing with a group of people with differing abilities would be required, to ensure that everyone can perform each gesture comfortably. Future development should aim to broaden the functionality of the Airwave kiosk and refine the UI design. The Motion camera could have a secondary use, such as recording feedback from users for council surveys, while the UI aesthetics should be further refined. The use of sound could be used in future iterations to provide feedback for when an option has been selected, as the lack of feedback may confuse or annoy some users.

# Development

## Gesture vs. other NUI

Having researched the different possible methods for touchless interfaces, hand tracking gesture control appeared to be the most appropriate for a shared digital kiosk in a town centre. When compared to voice control, gesture control would work better in louder situations around cities such as train stations or shopping malls. Other options such as using a mobile phone as a peripheral to control the screen would limit potential users, pushing out those who would most likely require the kiosk the most- those without mobile access.

## Responding to best practices

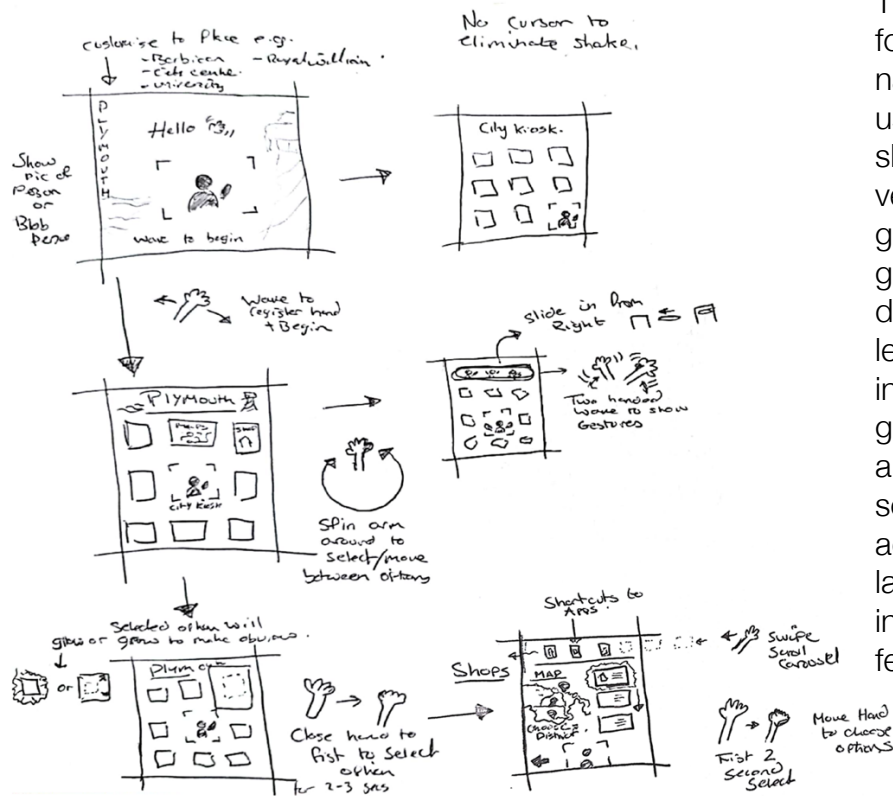
**Eliminate the cursor:** - Due to the potential for jitter with gesture control and a lack of accuracy (Hasoshyn and Chalyi. 2014), a cursor takes too much attention and time for users to comfortably navigate the UI. The prototype uses an 'on-rails' approach to mitigate this, whereby an orange glow signifies the highlighted button and moves from one button to the next, rather than a free-moving cursor.

**Use of time and delays:** - To ensure that gestures are deliberate, and that accidental movements or actions do not interfere with the use of the kiosk, a 2-second fist gesture is used in the prototype to select options. This allows accidental gestures to be ignored/corrected by users and less frustration from unnecessary toing and froing between pages.

**Two-Handed gestures:** - A possible way of lowering fatigue is by using two-handed gestures (Vogiazou, 2016). This, however, would be inappropriate for the digital kiosk in a city centre. Users in cities are likely to have only one hand free to interact with the kiosk due to holding, for example, shopping bags, a child's hand, or an umbrella. Subsequently, single-handed gestures only were included in the prototype.

**Keep it simple:** - As this is a shared outdoor device, users would not have the time or desire to learn many different or complicated gestures. As such, the prototype utilises 3 simple one-handed gestures for operations. This will also allow for expansion and development in the future, following user testing to expose new gesture possibilities, such as additional swipe, pinch or scroll gestures to enhance the capabilities of the UI.

# Concepts and Wireframes



The initial design process focused on the gestures used to navigate the UI in place of the usual touchscreen controls. The sketches (left) show an earlier version that required more gestures and two-handed gestures. This was changed during development (below) to a less cluttered design, simple interface and navigation by 3 gestures. The kiosk functions are laid out like apps on a home screen, with the potential for additional features to be added later through updates to individual kiosks, based on user feedback.

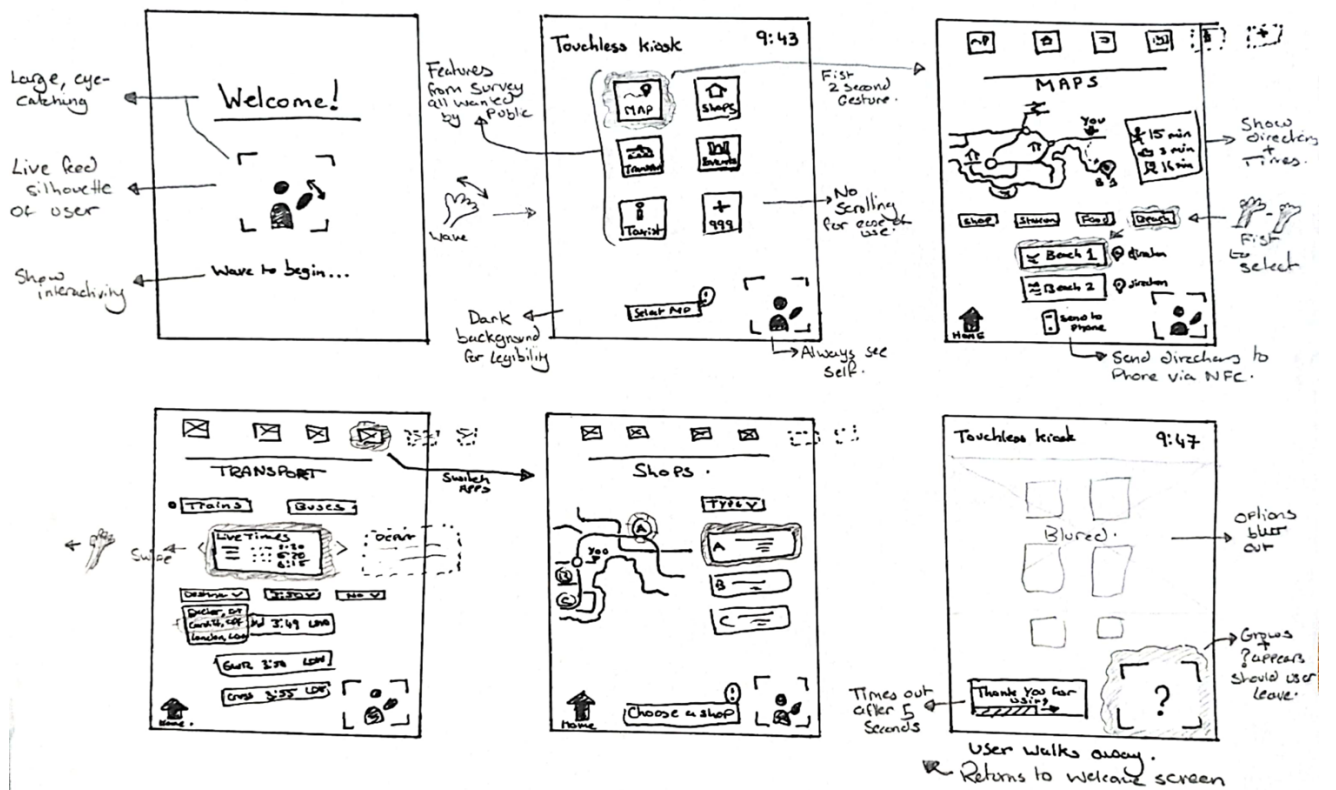

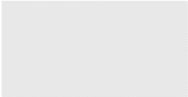





Figure 2. OLIVER, Ryan. 2022. Wireframe Sketches of Airwave

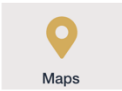
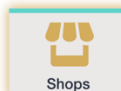
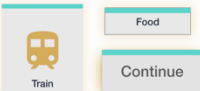
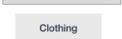
# Style Guide

## Touchless Kiosk Style Guide

### Colour Palette

	Main Background #5D6064 - 242e3f (Linear Gradient)
	Light Backgrounds #e8e8e8
	Highlights #d3ac5c
	Additional Highlights #5cd3ca
	Typography #252F3F

### Button Styles

Button	'Click'
	
	
	

### Typography

Helvetica Neue (Medium)  
Helvetica Neue (Regular)  
Helvetica Neue (Light)

H1

H2

H3

Body

### Cursor

'On-Rails' cursor that moves between selectable objects, appearing as a glow around buttons.



### Icons

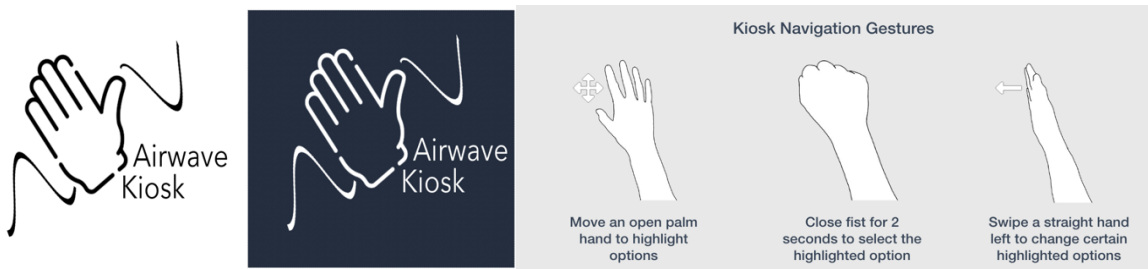
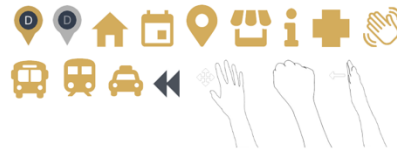


Figure 3. OLIVER, Ryan. 2022. Airwave Kiosk Style Guide

# The Artefact

Link to Video of Prototype on YouTube: <https://youtu.be/AWEHxn94IRc>



Figure 4. OLIVER, Ryan. 2022. Airwave Kiosk Concept. Adapted from: GO Design, 'WiFi network Multi touch floor standing LCD ad display digital signage display touch monitor. 3d render illustration' Shutterstock.

## Bibliography

- HASOSHYN, Oleh and Mike CHALYI. 2014. 'Touch-Free Interactions as an Innovative Approach to Audience Engagement'. UX Magazine. [online] Available at: <https://uxmag.com/articles/touch-free-interactions-as-an-innovative-approach-to-audience-engagement> [accessed 27th Dec 2021]
- OJALA, Timo, Vassilis KOSTAKOS, Hanni KUKKA, Tommi HEIKKINEN, Tomas LINDEN, Marko JURMU, Simo HOSIO, Fabio KRUGER and Daniele ZANNI. 2012. 'Multipurpose Interactive Public Displays in the Wild: Three Years Later'. Computer 45(5), 42–9. [Online] Available at: doi: 10.1109/MC.2012.115 [accessed 29th Nov 2021]
- VOGIAZOU, Yanna. 2016. 'Beyond Touch: Designing effective gestural interactions'. inVision. [Online] Available at: <https://www.invisionapp.com/inside-design/effective-gestural-interaction-design/> [accessed 23rd Dec 2021]

## List of Figures

Figure 4: OLIVER, Ryan. 2022. 'Airwave Kiosk Concept'. Adapted from: GO Design. 'WiFi network Multi touch floor standing LCD ad display digital signage display touch monitor. 3d render illustration' [Image] Shutterstock. [Online] Available at: <https://www.shutterstock.com/image-illustration/wifi-network-multi-touch-floor-standing-1028862031> [accessed 2nd Jan 2022]

## List of Tools Used

Adobe XD – Prototype  
Photoshop – Style Guide and visualisations  
Illustrator – Graphics for prototype  
Premier Pro – Video of Prototype  
Pen and Paper – Wireframes and sketches