UX design Guidelines

AR wearables
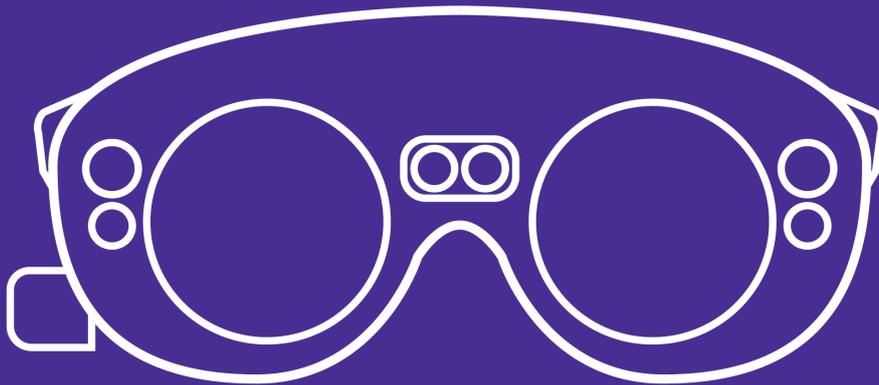
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Introduction

This document contains the UX guidelines for AR wearables that resulted from the research I did. The guidelines are divided into 5 categories. These categories are the five main UX principles: Accessibility, Hierarchy, Confirmation, User Control and Consitency.

Accessibility

Tutorial

To increase the usability of the application, it is advised to make a tutorial for the application. This tutorial can be a manual, but it is better to implement a tutorial with visual and audio elements. The users should learn by doing to give them the best onboarding. Let them complete tasks before they can continue with the tutorial.

Tooltips
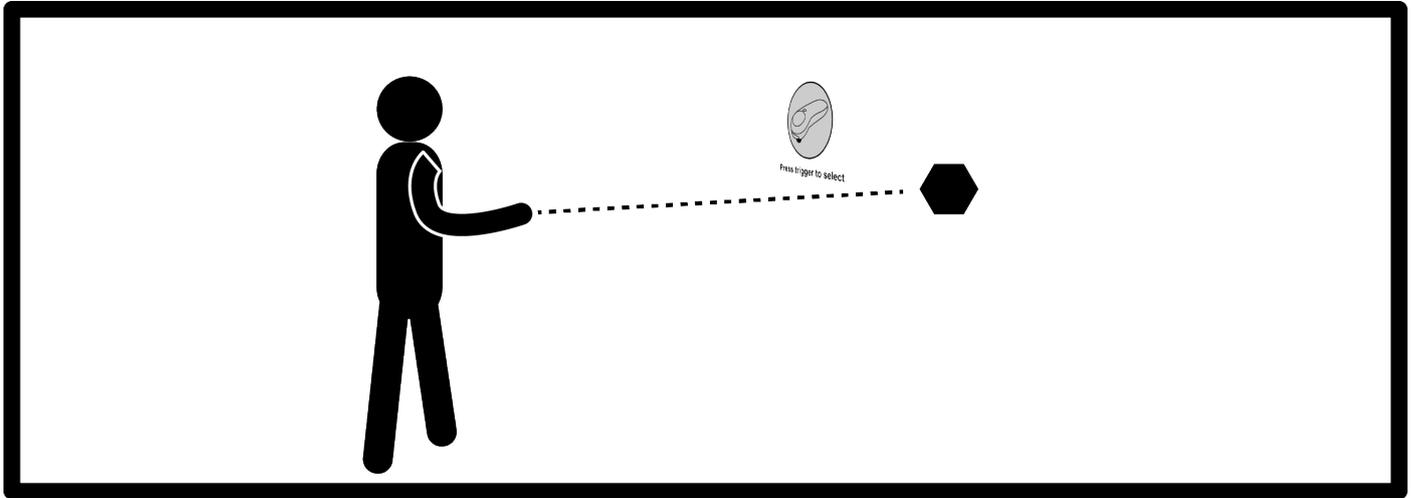
The user should be given the option to get help from tooltips. These tooltips float in front of the interaction and show the user what to do to finish these interactions.

Handedness

When designing menus that are locked to an arm, it is advised to keep handedness in mind. Left-handed people tend to have difficulties controlling a menu that is made for righthanded people. Build in a setting that makes the position of the menu interchangeable.

Reaching objects that are out of arm range.
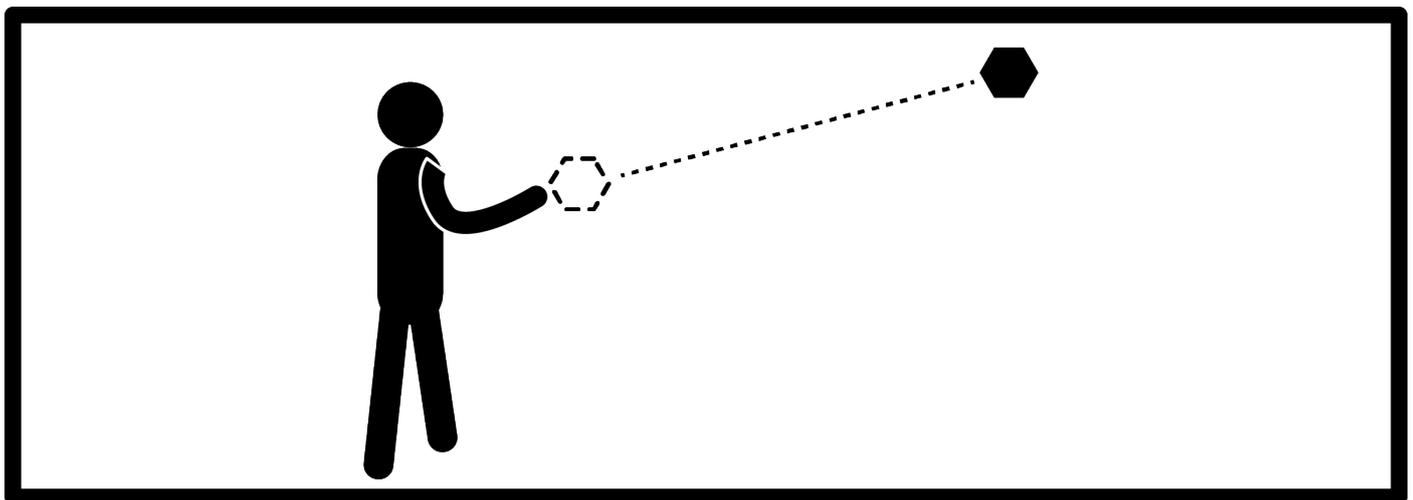
When objects spawn out of physical reach of the users, give them the ability to get that object within reach. This can be done by a laser coming out of a controller. When only using hands as a means of control, this could be achieved by using a certain gesture, like pointing, to get the object within reach.

Hierarchy

Menu placement

Within AR wearables, the menus can be placed in a lot of different places. However, each way of placement has its advantages and disadvantages.

Arm mounted menus

A menu on the arm, which is controllable with the hand on the other arm, gives users a feeling that they are augmented. This kind of menu can be used as the main menu, with approximately four buttons. Too many buttons will make the menu too crowded.

Controller menus

A menu placed in front of the controller is ideal for object manipulation. A user can always see what kind of interactions are available and can keep the object being interacted with in the same FoV.

Wall mounted menus

Wall mounted menus are used best when a menu is used for a specific room or place. These menus need enough flat vertical space to put on.

Vertical floating menus

When a message needs to be shown or important tasks must be completed, a vertical floating menu is best used. For instance, a settings menu can best be placed on a vertical plane. This menu can be used everywhere, as it does not require any anchoring in the digital world.

**Menus with less usability within context**
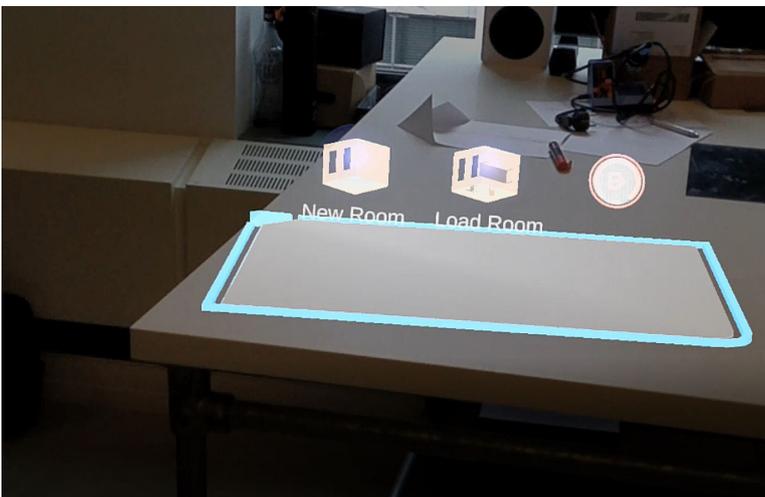
A horizontal menu is like a table with the menu buttons on it. To look at the menu the user has to look down. With this position of the head, together with the weight of the AR wearable, users experienced neck fatigue. Additionally, when using hand tracking to click a button, the chance of touching other buttons as well, is higher than with vertical menus. Overall, horizonal menus are hard to use.

Menus anchored to an object are, with the current state of hand-tracking, only usable when within hand-reach of the user. However, when no controller can be used, this could be the way to go when manipulating objects.

Heads up displays are too much in the FoV of current AR wearables. Also, when a user tries to look at the HUD, the HUD keeps moving out of sight, because it is anchored on the side of the FoV. However, when making an application that is just overlaying the real-life world with information without much interaction needed, a HUD could be useful.

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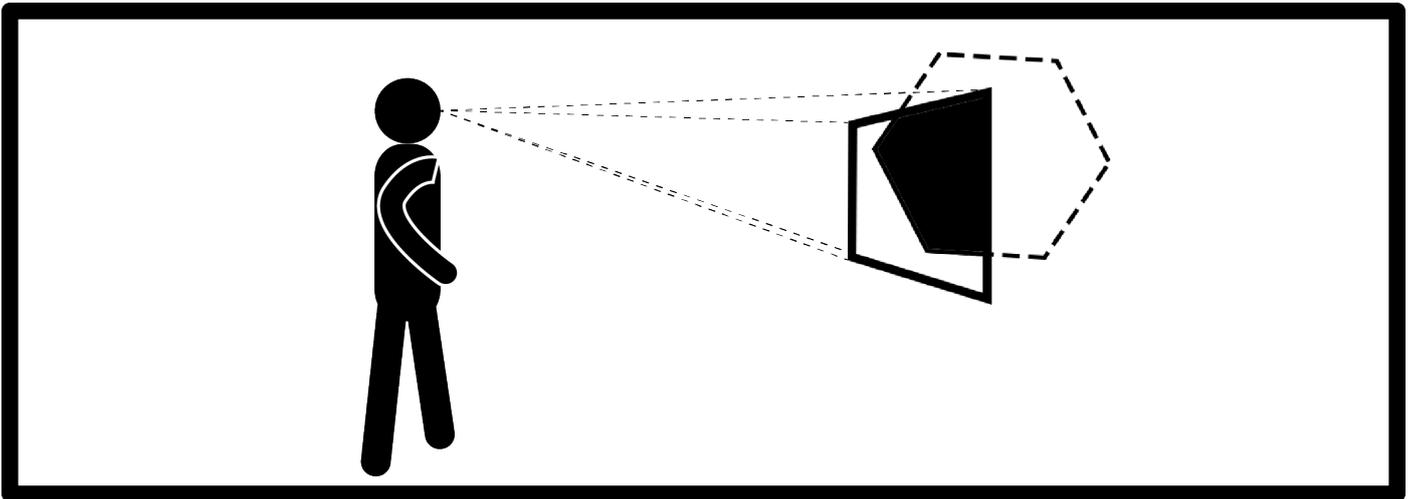
Field of View (FoV)

Because the AR wearables do not have a very big field of view, it is advised to let the main function of the application take up this whole space. For wearables, the AR experience should be full screen, menus should be hidden and only visible when needed.

Objects within the application should be small enough to fit into the FoV. If not the user could lose immersion by seeing an object getting cut off in the middle of his viewport.

Heart pulse
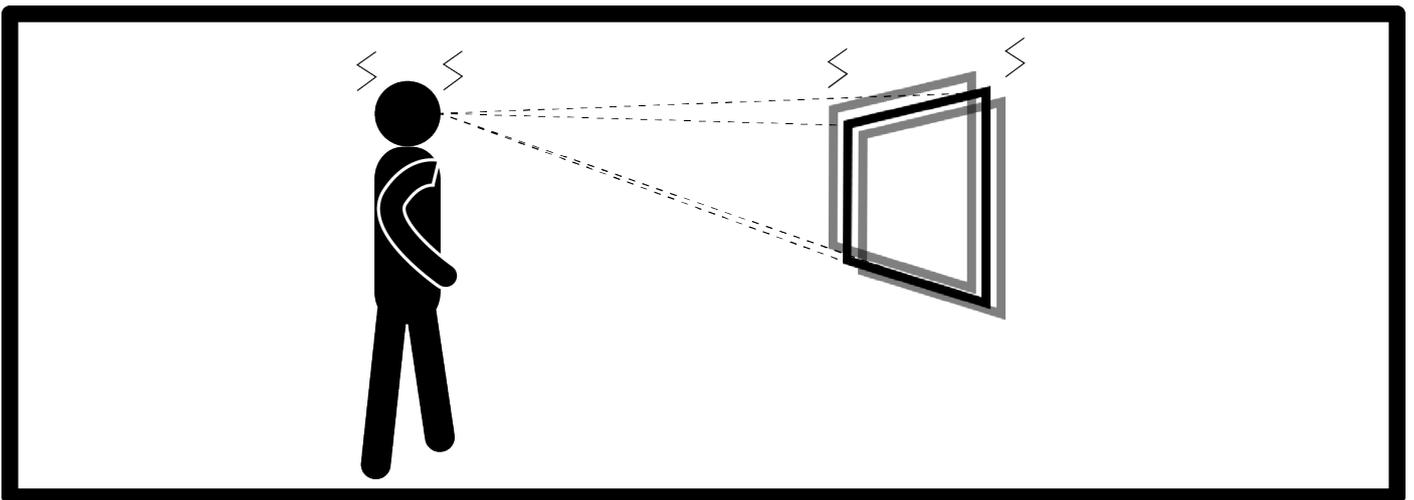
Never lock a menu to the viewport of the user, because the heart pulse within the head will make the menu vibrate too, making it hard to read.

Confirmation

Feedback

The way feedback is given is important. Visual, audio and haptic feedback should all be used when possible. This paragraph explains how they can be used to have an optimal user experience.

Visual
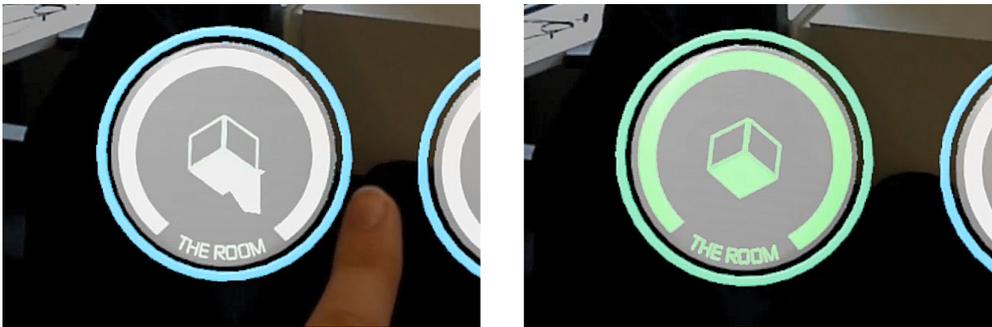
Visual feedback is the most obvious type of feedback that can be given. Whenever the user interacts with something, be sure to show the user. AR wearables are a new way of interaction, and when users get lost in the application, it will give them a bad experience. Visual feedback can be given by change of colour or size, but also by showing animations.

Audio

Audio feedback is best given combined with visual feedback. Give every interaction a clear sound, so after a while, the user knows what he is doing by only listening to sounds. Selecting, deselecting, confirming, switching and deleting should all have different sounds.

Haptic feedback

Use haptic feedback whenever possible, for instance when selecting an item. The Magic Leap has a controller that can give haptic feedback, but other AR wearables might not have this. In that case, haptic feedback is hard to give.

Irreversible actions

Whenever an irreversible action is done, like deleting a saved scene, the application should alert the user of this action.

User Control

Controller

If the device has a controller supplied with it, it most likely is the best way to control it. The Magic Leap One has a supplied controller which can be used for precision controls of the environment. This controller is by far the best option within the Magic Leap.

Hand-tracking

Hand-tracking is not optimized yet. Most AR wearables cannot track the hands very precise, so for precise interactions it is not advised to use hand-tracking. It can however be used for simple interactions, like pressing something. Gestures can also be used to call a menu when necessary.

Eye-tracking

Eye-tracking, like hand-tracking, is not optimized yet. Eye-tracking needs the device to be calibrated for every new user. This makes showcasing very hard because there is a chance that the eye-tracking will not work properly. For now it is the least recommended way of user control.

Consistency

Visual consistency

Black must never be used when designing for an AR wearable, because the wearable cannot render this. The reason for this is that it projects holograms. As with other products typefaces, colours, controls should always remain logically consistent.

Be consistent in when to use what way of interaction

Because AR wearables offer a lot of different ways of interaction, it is important that the way of interaction is always logical. Do not use hand-tracking and controllers as a mix for a certain interaction, because this will be confusing for the user. Menus should also be controllable one way or the other.