

PRODUCT BIOGRAFIE

EMERGING TECHNOLOGIES

COOKING WITH MIXED REALITY

Communicatie Media Design Thema Semester

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Versie 1.0

Zero hunger

In dit document deel ik het proces van mijn Mixed Reality concept: koken in Mixed Reality. Je zult vervolgens ontdekken wat mijn doelstellingen zijn, hoe ik onderzoek heb uitgevoerd, welke conclusies daaruit voortkwamen en het volledige proces van het bouwen van mijn prototype.

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DESIGN BRIEF

Leren koken met Mixed Reality

Fascinatie

Graag zou ik mezelf technisch willen uitbreiden op het gebied van virtuele realiteit, waarbij ik ook rekening ga houden met het maatschappelijke probleem verantwoord consumeren en produceren. Om rekening te houden met het maatschappelijk probleem wil ik consumenten adviseren om ingrediënten lokaal aan te schaffen en motiveren om het ingrediënt te respecteren en volledig te consumeren. Dit concept is een gemengde werkelijkheid concept dat geprototyped wordt in virtuele realiteit. Gemengde werkelijkheid is een mix van de fysieke en digitale wereld, waardoor natuurlijke en intuïtieve 3D-interacties tussen mens, computer en omgeving bijeenkomt.¹ In VR wordt een zo realistisch mogelijke keuken gemaakt. Vervolgens ziet de gebruiker gebruikersinterfaces en visuele elementen die dienen als hulp tijdens het koken, je kan hier denken aan aanwijzingen waar de gebruiker moet snijden voor specifieke ingrediënten zoals een hele zalm fileren, een gebruikersinterface dat opent en laat zien wat je allemaal kan doen met de resten van de zalm, het graat en de kop waar je bijvoorbeeld een lekkere bouillon zou kunnen maken. Ten slotte moet het ook aanbevelingen geven aan de gebruiker om lokaal boodschappen te doen waarbij het geld terug circuleert in je lokale gemeenschap. Voor gemengde werkelijkheid ga ik kijken naar de gebruikerservaring van het systeem, denk hierbij aan of de gebruiker de ontwerpkeuzes begrijpt.

Drivers, verantwoord consumeren en produceren ², iedereen kan later verantwoordelijk koken en consumeren met gemengde realiteit. Op dit aspect na denk ik dat het project al uitvoerbaar is. Door gebruik te maken van gemende realiteit kan er onderzocht worden of de uitvoering daardwerkelijk gebruiksvriendelijk is en of het ethisch verantwoord is.

Signals, kookworkshops, beleid over minder vlees consumeren, verantwoord consumeren en produceren, virtuele/fysieke kookboek, basiskennis koken, produceren, kookvideo's, kookschool, fysieke ervaring in de horeca.

Kookvideo's zoals Masterclass, gebruikers krijgen input van autoritaire figuren en worden goed geïnformeerd tijdens het kijken over de verschillende aspecten van een ingrediënt of keukengerei.³

Kookschool, leren verantwoord om te gaan met je ingrediënten door techniek, recepten, kennis uitbreiding en ervaring.

Inkopen van Ingrediënten in je lokale gemeenschap zodat het geld terug circuleert.

Een to-do van de “United Nation Goal 12: responsible consumption and production”.²

Toekomst Scenario

Mensen zijn bewuster gaan leven doordat ze verantwoordelijker zijn gaan consumeren en produceren. Ze hebben veel kennis over verschillende soorten ingrediënten waardoor ze bijna niet meer naar restaurants gaan, omdat het lekkerder, goedkoper en gezonder is. Daarnaast is de world wide waste voor eten drastisch vermindert tot bijna nihil. Met adviesen voor investering in lokale gemeenschappen worden deze terug tot leven gebracht. Mensen groeien/kweken nu ook veel meer eten of zoeken naar eten in het wild. Hierdoor stijgt het aantal bedreigde diersoorten.

Belangrijkste verschillen met vandaag en met het baseline scenario

Lokale gemeenschappen zijn bijna zelf voorzienend, mensen zijn sterker en gezonder dan ooit. Bijna geen restaurants verdwijnen waardoor er minder banen zijn in de horeca.

De ethische uitdaging is het eet patronen van de gebruikers respecteren en niet in de weg zitten. De dienst moet meer een toevoeging zijn aan hun leven dan een harde verandering, bewust consumeren en een balans vinden in paternalisme¹.

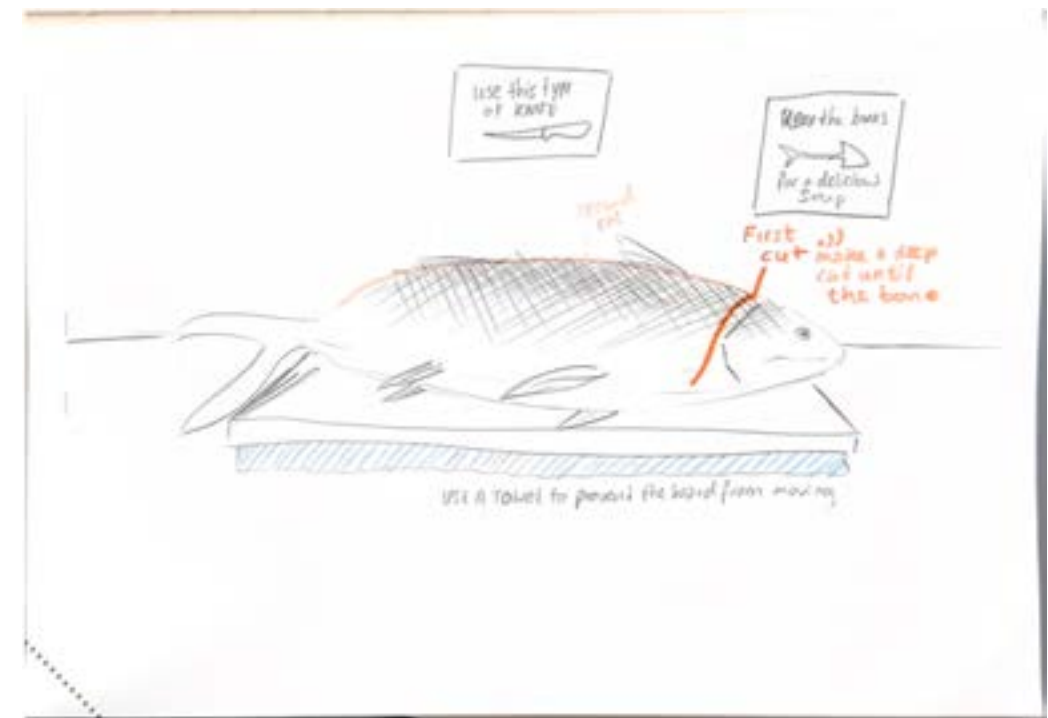
Motivatie

Sinds jongs af aan werk ik in de horeca en het is een groot deel van mijn leven. Koken is heel diepgaand en het is niet simpel om een lekker gerecht in een paar stappen klaar te maken. Het kost tijd om de wetenschap achter het koken te leren, de technieken en nog veel meer.

Een meeslepend ervaring biedt de gebruiker kook ervaringen met diepte in technieken, wetenschap en verschillende manieren om een gerecht klaar te maken naar wens. Als voorbeeld zou je een heel brood kunnen maken met minder koolhydraten wat toch lekker is en jouw dieet schikt door bijvoorbeeld patentbloem te gebruiken in plaats van tarwe bloem, omdat in patentbloem meer eiwitten zitten. Ook zou het systeem na een tijdje kunnen melden wat je kan doen met oud brood, bijvoorbeeld heerlijke croutons maken die je dan afbakt en weer voor een paar dagen extra kan gebruiken. Het doel van de meeslepende ervaring is om de gebruiker beter te leren koken door middel van gemengde werkelijkheid en om voedsel verspilling tegen te gaan.

Lo-fi tekening voor verduidelijking

De gebruiker krijgt tips door middel van user interfaces in je zicht. Je krijgt visuele elementen te zien zoals een rode streep wat aan geeft waar je moet snijden met instructies en daarnaast tips over wat je kan doen met de restjes van de zalm en veiligheid of er wel een doekje onder je plank ligt ja of nee.



CMD competenties waar ik extra aandacht wil besteden

Verbeelden en maken: uitgeschreven concepten uitwerken in virtual reality. Wat is een user friendly manier om bepaalde visuele elementen te tonen tijdens het koken.

Conceptualiseren: kijken naar bestaande oplossingen en daaruit een concurrentie onderzoek doen, zowel in Virtual Reality en wat er nu mogelijk is op het gebied van Mixed Reality bijvoorbeeld met de hololens.

Evalueren: het evalueren van de user experience met gebruikers, andere stakeholders, experts en collega's. Een user test afnemen en interviewen en daarop verder itereren.

Ontwikkelen en reflecteren: reflecteren op de kwaliteit van het product en hier een lering uit trekken. Visualisaties van de 3D objecten zo realistisch mogelijk maken en documenteren hoe ik tot het resultaat ben gekomen.

Ontwerpkwaliteiten die ik ga in zetten: Oog voor detail, nieuwsgierig, doorzettingsvermogen, onderzoekend, flexibel, doelgericht, enthousiast, gedreven, optimistisch, realitstisch en zelfdiscipline.

ONDERZOEK

Benchmark Creation

Findings

Cooking simulator - VR Game

Cooking simulator (Cooking Simulator VR on Steam, z.d.) is at the moment one of the best cooking games for virtual reality. They offer an realistic looking environment where you can cook with lots of different cooking utensils an machines.

Some key features:

- Hand poses generated in real time for every product and it's pieces
- Different resistance in products while cutting implemented through haptic feedback in controllers
- Career and sandbox modes
- Slow-motion mode available in sandbox. Cut the veggies in the air!
- Realistic physics
- Advanced cooking mechanics
- 80+ recipes
- 140+ lifelike ingrediënts
- Perks and skills to unlock.



images: (Cooking Simulator VR on Steam, z.d.)

Cooking simulator uses pop-up screen to assist you, it show the amount of ingrediënts you use on a product, red markings to indicate where the salt is falling or where you should cut.

With experience levels and daily rewards they encourage the players to play the game daily.



images: (Cooking Simulator VR on Steam, z.d.)

The screens are simply shown in the game. The recipes are organized and made clear by the icons and quantities. After bringing a finished dish you will see how you did it in the categories taste, time and overall score.

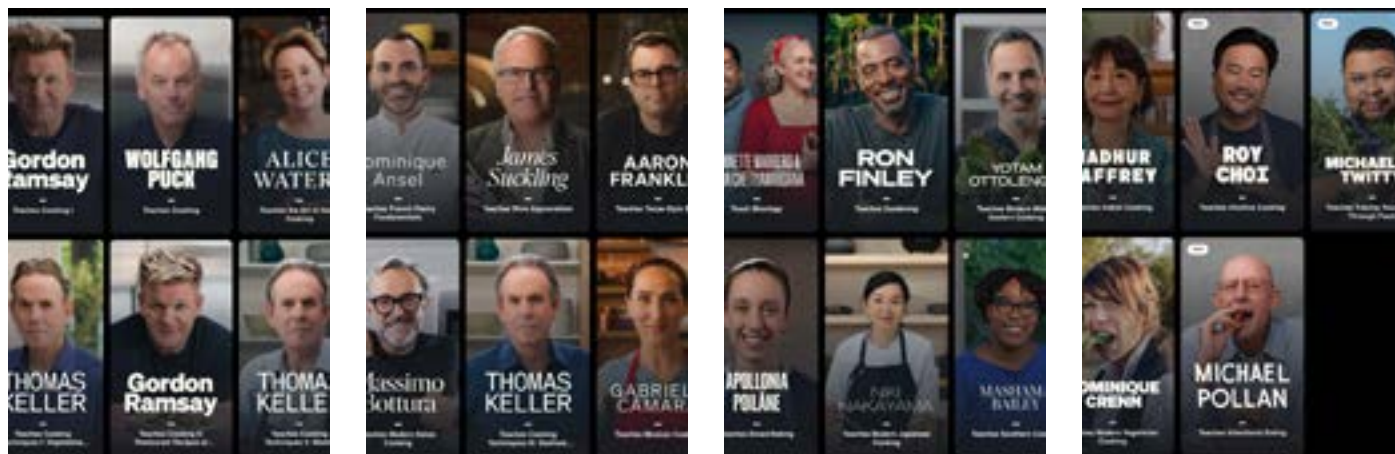
Masterclass

MasterClass is a streaming platform where you can watch hundreds of video lessons taught by 180+ of the world's best. Whether it be in business and leadership, cooking, writing, acting and more, it delivers a world class online learning experience. Video lessons anytime, anywhere on your smartphone, personal computer, apple TV and FireTV streaming media players (MasterClass, z.d.).

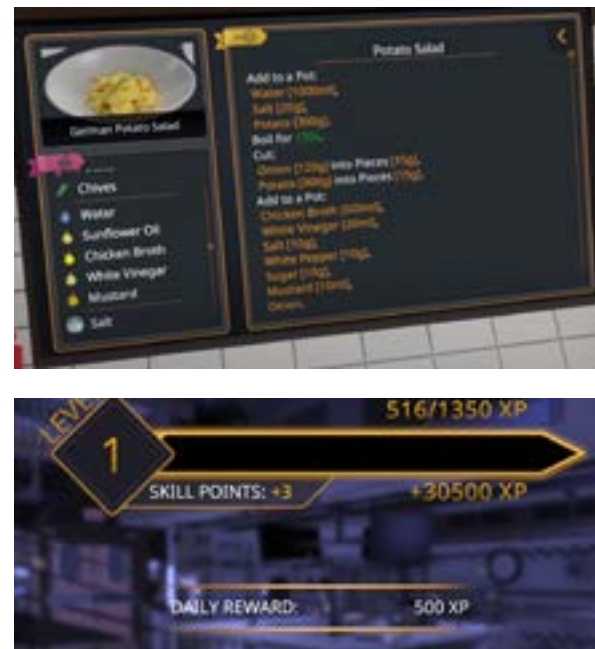
Strenghts of authorities

MasterClass uses the world's best to teach.

Naturally we trust people with authority. Experts are people who know what they are doing. This process starts from an early age, we are taught tha people in authority are always right. As example, peple in uniform often have authority. These people exude a certain authoirty. It is therefore easier to accpet things from these people (Koot, 2022). The cooking video's are from the world best (known) chefs.

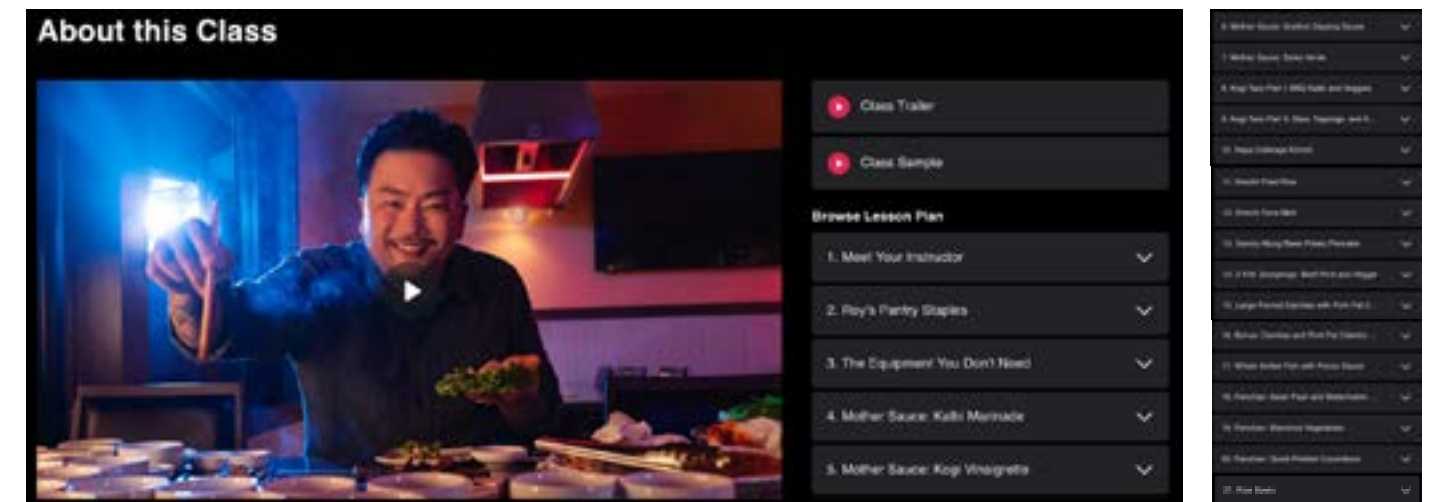


images: (MasterClass, z.d.)



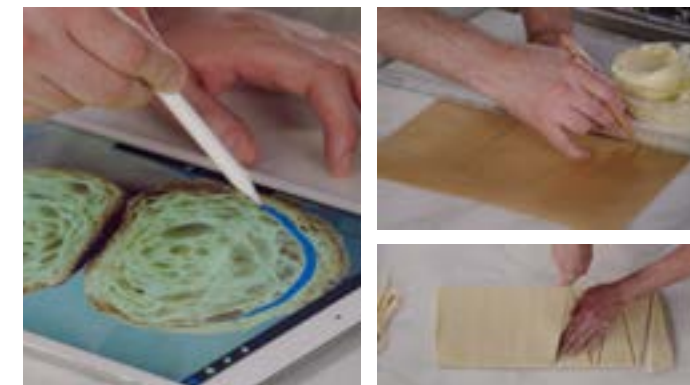
Instructions on video and paper

A MasterClass subscription costs €16 each month (billed annually) for all classes and sessions. When taking a class there are around 20 video lessons you can watch. The system offers an onboarding which the chefs introduces him/herself to you, they will tell you their history, cooking philosophy and their way of cooking. It varies from very delicate precise measured recipe's to recipe's you make with your taste and hands as cups. This system also offers the user a pdf format so they can always look back.



images: (MasterClass, z.d.)

MasterClass of Roy Choi, his specialty is cooking with you senses instead of cooking with measurements. Doesn't believe in precise cuts, he likes to use the wiggle room, likes to wiggle.



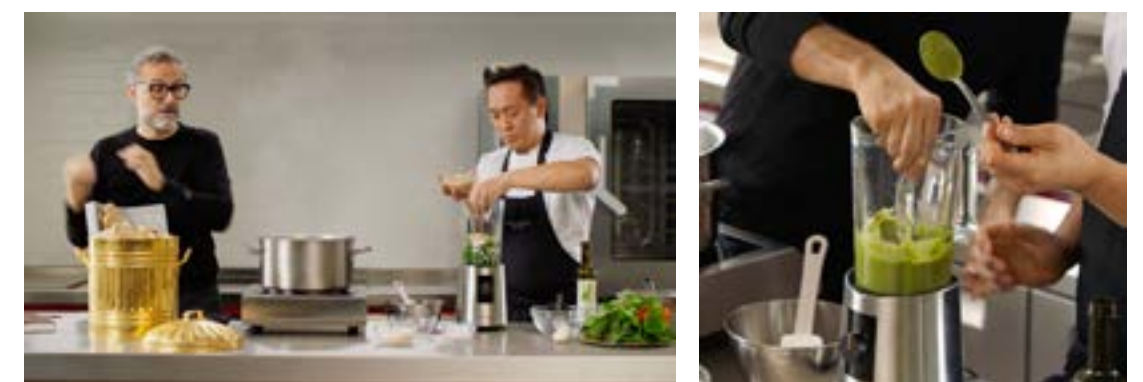
cooking with senses (MasterClass, z.d.)



cooking with senses (MasterClass, z.d.)

MasterClass of Dominique Ansel, James Beard award winning pastry chef. Teaches you how to create the best croissant it should be fluffy, flaky and light, the honeycomb should be all over. You should measure, prepare and plan.

MasterClass of Massimo Bottura, Teaches you the importance of tasting every step of the recipe. Adding salt, pepper at the end whilst tasting the sauce.



creating pesto with breadcumbs instead of pinenuts (MasterClass, z.d.)

MasterClass of Massimo Bottura, Teaches how to make a delicious vegetable broth of discarded vegetables. Collecting the vegetables in a zip-lock bag in the freezer. Dry the pieces in the oven at 40 degrees for 8 hours and you have a good base for vegetable soups.



Creating a vegetables stock with discard vegetables (MasterClass, z.d.)

Evaluation

Cooking with virtual reality offers an immersive experience that teaches the user how to mise en place, cook and plate. It has a lot of great features like real physics and 140+ ingredients. Masterclass teaches the user different kinds of cooking, precise cooking with a ruler, cooking with your taste buds and cooking with your senses. The user can participate in real time with the video or take their time and follow along on paper. The video's exist of recipe's, philosophy, tutorials on how to use certain utensils and what to do with leftover food.

Design Pattern Search

Introduction

In this section I am researching the design patterns for Virtual reality designs/games. I'll research games and do some desk research to find out the different designing pattern. After the results I will compare them.

Niantic Design patterns

In this section I will be specifying on specific Niantic designing patterns. To seem my full notes: <https://www.notion.so/Niantic-AR-Game-Design-101-cb27061b28ae45e18411344d87fefca5>

#1 Design for the real world

Paradigm Shift, Ar allows you to create experiences that are impossible in the digital space.

- Real world
- Physical location
- Player as the avatar
- Creating real world memories

The experiences, the player can be part of the experience, gameplay pixels converting to long lasting memories.



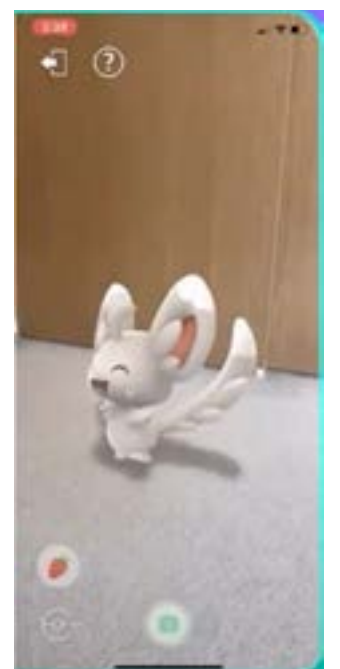
Visual objects in the real world (WN Media Group, 2020)

#2 Choose the right interaction layer

Have players interact in the World Space instead of traditional screen space.

1. User interface
2. Game
3. (new) Real world

The hub, world space is more engaging for players, it makes the experience more tangible, makes the experiences overall more fun.



Interacting with a visual object with touch in a real world space. (WN Media Group, 2020)

#3 Visual details matters

Makes sure your digital assets feel like they are interacting with the real world

- Shadows
- Lighting
- Ground planes
- Depth
- Scale

Augmented reality overlay vs Immersive Augmented reality



Immerging the visual objects in real world (WN Media Group, 2020)

#4 Integrate the device into the experience

Embrace the narrative potential of the physical devices instead of fighting it.

Examples:

- Ingress "Scanner"
- Pokemon Go "Camera"

Augmented Reality is constant changing, AR on phones and tablets, it could be very easy that the device is in the way of the experience make it a tool!



Very easy that the device is in the way integrate it in the devices (WN Media Group, 2020)

#5 Ergonomics! Don't tire your player

There is a physical component to engaging AR experiences

- Consider physical fatigue
- Keep AR sessions short
- Sweet spot: 00:30 - 02:00 hours
- Rest periods

AR players are using their energy, use your AR sessions short. Have them let a brake.

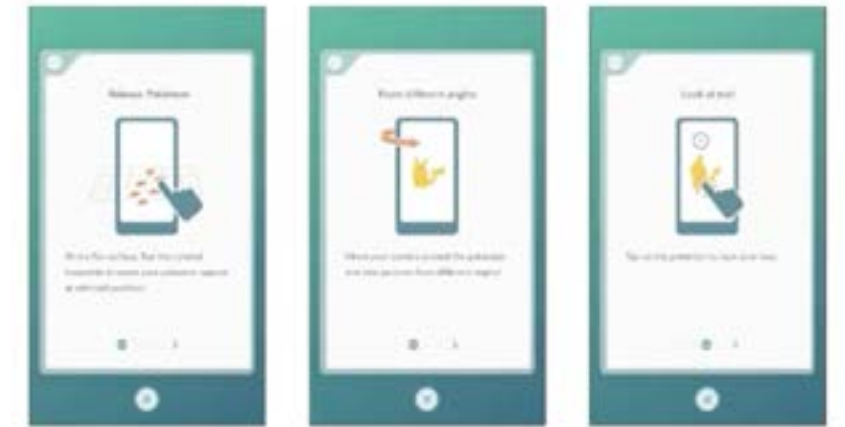
Active break sessions.



It is very tiring to hold your phone up for a long period of time (WN Media Group, 2020)

#6 AR Onboarding takes time

AR technology is still new to players! Start with the familiar. For a lot of players it's still a new experience, we worked with photo's, let them start on familiarity.



First few time they interact, very clear instructions, it can be very confusion, also have always accesibilty to the instructions (WN Media Group, 2020)

Lessons in AR Prototyping

Why do it?

- Find what's fun
- Inform design decisions
- Foster collaboration

Prototyping exposes us to challenge to overcome for the future. Different people have different feedback.

Prototyping: Finding the Fun

This video is from a hackaton project, our AR platform team had a new API. A lot of different AR ideas, team was not sure which to build. Old school pokemon fans we wanted to create something that made pictures of our pokemon in the real world. We created this prototype, to share it with the company and other teammates. Eventually we were able to put a team on our gosnapshot feature, single player AR photo taking experience. Also took off for the project a multiplayer feature this December.

gosnapshot feature which is realised after the prototyping (WN Media Group, 2020)



Prototyping: Informing design decisions

It broke your sense of immersion, you want to take a photo of pickachu but you end inside his head. Respecting their physical space, we let the pokemon flee, vanishing them with smoke clouds, pushing them back with the phone, we landed on a gradual blur when you got to close with a pokemon, this experience is relatable to taking a picture but when you get to close to something it'll get blurry. The natural reaction for people is backing off. Good example learning about the constraints of the device.

After getting to close your vision will get blurred, natural action is stepping back. (WN Media Group, 2020)



Prototyping: Fostering collaboration

Prototypes can be effective tools to use with cross-team collaborations.

- Give each prototype a purpose
- Get it into stakeholders' hands
- Get feedback

Prototypes can showcase the impact of small details that may not look too important on paper

AR is not a social norm (yet)

Make AR comfortable for you players and for those around them!

- Keep moving
- Active gestures
- Focus on ground and sky i.e. away from faces.

Prototyping: Quick dev tips

1. Mock the AR environment in unity to increase iteration speed.
2. Test your feature on as many different devices as possible.
3. Support devices incapable of immersive by ensuring those players have access to the same benefits

We want our game to be universal to everybody.

Encourage situational awareness

Give players the time and space to comfortable play while staying aware of their surroundings.

- Multitasking is hard
- Allow players to look up
- Don't pressure players, and don't force them to focus on screen. (no time mechanics)

Navigation

Where they are playing, and how they are playing. Pokéstops are 'safe locations' focussing a lot of area's around those players. Want to make sure that they're alert when using the application.

Game design document

It's surprisingly similar. one pager a summary of the feature. Start writing out more features after confirmation of teammembers. Where should the players be how long? Etc. a lot of basic game design rules universally.

Limitations of AR

Potential can or cannot create. Big issues, different devices have different chipsets like that certain iPhones would crash when they want to take a photo, it took a long time for us to recognize the problem and fixing it, eventually it was fixed by a unity upgrade, it was great but not concrete. AR platform teams are always pushing the limits of the experience.

Back up options!

No players should be blocked in their game by hardware issues. At least a way forward for them, if you want to reach a lot of folks having a backup is nice!

Evaluation

The Niantic Design Pattern Search is a valuable tool for designing and developing immersive augmented reality (AR) experiences. It allows developers to leverage the expertise and best practices of Niantic, a leading company in AR technology. This tool enables developers to work more efficiently by utilizing proven design patterns and solutions for common challenges in AR development. The Design Pattern Search provides a wealth of information and inspiration, empowering developers to stimulate their creativity and create high-quality AR experiences. It is a valuable resource that elevates AR development to new heights.

User testing for VR research

Playtesting VR: Brownboxing

introduction

This research is for prototyping my concepts for user testing. Brownboxing is a "paper prototype" method. It doesn't use screens but paper to boost the same experience.

Playtesting VR: brownboxing, spycams, and fuzzy rugs:

<https://gdcvault.com/play/1024863/Playtesting-VR-Brownboxing-Spycams-and-fuzzy-rugs>

Sketchnotes: Playtesting VR: brownboxing, spycams, and fuzzy rugs.

Practical process of Brownboxing.

- Set clear goals
 - ↳ make the trap reflective & let it ricochet back to the mission.
- remain flexible
 - ↳ set your goals in your questions, have a broad enough information gathering process to discover unexpected rough diamonds.
- Collecting Materials.
- Find the ideal location
 - ↳ 1. found distance from people trying to work/pricing space.
 - 2. Lighting that can be controlled.
 - 3. Space for finished product and raw materials.
 - 4. Power outlets.
- Construction tips.
 - A. top down sketch
 - B. limit duct tape
 - C. hot glue gun
 - D. Thicker markers
 - E. Print things out
 - F. Think outside the box.
- Spend your time on player feedback.

Time to Playtest your VR Brownbox

check list:

- brown box ✓
- The script ✓
- Questions ✓

Game pieces

- ↳ design master
- ↳ improve
- ↳ when and how to provide new information

Two types of data:

- Stream of consciousness
- Name & start time
- Goal related notes
- Unexpected actions
- Bugs
- Checkpoint Timestamps
- End time/total time

Four Magical Questions

universe across all games & experiences.

1. What was the most frustrating moment or interaction?
2. What was your favorite moment of interaction?
3. Was there anything you wanted to do that you couldn't?
4. If you had a magic wand to wave, and you could change, add, or remove anything from the experience, what would it be?

compare answers, recognize frustration trends, favorite, wanted, want

FFWWDD

5. When did you feel most clever?
6. How would you describe it to your friends?

put the answers in a spreadsheet.

Talk: Playtesting VR, brown boxing
by Shawn Patton

I expect you to die - playtesting in VR
VR game

naïf playtest

we had to predict what new players would do with it on a piece of paper and stuff it in an envelope before it.

Consequences of Newness

- too many vr glasses
- people (new) confused

Rapid Iteration playtesting

Tools of Rapid Iteration and Playtesting

- VR is new people act differently to it
- #1 paper prototyping
- #2 White Box
- #3 Brown Box

works well for UX & 2D Games

rich environments can be used to feel for the level.

It's fast, cheap everyone on the team can learn for the results

Best Analogy to VR is R (reality)

Benefits of brownboxing in VR

- Allows flexible staffing & team bonding
- They can enjoy the crafting.
- It's very refreshing than screens
- Thinking about what your player can reach for.
- ↳ Defines affordances
- ↳ Affordances allows
- ↳ Spheres of interaction
- ↳ Explore the movement of your player
- ↳ make sound effects with your voice.
- ↳ find usable results

Cons

- Requires physical space
- Multi room imagination
- harder to protect signals & magic
- (fake it) before false results from varying polish levels.
- set up things to let it stand out

Screen space Game

player action

Game world

VR Games

there's no middle so you are the bird.

Save time & money

25% savings

Set Guest Expectations for Brownbox

player

DEV

Thanks for coming. This is our brownbox. It will approximate what the final puzzle will be like.

As we progress, feel free to ask me to clarify what you see or what's happening. I'll fill in for anything the brownbox lacks. If I don't reply, I'm not being rude. I just want to see what you'll do. And remember, this is a huge help to us. If anything is confusing it's our fault, not yours, but please let us know.

Spy cam: How to playtest on phone-based VR systems

- Listen to the audio and guess
- Capture locally, play it back later
- Cast it in real time
- USB-C to HDMI
 - ↳ LG V50
 - ↳ ZenFone AR
 - ↳ Galaxy SP
- ↳ pixel or pixel 2 support

Take care of the Guest Fuzzy rug.

- ↳ Sanitary stuff

Playtest Boost Morale and Motivation.

- See your hard work in Game
- See people enjoying the game.
- Find the issues to tighten focus.
- Find blockers, clarify any pivots
- Make the next playtest awesome.

→ VR is new

→ Playtesting is critical


→ Brownboxing = Rapid physical Prototyping

→ Ask and Track the right questions

FFWWDD

→ Spycams for phone-based playtesting

→ Take care of the guest.

Before Session Begins	During Playtest	Ending the playtest
Equipment <ul style="list-style-type: none">❑ Ensure Headset & Lenses are clean before each individual use. Establish Comfort <ul style="list-style-type: none">❑ Query user about familiarity with VR❑ Show unfamiliar equipment & describe function❑ Establish your position relative to them in the real world❑ Describe what tester will be able to see (Rift) or not (Gear) ❑ Verify Calibration, if possible❑ Assist player with donning<ul style="list-style-type: none">a. headset<ul style="list-style-type: none">❑ consider glasses - needed? Help get them into headset if so.b. controller(s)c. Headphonesd. Settle Umbilicus if applicable❑ Assist with calibration if needed	Spatial Manners <ul style="list-style-type: none">❑ Avoid side conversations - talking over player is rude.❑ Let player know if you're changing position or swapping hosts out❑ Avoid laughing at player's actions - they can't see your friendly faces and may not know you're with them.❑ Check in verbally with player so they know you're still there and invested. System Specific <ul style="list-style-type: none">❑ You can't always tell if they enter in-headset menus, so warn them what they look like (dimmed world, can't interact, etc... ahead of time).❑ Help players understand if Rift is losing tracking & how to avoid.❑ Assist VIVE players with umbilicus - don't let them trip themselves!❑ Use Daydream with camera cables and TV or computer to see what they see	Equipment <ul style="list-style-type: none">❑ Assist with removal of<ul style="list-style-type: none">❑ controller(s)❑ headset❑ Headphones❑ Ensure players have time to transition to real world.<ul style="list-style-type: none">❑ Warn them it may happen so they are not freaked out if it does.❑ Describe simsick symptoms, advise drink water, fresh air, eschew screens for a bit

Checklist before brownbox testing (Playtesting VR: Brownboxing, Spycams, and Fuzzy Rugs, z.d.)

Evaluation

- The benefitis of Brownboxing VR:
- Flexible staffing & Team building
 - They can join with crafting
 - It's more refreshing than screens.
 - Thinking about what your player can reach for.
 - Defines affordances
 - Spheres of interaction
 - Explore
 - capture the movement of your player
 - Make sound effects with your voice
 - Gives usable results

In short brownboxing is a rapid physical prototyping tool. It's cheap, fast to adjust and refreshing. It's import to keep in mind to set the expectations for the guest and to take care of the environment when you'll be user testing.

Research method: Persona

To have an effective target audience for my product it's neccesary to create multiple user persona's. With multiple persona's I can focus on 1 user persona instead of multiple.

While creating the persona's I used the sources: 5 User persona examples to help you create your own (Çakırca, 2022) and How to create a simple, accurate user persona in 4 steps without leaving your desk (Wagner, 2022).

- Who are they?
What is their main goal?
What is their main barrier to achieving this goal?

1. What are you using cooking for right now?
2. What kind of meals are you cooking right now?
3. What is your profession?
4. How many hours do you spend in the kitchen daily?
5. What are your biggest struggles whilst cooking?

Interview plan

Hi what is your living status?

Are you a student?

Do you cook? Why? When?

What kinds of meals do you cook?

How many hours do you spend in the kitchen daily?

What are your biggest strugglest while cooking?



Photo by George Dolgikh on Pexels.

Andrea

Student

Age 17 - 30

About

Andera is a student at a university and is living in the student dorms. Most of the time she cooks for herself but when friends are coming over she cooks a little bit more. She want’s something easy and healthy!

- Goals
- Become a chef which can cook healthy and for a lot of people.
 - Doesn't want to throw away a lot of stuff. She wants to recycle it.

Needs

- Doesn’t want to spend a lot of time in the kitchen.
- Wants to eat healthy and delicious.

Pain Points

- Healthy food is very expensive
- Cooking delicious recipe’s takes a lot of time to learn and it is very expensive
- Throws away too much food.
- For shopping she doesn’t have a lot of time to look through flyer’s for discounts.

Passionate	Curious
Empathetic	Adventurous
Favorite Cooks	
James Oliver	

Interviews

Name: Sabrina

Age: 25

Occupation: Student

Hi what is your living status?

Thuis wonend

Are you a student?

Yes

Do you cook? Why? When?

Ze bakt graag, omdat het leuk en lekker is, ze heeft een studie erin gedaan, Als ik gestresst ben bak ik of als ik zin heb in iets lekkers en ik heb het niks in huis. 9/10 geen zin om boodschappen te doen, altijd thuis standaard bak dingen staan, dan kiest ze zelf altijd thuis en ze zijn warm en vers.

What kinds of meals do you cook?

cakes, cookies, banket, taart

How many hours do you spend in the kitchen daily?

half hour to one hour.

What are your biggest strugglest while cooking?

sommige recepten weet ik uit mijn hoofd, vaak is mijn recept ergens in mijn keuken 9/10 keer wordt die vies of nat of op mijn telefoon staan, als ik met mijn vieze vingers op mijn telefoon zit dat werkt ook niet fijn. Wij hebben kleine keuken dus we hebben niet veel ruimte om laptop neer te zetten om voornamelijk recepten te bekijken.

Insights:

- Small kitchens
- No space for a recipe book
- Hard to follow recipe’s while cooking because of dirty hands.

Name: Demi

Age: 22

Occupation: Student

Hi what is your living status?

Thuis wonend

Are you a student?

Yes

Do you cook? Why? When?

Sometimes, Because mom can't cook, Mostly on Tuesdays or Saturdays but Saturday I cook for myself and Tuesday for the whole fam.

What kinds of meals do you cook?

Pasta, salades, especially a lot of pasta meals. Sometimes veggie, Avg'tjes.

How many hours do you spend in the kitchen if u are cooking?

half hour to a hour, mostly one hour.

What are your biggest strugglest while cooking?

cutting, hate it. Why? Cuz it's hard I can't handle knives very well it takes a long time especially cutting it to short pieces. Saturday thinking about recipes, I am struggling to think about recipes to cook.

Why do you have struggles, I don't have a lot of experience so I don't know a lot.

Online recipes: I use it a lot for baking but it doesn't work most of the times, most of the times I don't like the results. Sometimes you have american recipes like you have to calculate from ounce to grams and that doesn't go well most of the time.

Insights:

- Small kitchens
- No space for a recipe book
- Hard to follow recipe's while cooking because of dirty hands.

Name: Eva

Age: 23

Occupation: Student

Hi what is your living status?

Thuis wonend

Are you a student?

Yes

Do you cook? Why? When?

Vroeger meer nu af en toe. Het komt door mijn pols.

What kinds of meals do you cook?

Bakken, taarten, brood

How many hours do you spend in the kitchen if u are cooking?

half hour to a hour, mostly one hour.

What are your biggest strugglest while cooking?

Pols, als ik ga bakken, heb je soms moeilijke dingen heb je moeilijke handelingen als je nooit gedaan hebt klinkt het heftig. Zoals brood bakken, evelop technieken idk what to do.

Tips: Wat gevaarlijk zou zijn is dat je jezelf kan snijden door de visuele elementen.

Skills doen inplaats van helemaal koken. Hee lastig, in je eentje heel lastig, verapkking zijn heel groot, subtiele hints: wat je kan doen met ingrediënten.

Insights:

- Small kitchens
- No space for a recipe book
- Hard to follow recipe's while cooking because of dirty hands.

Trend analyses

Getting started with VR UI interface design by Sam Applebee and Alex Deruette.

“You don’t need to be an expert in VR; you just need to be willing to apply your skills to a new domain”

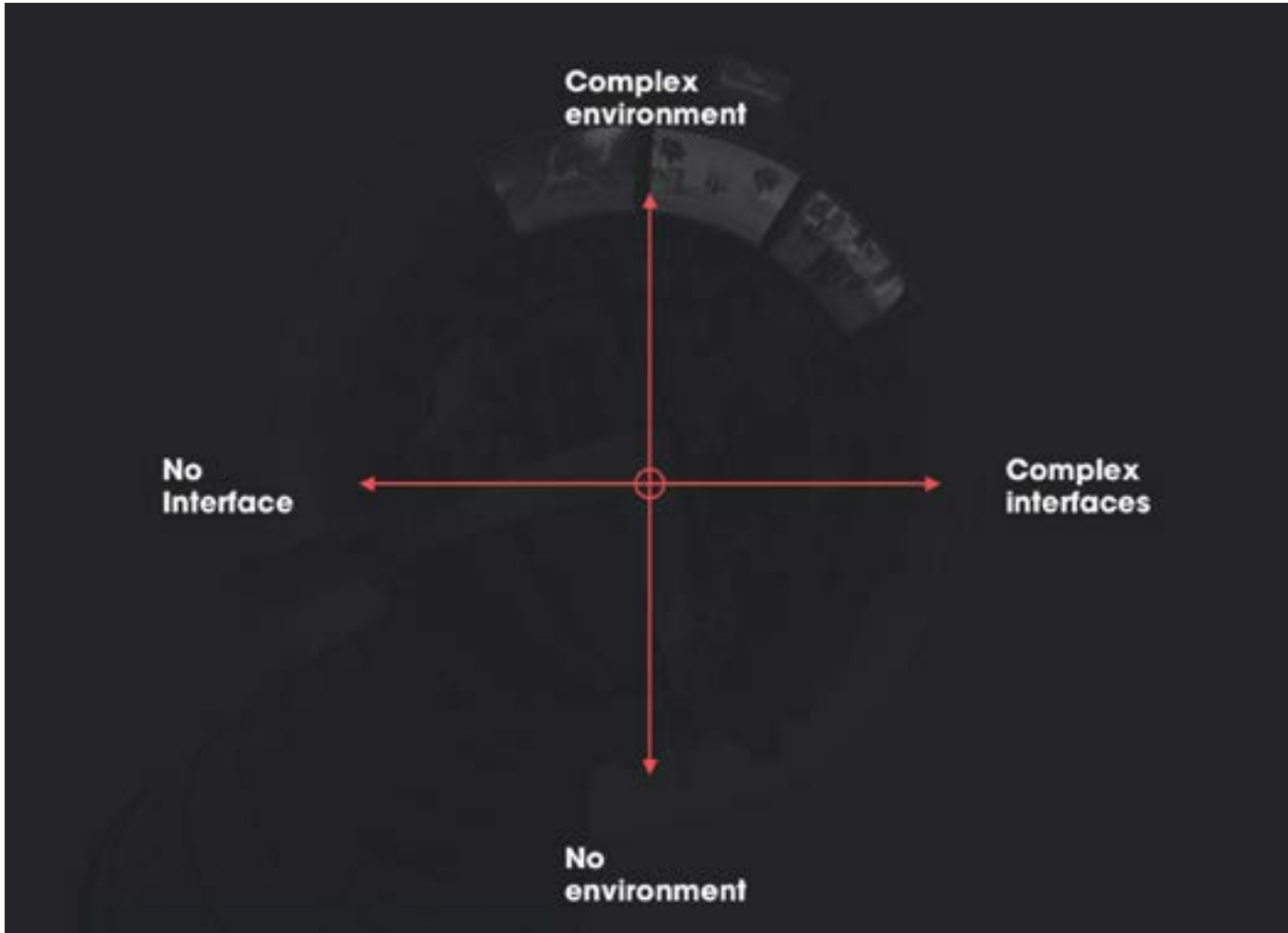
Different kinds of VR Apps:

Designer’s perspective, VR Applications are made up of two types of components:

- Environments
- Interfaces

Environments: The wold that you enter when you put in a VR Headset – the virtual planet you find yourself on, or the view from the rollercoaster that you’re riding.

Interface: Is the set of elements that users interact with to navigate an environment and control their experience. All VR apps can be positioned along two axes accoring to the complexity of these two components.



Different kinds of VR apps (Applebee, 2020)

Getting started with VR UI interface design by Sam Applebee and Alex Deruette.
“You don’t need to be an expert in VR; you just need to be willing to apply your skills to a new domain”

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Interface: Is the set of elements that users interact with to navigate an environment and control their experience. All VR apps can be positioned along two axes accoring to the complexity of these two components.

The top-left quadrant (no interface and complex environment) are things like sumlators, such as the roller coaster experience. These have a fully formed environment but no interface at all. You’re simply locked in for the ride.

The opposite quadrant are apps that have a developed interface but little or no environment. Samsung’s Gear VR home screen is a good example.



Samsung’s Gear VR home screen (Applebee, 2020)

“There’s a huge opportunity for UX and UI designers to apply their skills to designing user interfaces for VR”

A process for VR UI design

Process for designing VR interfaces are yet to be defined. When the first VR app design project came through our door, the logical first step was for us to devise a process.

“Process for designing VR Interfaces are yet to be defined.”

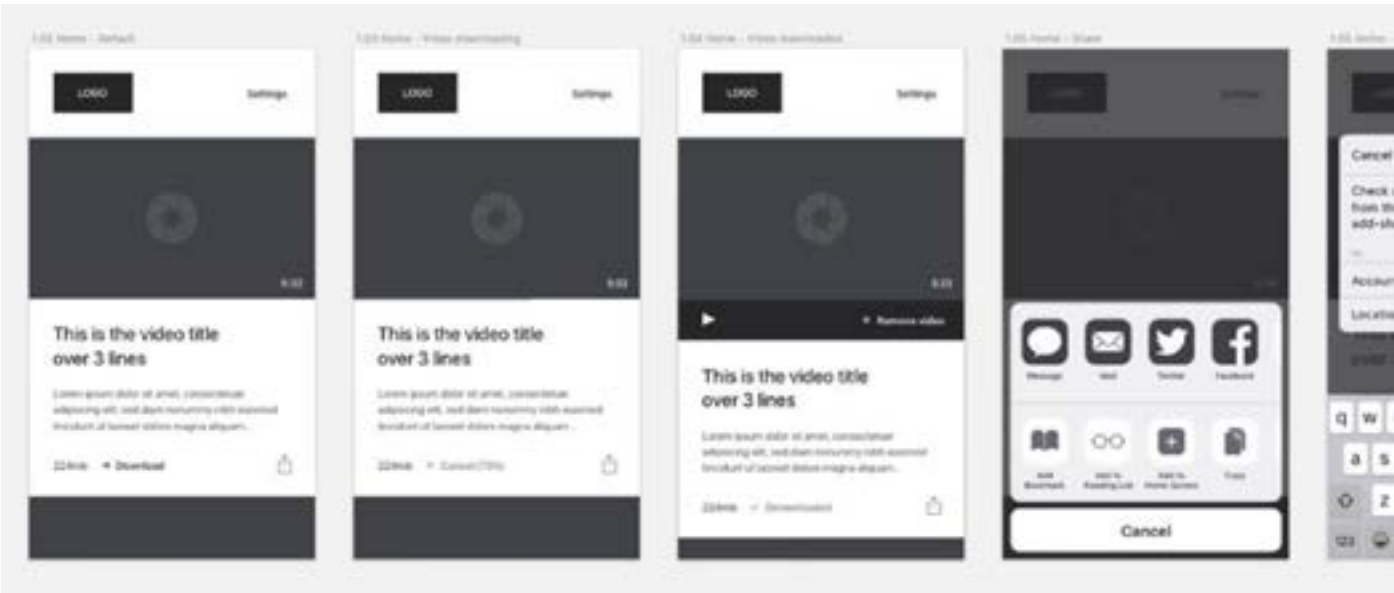
Traditional Workflows, New Territory

First interaction with Gear VR by Samsung, we noticed similarities to traditional mobile apps. Interface-based VR apps work according to the same basic dynamic as traditional apps: Users interact with an interface that helps them navigate pages. We’re simplifying here, but just keep this in mind for now.

“Workflows that designers have spent years refining won’t go to waste and can be used to craft VR UI’s”

1. Wireframes

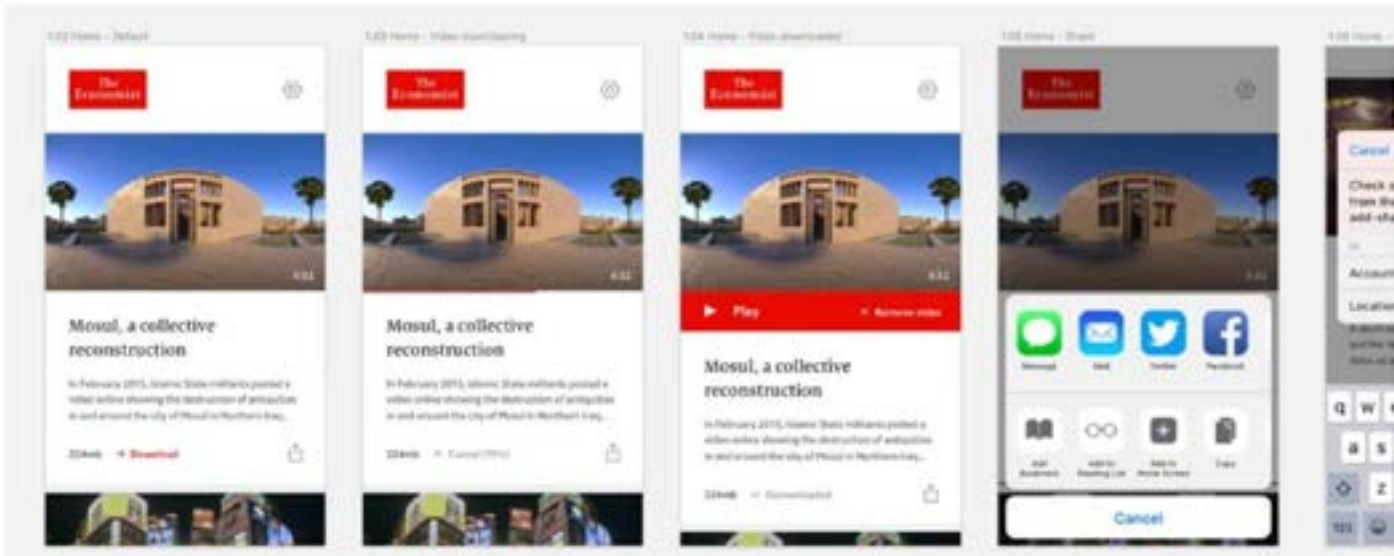
First, we’ll go through rapid iterations, defining the interactions and generald layout.



Wireframes (Applebee, 2020)

2. Visual Design

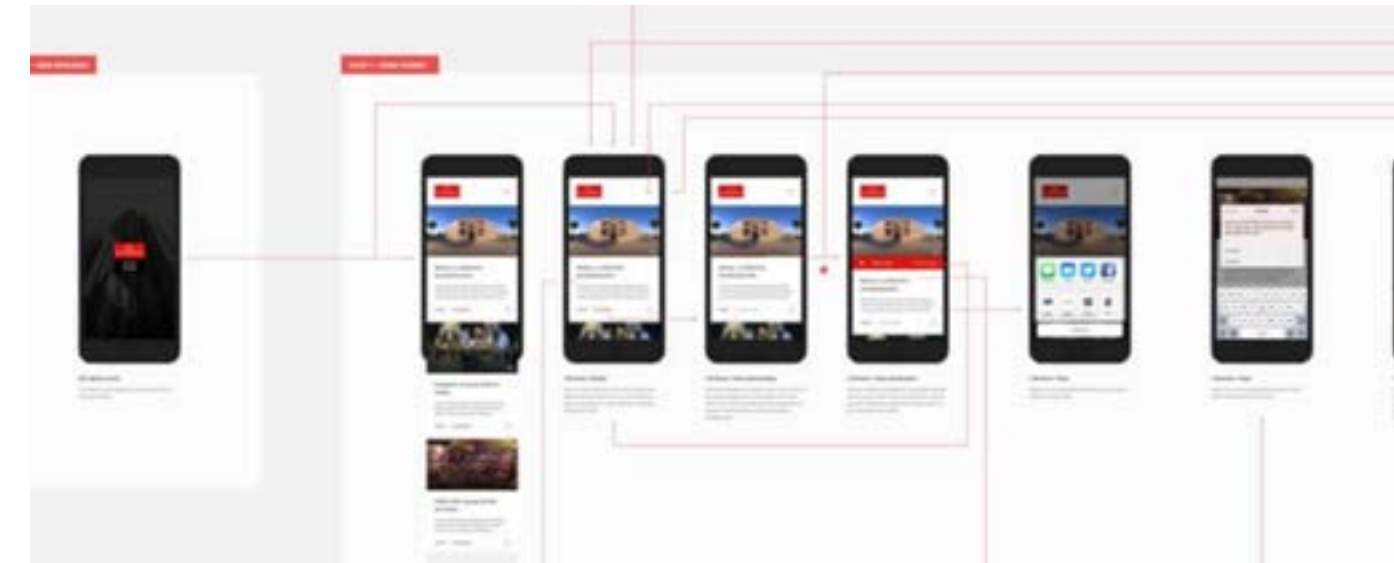
At this stage, the features and interactions have been approved. Brand guidelines are now applied to the wireframes, and a beautiful interface is crafted.



Visual Design (Applebee, 2020)

3. Blueprint

Organize screens into flows, drawing links between screens and describing the interactions for each screen.



blueprint (Applebee, 2020)

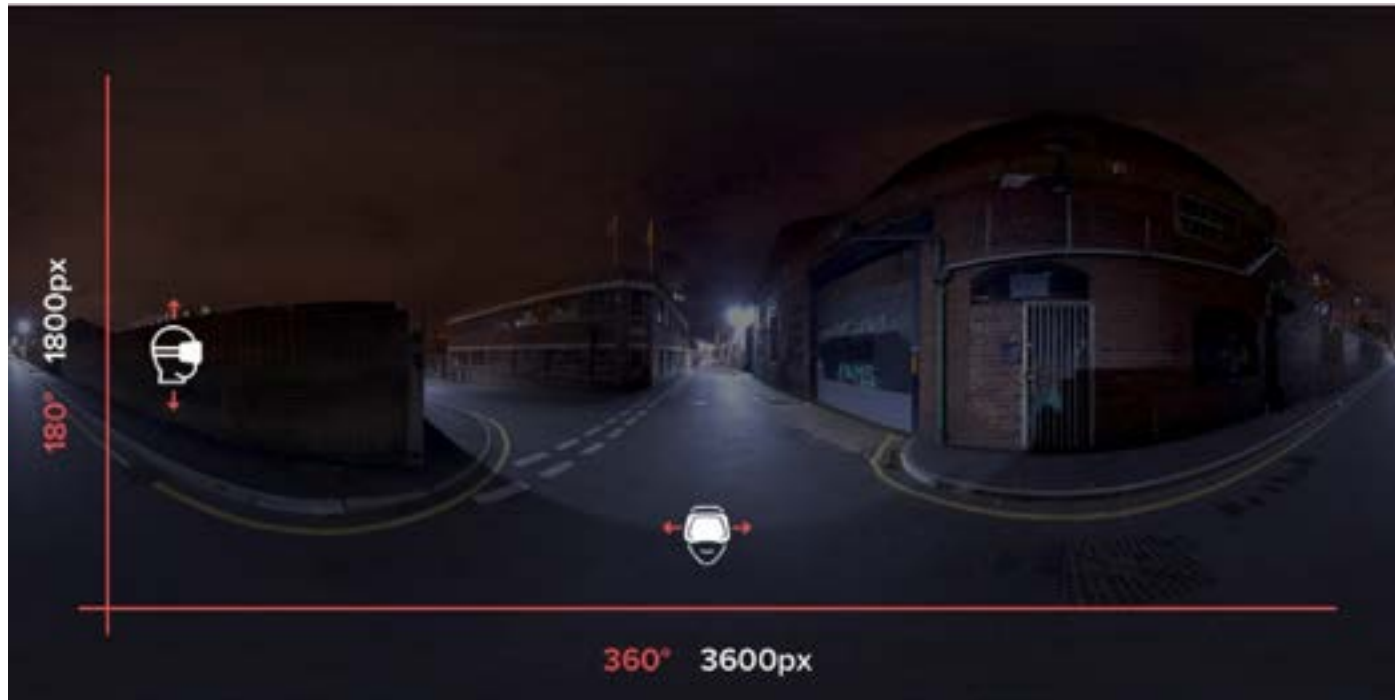
Now, how can we apply this workflow to virtual reality?

Set up

Canvas Size

Simplest problems can be the most challenging. Faces with a 360-degree canvas, one might find it difficult to know where to begin. It turns out that UX and UI designers only need to focus on a certain portion of the total space.

A flattened 360-degree environment. This representation is called an equirectangular projection. In a 3D virtual environment, these projections are wrapped around a sphere to mimic the real world.



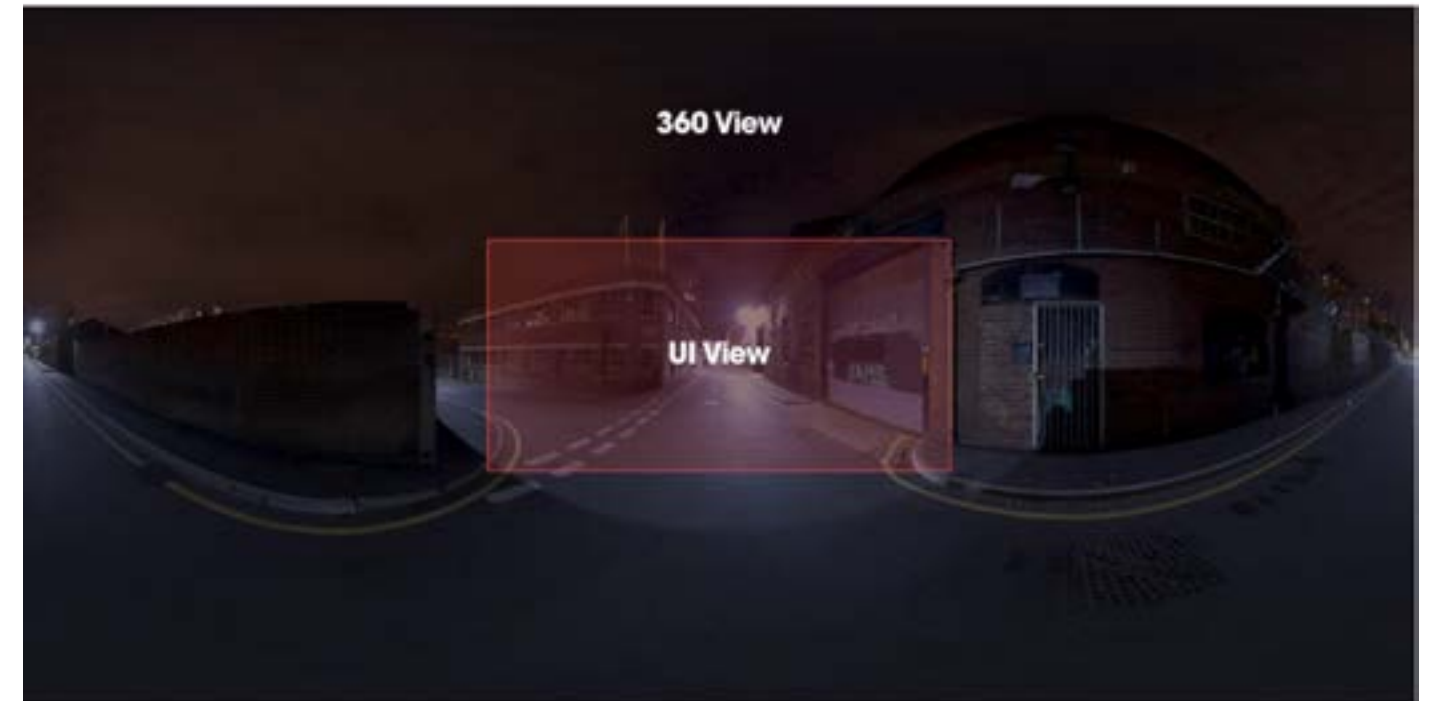
Equirectangular projection (Applebee, 2020)

The full width of the projection represents 360 degrees horizontally and 180 degrees vertically. We can use this to define the pixel size of the canvas: 3600 x 1800.

It's challenging, but we're primarily interested in the interface aspect of VR apps, we can concentrate on a segment of this canvas.

Building on Mike Alger's early research on comfortable viewing areas, we can isolate a portion where it makes sense to present the interface. (Ravensbourne University London, 2016)

The area of interest represents one ninth of the 360-degree environment. It's positioned right at the centre of the equirectangular image and is 1200 x 600 pixels in size.



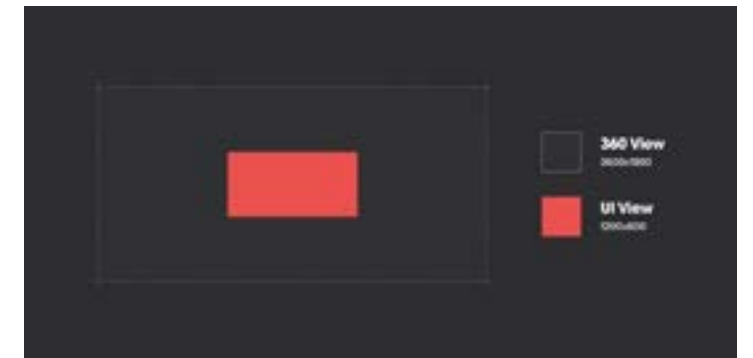
Equirectangular projection with the UI view (Applebee, 2020)

Let's sum up:

- "360 View": 3600 x 1800 pixels
- "UI View": 1200 x 600 pixels

Testing

The reason for using two canvases for a single screen is testing. The "UI View" canvas helps to keep our focus on the Interface we're crafting and makes it easier to design flows.



Comparison (Applebee, 2020)

Meanwhile, the "360 View" is used to preview the interface in a VR environment. To get a real sense of proportions, testing the interface with a VR headset is necessary.

Tools

- Sketch, for Interfaces and user flows (<https://www.sketch.com/>)
- Go pro VR player, a free 360 degree content viewer. (<http://www.kolor.com/kolor-eyes/>)
- Oculus rift, hooking oculus rift into the gopro vr player will enable us to test the design in context. (<https://www3.oculus.com/en-us/rift/>)

A process For VR Interface Design

Assets: (https://www.dropbox.com/s/i73fot0fevv436c/Kickpush_VRDemo_Assets.zip?dl=0)

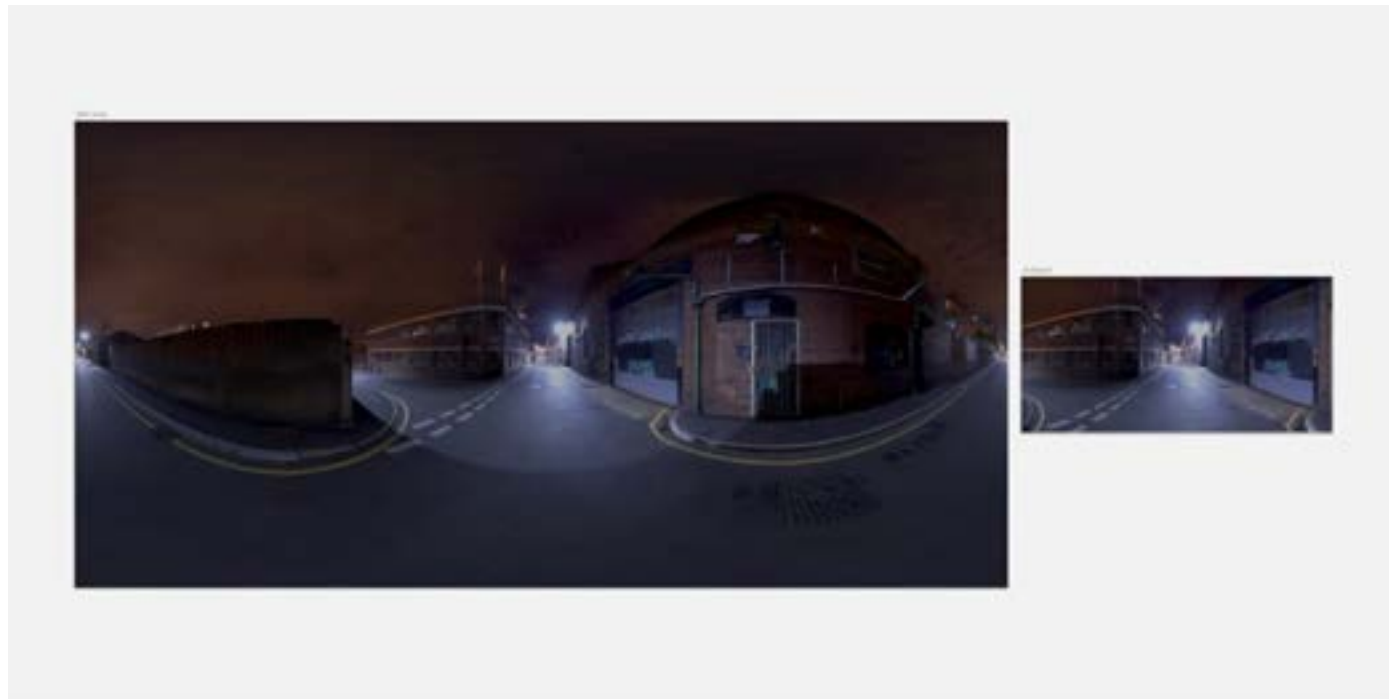
1. Set up a "360 View"

First create a canvas that will represent the 360-degree view. Open a new document in Sketch, and create an artboard: 3600 x 1800 pixels.

Import the file named background.jpg, and place it in the middle of the canvas. If you're using your own equirectangular background, make sure its proportions are 2:1, and resize it to 3600 x 1800 pixels.

2. Set Up Artboard

Create a new artboard next to the previous one: 1200 x 600 pixels. Then, copy the background that we just added to our "360 View", and place it in the middle of our new artboard. Don't resize it! We want to keep a cropped version of the background here.



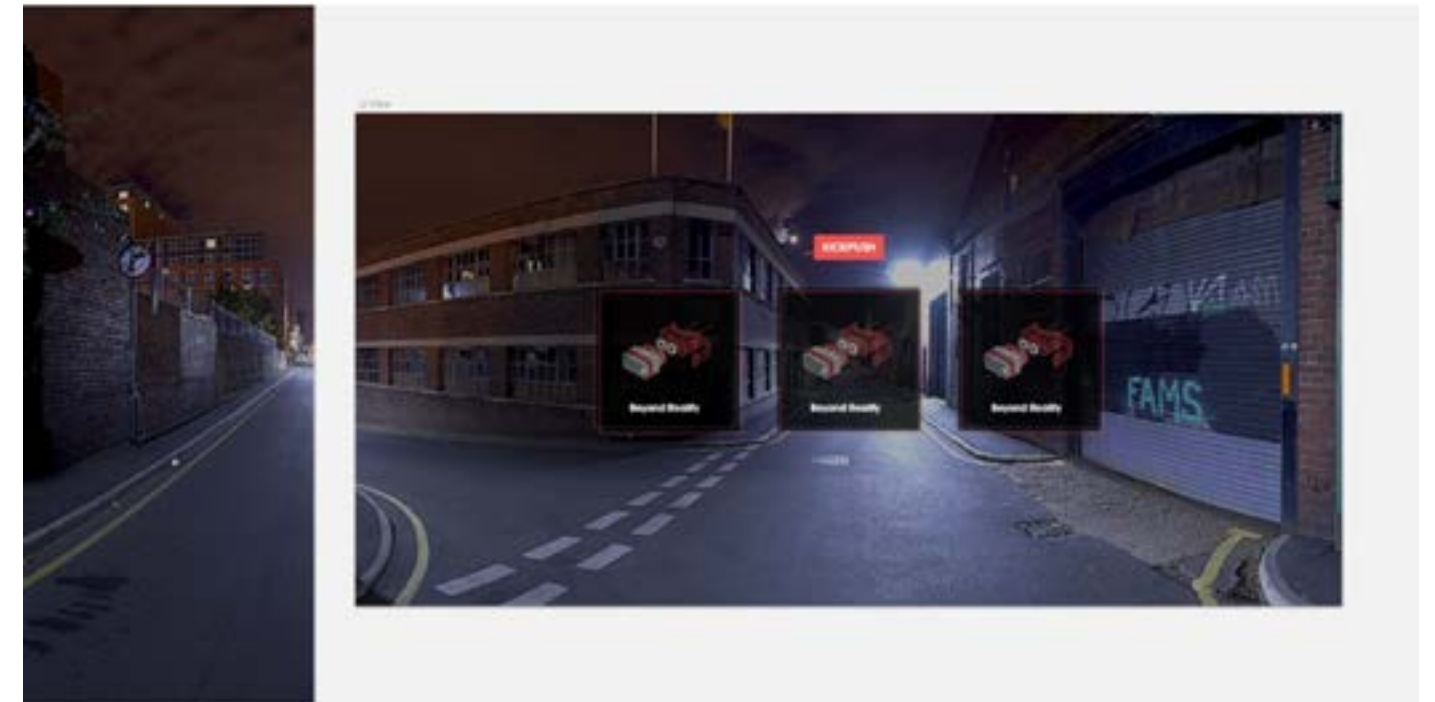
Equirectangular projection in Sketch up (Applebee, 2020)

3. Designing the Interface

We're going to design our interface on the "UI View" canvas. We'll keep things simple for the sake of this exercise and add a row of tiles. If you're feeling lazy, just grab the file named tile.png in the assets pack and drag it into the middle of the UI view.

Duplicate it, and create a row of three tiles.

Grab kickpush-logo.png from the assets pack, and place it above the tiles.



Equirectangular projection with a canvas (Applebee, 2020)

4. Merge Artboards and Export

Now for the fun stuff. Make sure the "UI View" artboard is above the "360 View" Artboard in the layers list on the left.

Drag the "UI View" artboard to the middle of the "360 View" artboard. Export the "360 View" artboard as a PNG; the "UI View" will be on top of it.

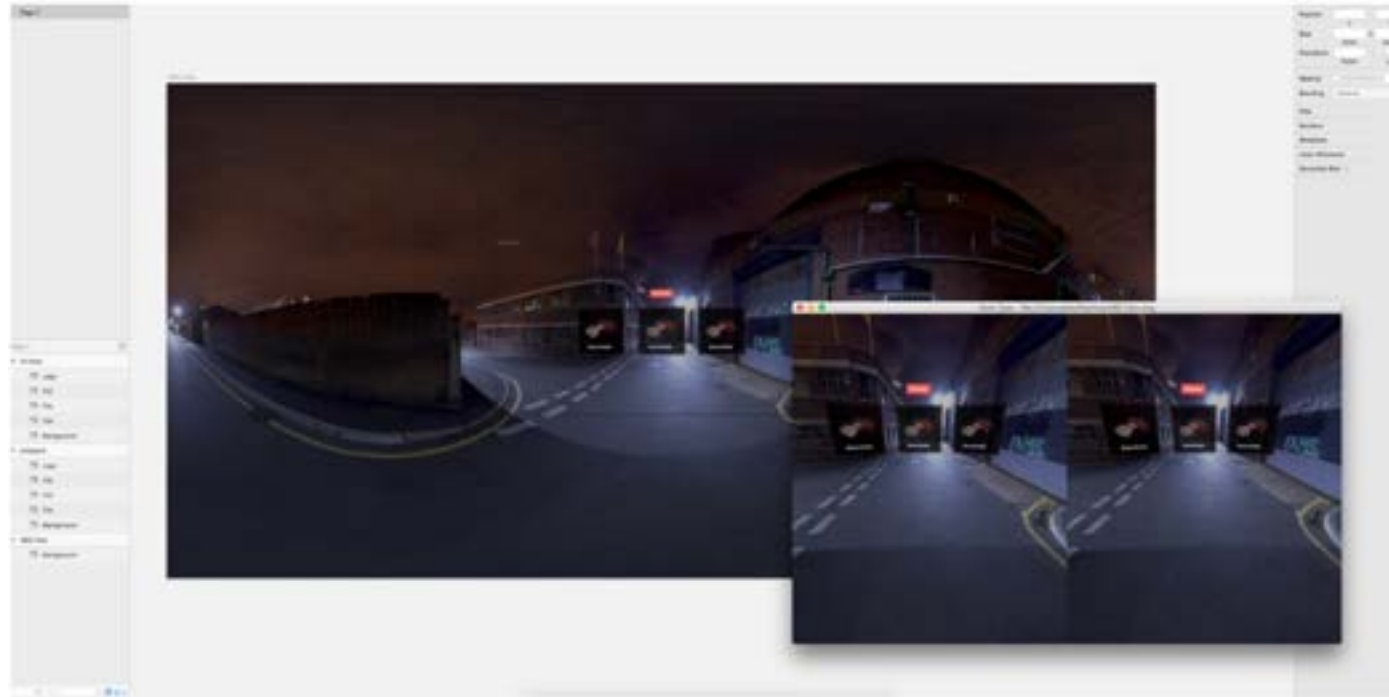


Equirectangular projection in Sketch up (Applebee, 2020)

5. Test it in VR

Open the GoPro VR player and drag the "360 View" PNG in to the window. Drag the image with your mouse to preview your 360-degree environment.

If you have an Oculus Rift set up on your machine, then the GoPro VR Player should detect it and allow you to preview the image using your VR device. Depending on your configuration, you might have to mess around with the display settings in MacOS.



Equirectangular projection in GoPro VR (Applebee, 2020)

Technical Considerations

Low Resolution

Vr Headset resolution is equivalent to your phone's resolution. However considering the device is 5 centimeters from your eyes, the display doesn't look crisp.

To get a crisp VR experience, we would need an 8K display per eye. That's a 15,360 x 7680-pixel display. We're pretty far off from that, but we'll get there eventually.

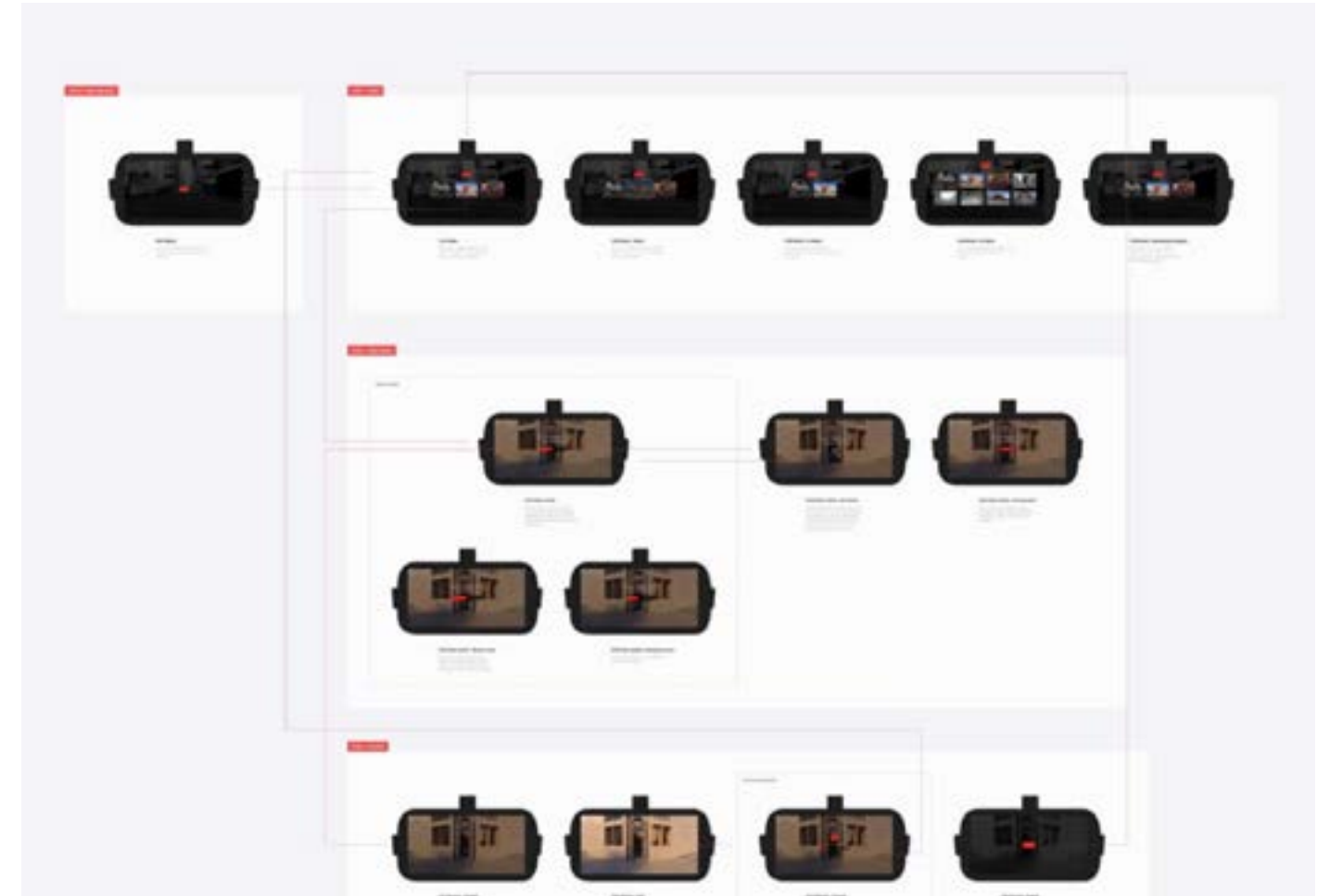
Text Readability

Because of the display's resolution, all of your beautifully crisp UI elements will look pixelated. This means, first, that text will be difficult to read and, secondly, that there will be a high level of aliasing on straight lines. Try to avoid using big text blocks and highly detailed UI elements.

Finishing Touches

Blueprint

Remember the blueprint from our mobile app design process? We've adapted this practice to VR interfaces. Using our UI views, we map and organize our flows into a comprehensible blueprint, ideal for developers to understand the overall architecture of the app we've designed.



Blueprint of equirectangular projection (Applebee, 2020)

Motion Design

"Designing beautiful UI is one thing, but showing how it's supposed to animate is a different story." Using Sketch designs, we animate the interface with After effects and principle. While the outcome is not a 3D experience, it's used as a guideline for the development team and to help our clients understand our vision at an early stage of the process.

Designing for VR: A beginners Guide

Tools and guidelines for VR development (Hudelson, 2021)

The best way to learn about VR design... is in VR

Google cardboard is a great entry point for newbies, as it is affordable (\$15) and works with any smart phone. Tilt brush and Google eart VR apps are great interactive experiences to try first.



Til Brush (Hudelson, 2021)

Think beyond the rectangle

When you're in immersive 360 space, your environment is boundless.



Oculus Home UI (Hudelson, 2021)

Sketching Ideas

Getting started designing your VR experiences isn't too different than the process for designing applications or a web or mobile product. You will need user personas, conceptual flows, wireframes, a VR prototype and a interaction model.

As you ideate on design ideas, consider some of these fundamental questions:

- How do people get started?
- What affordances are provided to guide people without overwhelming them?
- Do you want to err on the side of providing too much guidance or create a minimalist environment that doesn't overload the user with too many choices?

Don't expect people to know what to do and where to go. Slow and progressive familiarization, visual clues, and guidance from the software should all be used to help the user.

Don't Reinvent UI Patterns

VR apps with intuitive user interfaces -- similar to what people use on their wearables, phones, tablets and computers - are what will make VR accessible to the masses. Novel interactions are fun to come up with, but it increases user's learning curve.

Similar to designing 2D interfaces, VR designers should use size, contrast and color to denote hierarchy. In VR, size is based on the distance between the user and a piece of content, so it's important to understand the scale of content and appropriate viewing distance. For example, knowing how large to design your type is tricky, but fortunately there are many precedents in the real world. The same considerations made for print design (billboards, posters, books) are helpful when designing content for VR.



Billboard; Samsung Gear Home UI (Hudelson, 2021)

Consider how we interact with a touchscreen monitor today. There are a number of patterns that we have all grown up to understand such as swiping, pinching to zoom, and long tapping to bring up more options. These are all considerations that should be made in VR as well.

Tools

Pencil and Paper

Before diving into software, get your ideas on paper. It's fast, cheap, and helps you express ideas that may take hours in software. This is especially important because moving from sketches to hi-fidelity can cost much more in 3D than in 2D.

Software

If you are building a 3D game, you'll want to use Unity or Unreal Engine. Cinema 4D and Maya are also widely used, but mostly for complex animations and renderings.

Framworks

Three mayjor frameworks to choose from when designing for VR: Mozilla A-frame, Daydream VR, and Unity VR/Unreal SDK.

1. Mozilla A-frame is for Web VR and can be used platforms such as Google cardboard, Samsung Gear, and Oculus Rift.
2. Daydream VR is for midrange VR and works with mobile phones only.
3. Unity VR/Unreal SDK are for high end headsets including Oculus Rift, HTC Vive, and HoloLens (AR).

Experience Principles

When designing for VR, you're designing for the capabilities of people as much as you're designing for the capabilities of the system. It's essential that you understand your users and the issues that may come up while they experience VR.

" Virtual Reality is the ultimate empathy machine. These experiences are more than documentaries. They're opportunities to walk a mile in someone else's shoes."

- Chris Milk

Physiological Comfort

Desigining an experience that is comfortable for people is the most important consideration (and a difficult one). If you've ever used a VR headset for more than 20 minutes, you've likely experienced some sort of fatigue or nausea. VR can confuse your brain because your body is stationary but you're viewing an environment that is moving. Providing a fixed reference point, such as a horizon line or a dashboard that stays with you as you move, helps ease nausea. If there is much movement in your app -- accelerating, zooming, jumping-- it must be controlled by the user or they will become sick.

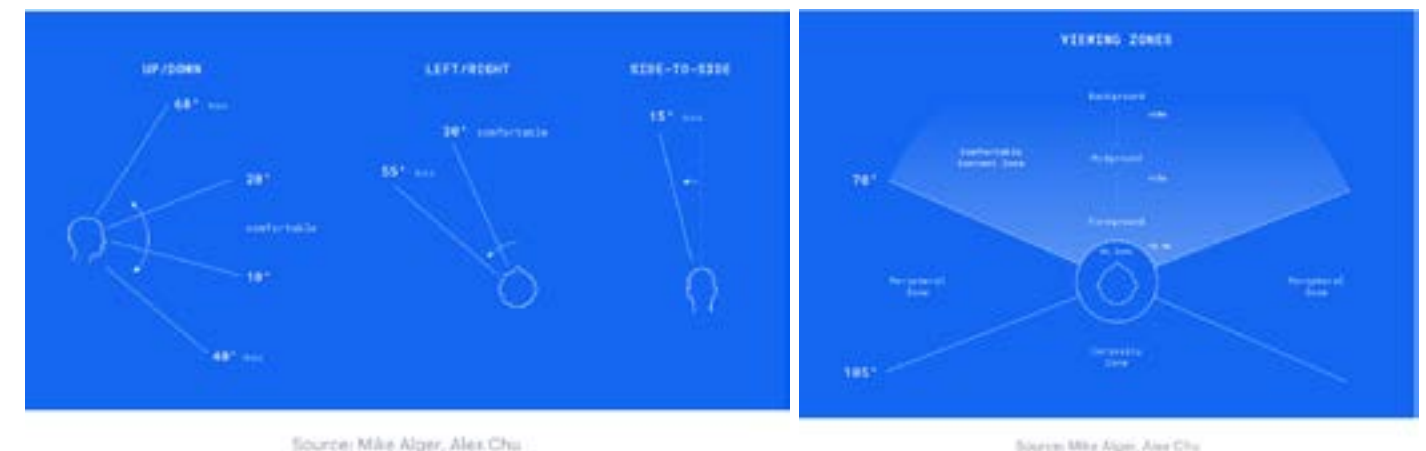
Environmental Comfort

People can easily get uncomfortable in small, large or high spaces (claustrophobia/agoraphobia/vertigo), so it's important to understand scale as a VR designer. If you design a space that's too big, users may get lost. If a space is too small, users may get claustrophobic.

There are many ways to guide people through your virtual environment. Non-spatial methods including audio and light can be especially useful. Audio can be used for spatial positioning and light can be used to reveal a path to follow. The gaming industry has used these techniques for years to help guide people through their journeys.

Ergonomics

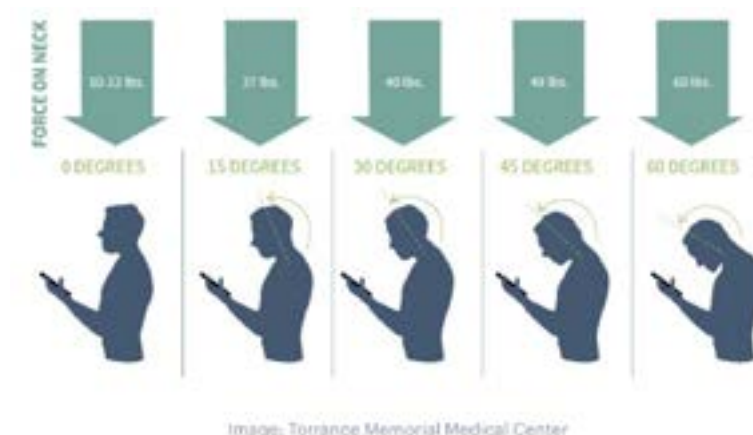
When first designing for VR it's exciting to think about creating futuristic interfaces like we've seen from Hollywood blockbusters like Iron Man or Minority Report, but the reality is those UIs would be exhausting if used for more than a few minutes. The following diagrams help to illustrate the comfortable range of motion zones:



Comfortable range of motion zones (Hudelson, 2021)

We've been all affected by some sort of "text neck" syndrome at some point.

Depending on how far you lean over, poor posture can create up to 60 pounds of pressure on your spine. This can lead to permanent nerve damage in your spine and neck.



VR is adopted by a wider audience, it will be essential to establish healthy habits and movements standards. Instead of trying to adapt ourselves to fit the limited interactions supported by our existing technologies, our interactions with VR platforms will need to be as natural and intuitive as possible. This “natural computing” paradigm -- that is, interactions that no longer have to adapt to be limited form factors of the computer (keyboard, mouse, touchscreen) -- will allow us to interact with the digital world in the same way we interact with the physical world.

Input methods

When you’re wearing a VR headset, you can’t see what is in your hands. Unlike gaming controllers that we’ve grown accustomed to (Playstation, Xbox, Wii), Vr hand controllers have to be suitable for “blind mode” use.

Sound

While sound is often annoying when using the web or mobile apps, it is a integral part of VR development. Consider the phenomenon of synesthesia, where stimulation of one sense leads to the automatic triggering of another sense. For example, you smell something and get the illusion of taste. This also works with sound. Since tactile feedback is still lacking in VR, sound is a great way to provide feedback when users touch objects.

3D Sound — aka Holophonic sound — is still in its infancy, but will be transformative in how we experience VR. We are all used to stereophonic sound, which provides sound coming from two channels (left/right), but holophonic sound allows us to tell if sound is coming from above, below, or behind us. Think of when you are outside and hear an airplane. You intuitively look up, right? Having this sound experience in VR is what will make it truly immersive.

VR Design Guidelines

In closing, I recommend checking out a few resources that will give you a broader understanding of how to design for VR. Google VR Guidelines, Oculus VR Best Practices, and the UX of VR are the best places to start. After reading through these resources, you’ll easily be ahead of the crowd.

Design Practices in Virtual Reality

By Jonathan Ravasz

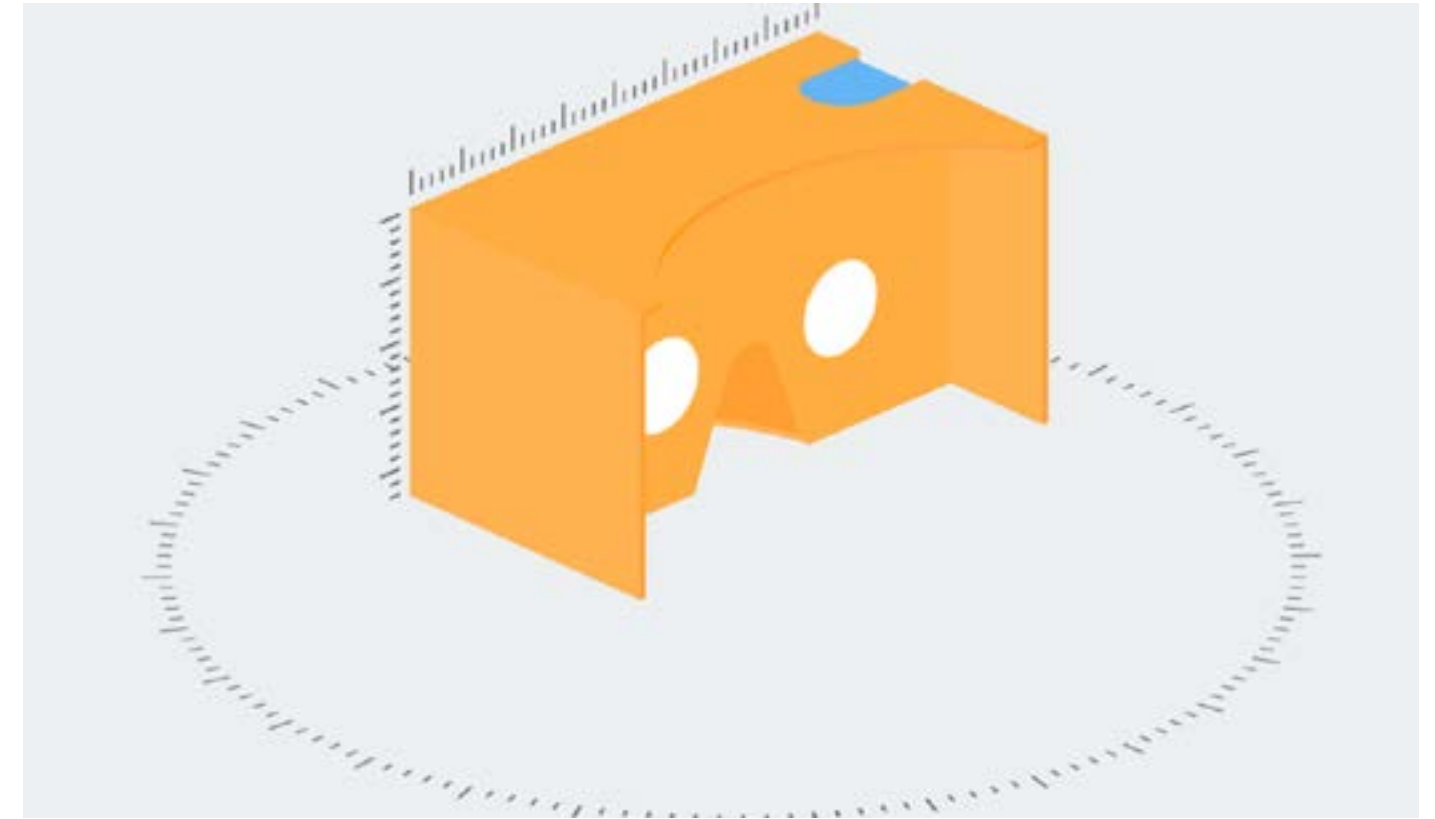


image source by (Ravasz, 2020)

“Designing for VR should not mean transferring 2D practices to 3D, but finding a new paradigm.”

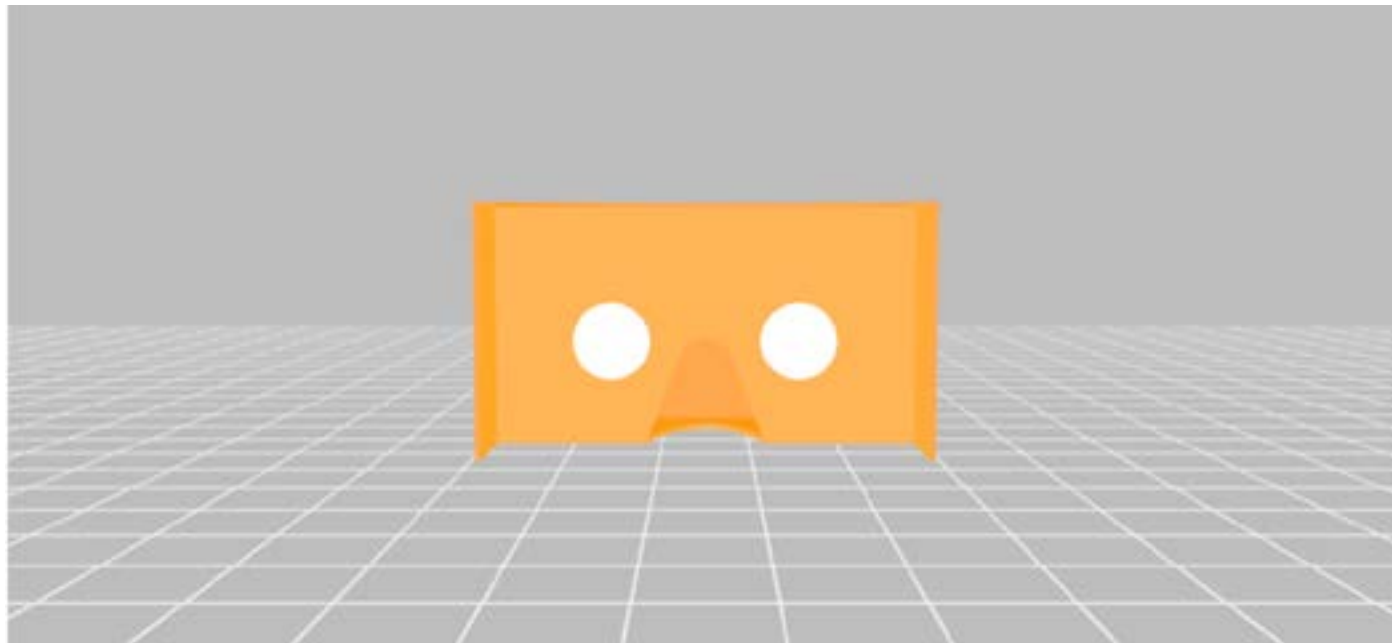
The foundation of this research is based on the literature exploring human perception and environment, such as The Ecological approach to Visual Perception by James J. Gibson, Inquiry by Design by John Zeisel or The poetics of Space by Gatson Bachelard. Although the core literature of environmental psychology was written in the 70’s, the knowledge is entirely applicable to virtual reality.

“The future of this medium depends on the content created for it.”

Design Solutions for VR

Role of the ground

“When a pilot is in the clouds there is nothing to see outside the plane, and it can be very disorienting. When the pilot comes out of the clouds and sees the ground and sky meeting at the horizon, the pilot can orient” (James J. Gibson, 2015, p. 19). Users can find themselves in such situation in poorly designed VR experiences, causing inevitable motion sickness. The ground to horizon relationship is as important in VR as in our physical reality.



Importance, Role of the ground (Ravasz, 2020)

Atmosphere

Atmosphere (aerial) perspective can help users to understand the scale of the virtual environment, therefore making the experience more natural. The concept of this phenomenon is simple: "The farther away an object is, the more air and particles we have to look through, making object that are farther away look less sharp and bluer than close objects" (E. Bruce Goldstein, 2013, p. 230). This gradual fading of the landscape is a clear cue for depth and distance.



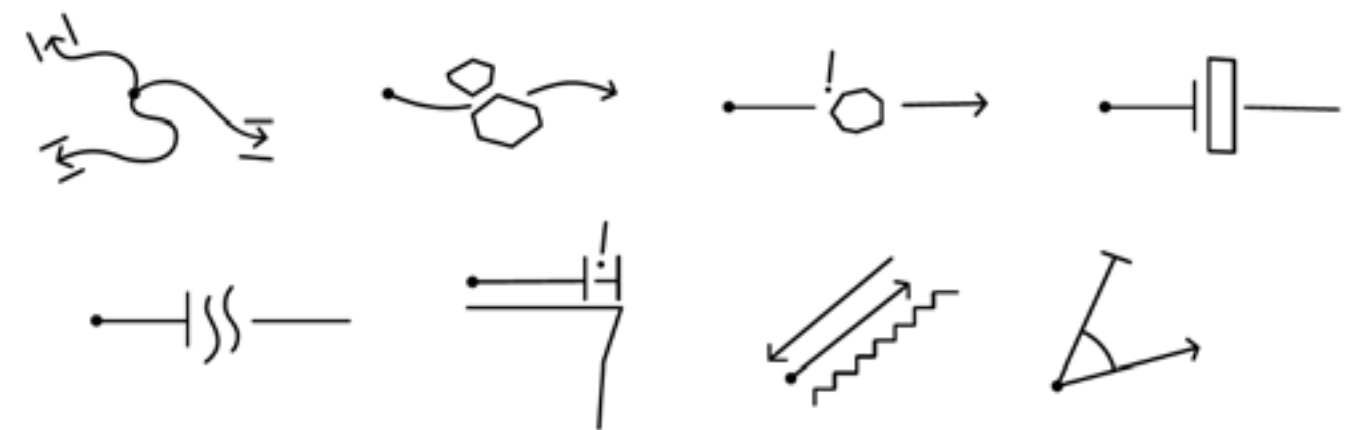
Masaccio using atmospheric perspective in order to create the illusion of depth.

Image by (Ravasz, 2020)

Terrain features

James J. Gibson in his book *The Ecological Approach to Visual Perception* (p.62) breaks down terrain features into 8 main categories.

- Ground is rarely an open environment. It is usually cluttered. Open environments allow locomotion to any directions over the ground, whereas a cluttered environment allows locomotion only at openings.
- A path affords pedestrian motion from one place to another, between other terrain features.
- An obstacle is an animal-sized object that affords collision.
- Barrier is a specific kind of obstacle that is usually blocking vision as well as movement.
- A water margin prevents pedestrian locomotion.
- A brink, the edge of a cliff. The limit of approach. It is danger zone, pedestrian animals avoid these places.
- A step is a layout of adjacent steps which afford both descent or ascent.
- A slope may or may not afford pedestrian locomotion dependent on the angle and texture of the ground.



Terrain features: opening, path, obstacle, barrier, water margin, brink, step and slope. (Ravasz, 2020)

Using these features in a controlled manner, as the building blocks when designing the virtual environment, will result in (natural) VR experiences guided by human intuition.

Introducing environments through soundscapes

Sudden changes to the entire environment causes sickness and confusion. A gentle introduction of the new environment can be achieved by fading-in the ambient soundscape of the place at first, then the image. This allows to build a mental image of the environment via sound, lowering the shock factor.

Guiding the user with objects

Navigating users in a cluttered environment can be difficult without using conventional wayfinding UI elements. The usage of these elements could break the immersion of the experience. However subtle changes in the environment, such as growing flowers at the openings of a field in order to draw the users attention to the correct path (Parkin, 2016), could still maintain the genuineness of the place. These hints should be contextual the flowers would not work in certain landscapes.



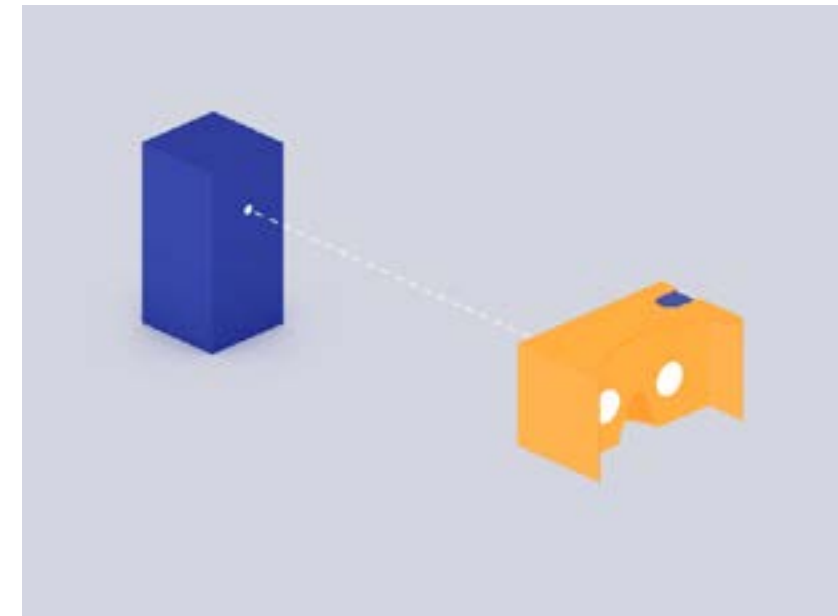
Red flowers in Firewatch guiding the player towards the correct direction (Parkin, 2016).

Contextual reticle

In non-tracked VR (e.g. Gear VR, Google Cardboard), reticles are used in order to show the user the specific point where they gaze¹. It helps to orient in space by showing the centre of focus. It is also used for movement and interacting with objects. These specific tasks demand different reactions from the reticle.

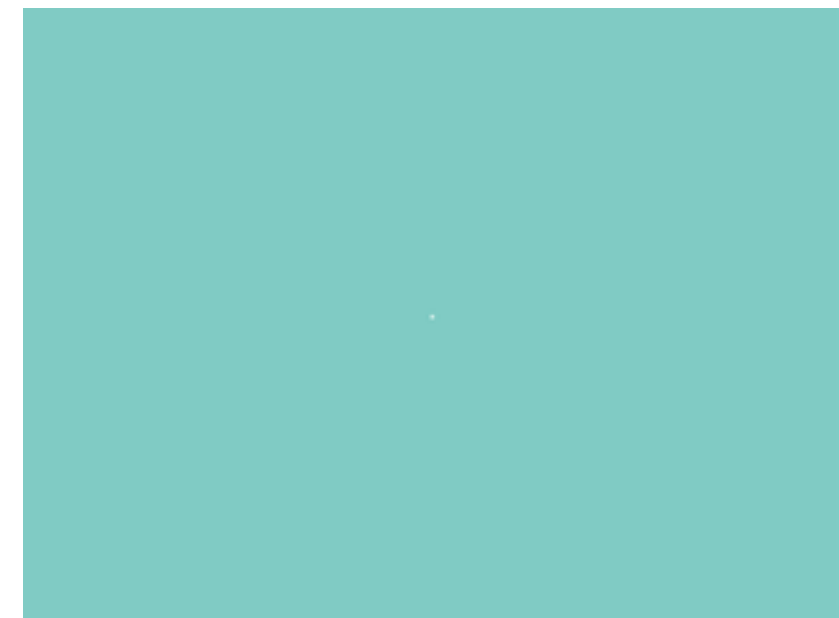
- Idle state- The idle state reticle should be as minimal as possible, only hinting where the centre is.

- Movement -the reticle should be activated when the user looks at any place that is approachable. When doing so, the reticle should transform into a larger pointer, highlighting the selectable area with a circle projected over it from the user's perspective.



Gif- Difference between idle state and movement reticles (Ravasz, 2020)

- Interacting with objects -when the user turns his/her attention to an interactive object the reticle should react accordingly.

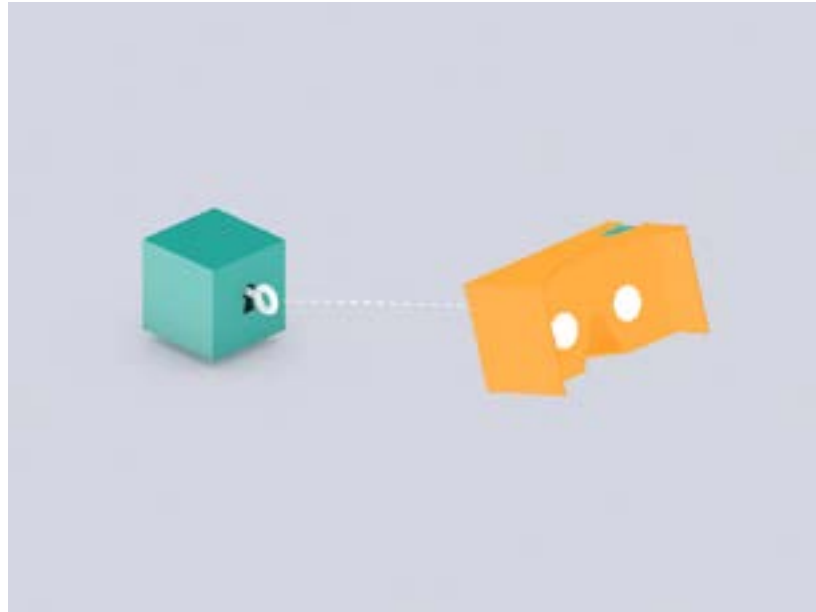


Gif- Transition between idle state and interactive reticles (Ravasz, 2020)

- Reticle colouring -the reticle should adapt its colour to the brightness level of its background, by switching between light and dark modes in order to stay visible in all lighting conditions.

¹ <https://www.google.com/design/spec-vr/interactive-patterns/display-reticle.html>

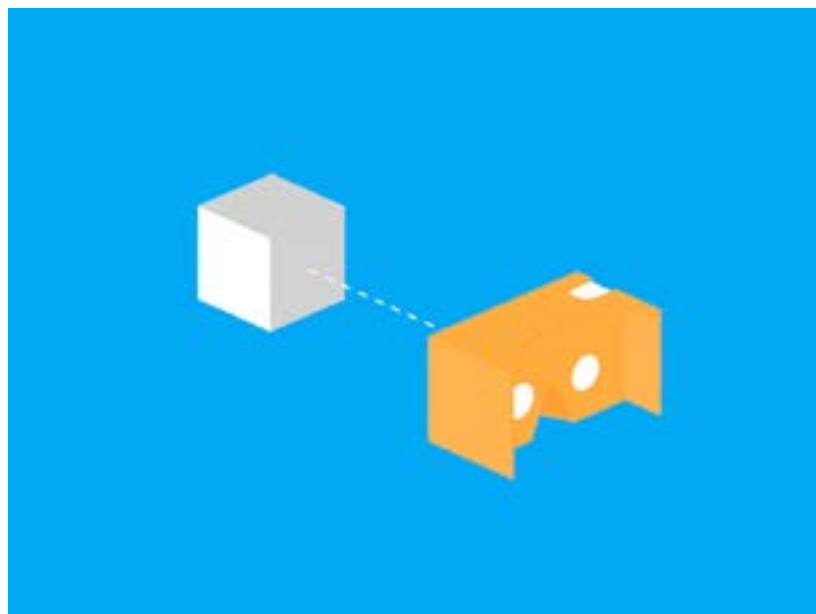
- Objects are reticle - replacing the reticle with specific 3D items can be an easy cue for the interaction (e.g. a key as the reticle whilst opening a lock).



GIF - 3D item replacing reticle for a specific interaction (Ravasz, 2020)

Contextual recticle

Users should be hinted which objects they can interact with. The contextual reticle can be a help in this case, but in some cases, in order to avoid confusion, the interactive objects should change, too. This could be a minor change in the shading of the object or a subtle sound describing its behaviour whilst looking at it (e.g. subtle click in case of light switches).



GIF- Interactive object activated on look (Ravasz, 2020)

Conclusion

Virtual Reality is emerging as a new medium with the potential of having as strong an impact as radio or television did in the past century. We have the opportunity to build the foundations of interface, experience and interaction design specific for this medium without taking already existing solutions for granted. (Ravasz, 2020)

Virtual Reality Ui's Games Testing:

I Expect You to Die

Bekijk mijn gameplay: <https://youtu.be/SkTeZmobGMQ>

Notes: Tijdens IEYTD zit je op 1 vaste plek je kan makkelijk de VR ervaring mee maken door telekinetische krachten. Dit maakt de ervaring wel minder realistisch maar wel snel en goed. Tijdens het spelen kon ik moeilijk zien wat je wel of niet kon vast pakken of hoe bepaalde stappen moesten. De stem die je help komt realistisch over door middel van een walkie talkie. Alleen de muziek na het voltooien van een "goeie" taak vind ik niet realistisch. Vervolgens is het veel uit zoeken en experimenteren met de objecten waarmee je kan interacteren. Leuke puzzel game doet me denken aan een escape room. Wat me wel opviel was dat tijdens het spel zelf je geen instructies krijgt of hulp naast een indicator wat aangeeft wat je kan pakken en een stem die je instructies geeft.



Solving a mission with telekinesis.
(I Expect You To Die | I Expect You To Die | Schell Games, z.d.)



Canvas after you died.
(I Expect You To Die | I Expect You To Die | Schell Games, z.d.)

Car Mechanic Simulator

Bekijk mijn gameplay: <https://youtu.be/KdmoHqPxf7o>

Car mechanic is een leerzame ervaring waarbij je een auto leert monteren. In het begin krijg je wel heel veel instructies wat heel erg onoverzichtelijk kan zijn. Je heb namelijk een dia presentatie met je stappen, een tablet die je kan spawnen waar ook allerlei instructies opstaan en tot slot instructies van de game zelf over de gebruik van de knoppen. Dus je wordt overlaade met informatie in het begin.

Tijdens deze ervaring kan je kiezen tussen de verschillende soorten locomotion wat heel fijn is! De tutorial is heel duidelijk en leert de gebruiker echt de hoofd interacties met de auto en de gereedschap ervan.

Tevens heeft de game een goeie manier van objecten highlighten waarmee interactie plaats kan vinden.



Gebruiksvriendelijke keuze bepaling
(Red Dot Games : Game Development Studio | Car Mechanic Simulator 2021, z.d.)



Knopjes kunnen ingedrukt worden.
(Red Dot Games : Game Development Studio | Car Mechanic Simulator 2021, z.d.)



Objecten met interactie hebben een highlight
(Red Dot Games : Game Development Studio | Car Mechanic Simulator 2021, z.d.)

Untill You Fall

Bekijk mijn gameplay: <https://youtu.be/E3WNL2UvLwQ>

Notes: Untill you fall is een arcade game stijl medieval hack en slash game. Het doel is om zoveel mogelijk monsters te verslaan en niet dood te gaan. Aan het einde van een level kan je voor een upgradge kiezen die je personage sterker maakt.

Vignetting wordt gebruikt om te helpen tegen motion sickness in VR, als good default bevelen ze de vigenetting power aan op maximalen kracht.



De vignetting wordt voornamelijk gebruikt voor tijdens het bewegen.
(Until You Fall | Until You Fall | Schell Games, z.d.)



De Canvas wordt gebruikt om te laten zien hoe de game werkt.
(Until You Fall | Until You Fall | Schell Games, z.d.)

Tutorials for interaction in VR

Valem Tutorials op Youtube

Biedt een groot aanbod aan Virtual Reality Tutorials in Unity.

How to make a VR Game in Unity 2022 - Part 7 User Interface

<https://www.youtube.com/watch?v=yhB921bDLYA&t=40s>

Tutorial van Unity

Creating a VR Menu

[https://learn.unity.com/tutorial/creating-a-vr-menu-2019-](https://learn.unity.com/tutorial/creating-a-vr-menu-2019-2#6036dc27edbc2a50f848a701)

[2#6036dc27edbc2a50f848a701](https://learn.unity.com/tutorial/creating-a-vr-menu-2019-2#6036dc27edbc2a50f848a701)

VR with Andrew

[01] [Unity] Menu System for VR

[https://www.youtube.com/watch?v=__iTtJHZg6k&ab_](https://www.youtube.com/watch?v=__iTtJHZg6k&ab_channel=VRwithAndrew)

[channel=VRwithAndrew](https://www.youtube.com/watch?v=__iTtJHZg6k&ab_channel=VRwithAndrew)

Kwaliteitscheck - Onderzoek

Peer review Vragen:

Begrijp je de reden waarom ik dit heb onderzocht?

Vind je dat dit onderzoek bij mijn project past?

Heb je nog op/aanmerkingen?

Feedback van Yara:

- Persona en het visuele hiërarchie mag duidelijker

- Grote kopjes zijn te dun

- De reden van dit onderzoek is vooraf onderzoek, het was voor mij niet duidelijk waarom je dit gedaan hebt. Geef het in het begin ergens aan wat je hiermee probeert te bereiken.

- Informatie zou zeker bij je project passen, uiteindelijk ligt het aan de uitwerking zelf.

- In het begin duidelijker verwoorden!

Conclusion research

In conclusion, the research findings highlight valuable insights and best practices from the examined sources in designing and developing VR experiences.

Utilizing virtual reality in cooking provides an immersive experience with realistic simulations and a diverse range of ingredients.

Niantic's Design Pattern Search equips developers with proven design patterns and solutions for AR development, enhancing their efficiency. The concept of brown-boxing in VR playtesting enables faster iterations and improved test outcomes. The use of personas in design contributes to a better understanding of the target audience and the creation of user-friendly VR interfaces. The VR development guide offers valuable insights and guidelines, while the examined game interfaces provide practical insights for game testing.

By incorporating this knowledge and utilizing the provided tools, designers can create immersive, comfortable, and user-centric VR experiences.

Sketch: Brownboxing happy flow

In brownboxing I am researching if people understand the visual clue's. The visual clue's I am user testing are:

- Cutting lines
- Placement for fingers
- Go back and Go forward

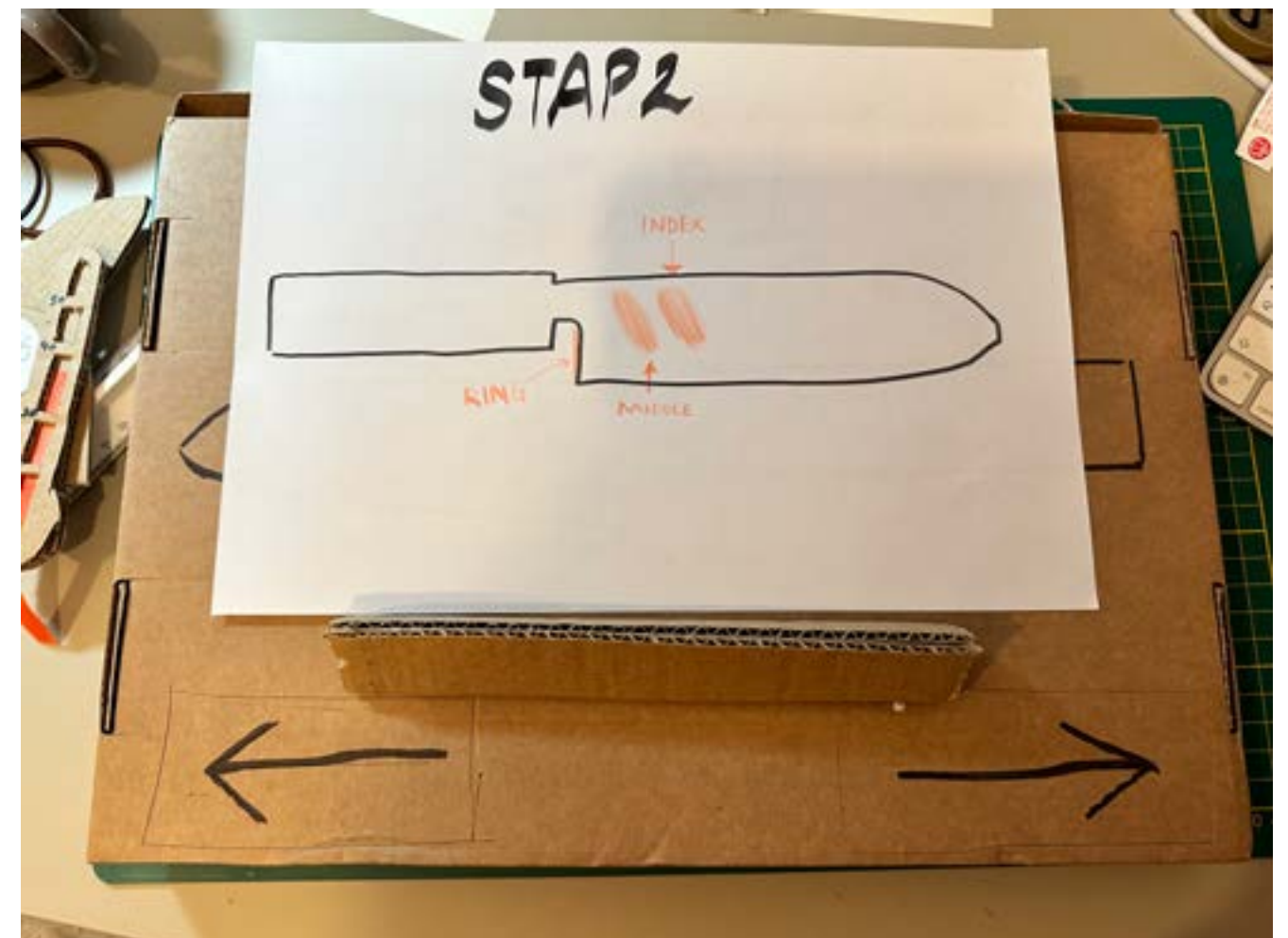
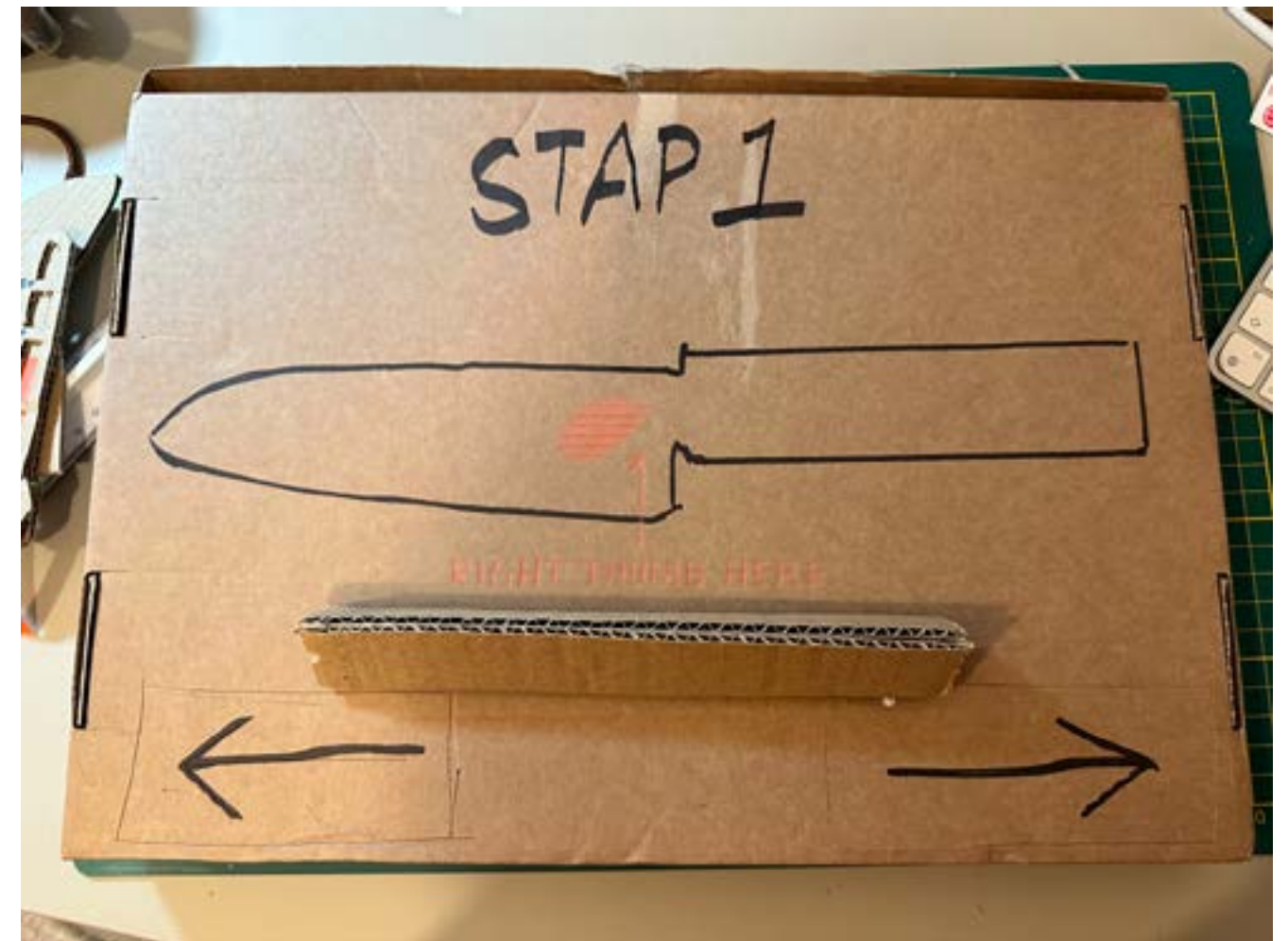
The user test:

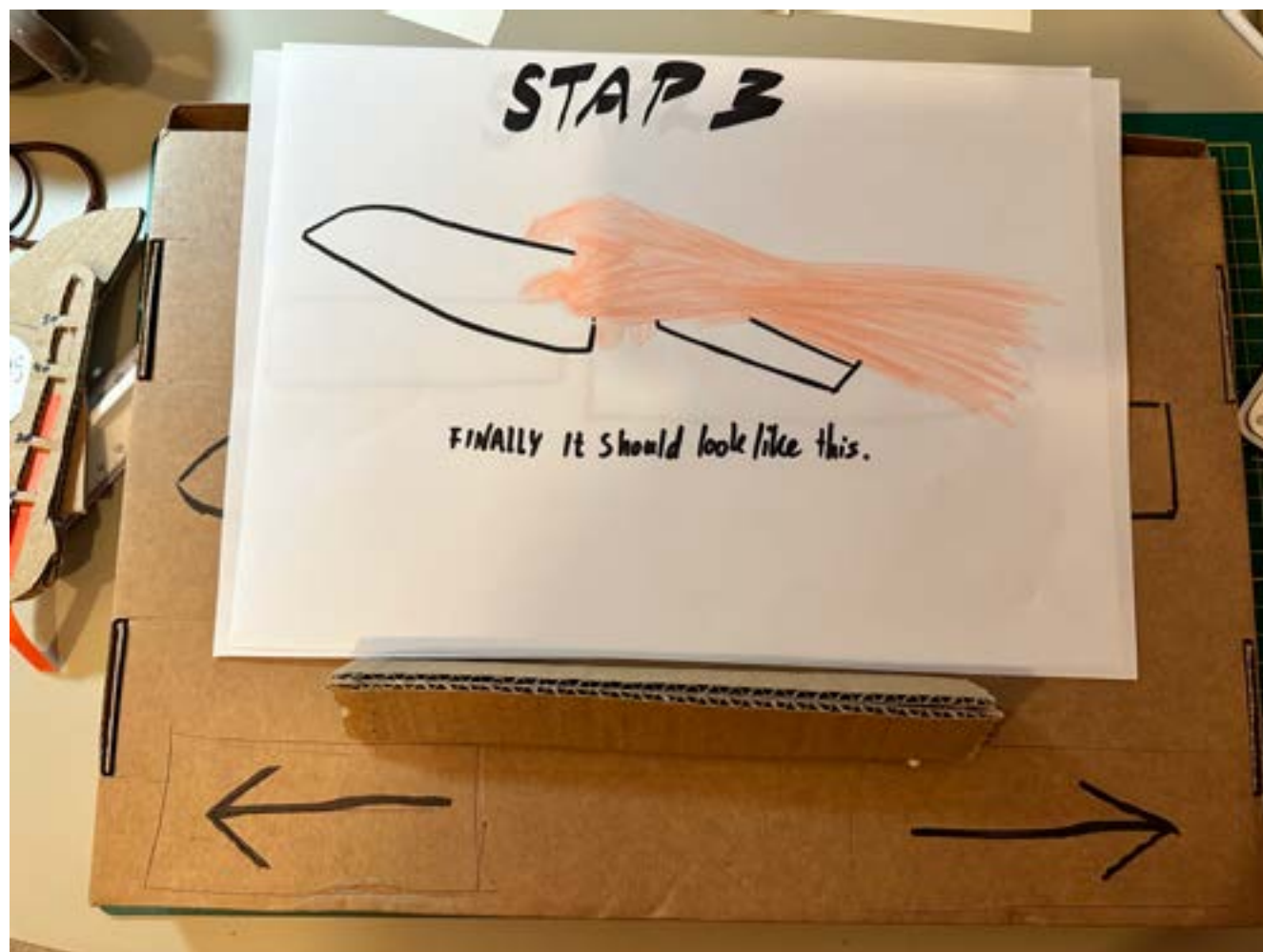
There are 4 items in front of the tester. A knife, a thermometer, a timer and a fish. With those items the tester should complete tasks/instructions.

1. First task: Does the user knows what is happening?
2. Second task: Prepare the dish
3. Third task: Does the user knows how to hold a knife ?
4. Fourth task: Is it clear for the user how to filet a fish?

After the tasks there are some interview questions for the user, the questions:

1. What do you think of the overall experience?
2. What are things that you dislike about this?
3. What are things that you like about this?
4. What are things that can improve the experience?



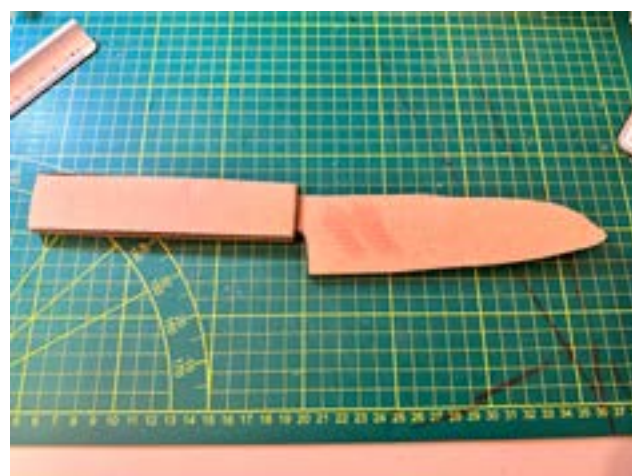


Tester 1: Demi

1. First task: Does the user know what is happening?
yes it is very clear
2. Second task: Prepare the dish
succes
3. Third task: Does the user know how to hold a knife ?
Yes
4. Fourth task: Is it clear for the user how to filet a fish?
Yes

After the tasks there are some interview questions for the user, the questions:

1. What do you think of the overall experience?
Very clear
2. What are things that you dislike about this?
Nothing
3. What are things that you like about this?
Instructions on the cardbox
4. What are things that can improve the experience?
too short make it bigger



MAKING THE PROTOTYPE WITH UNITY



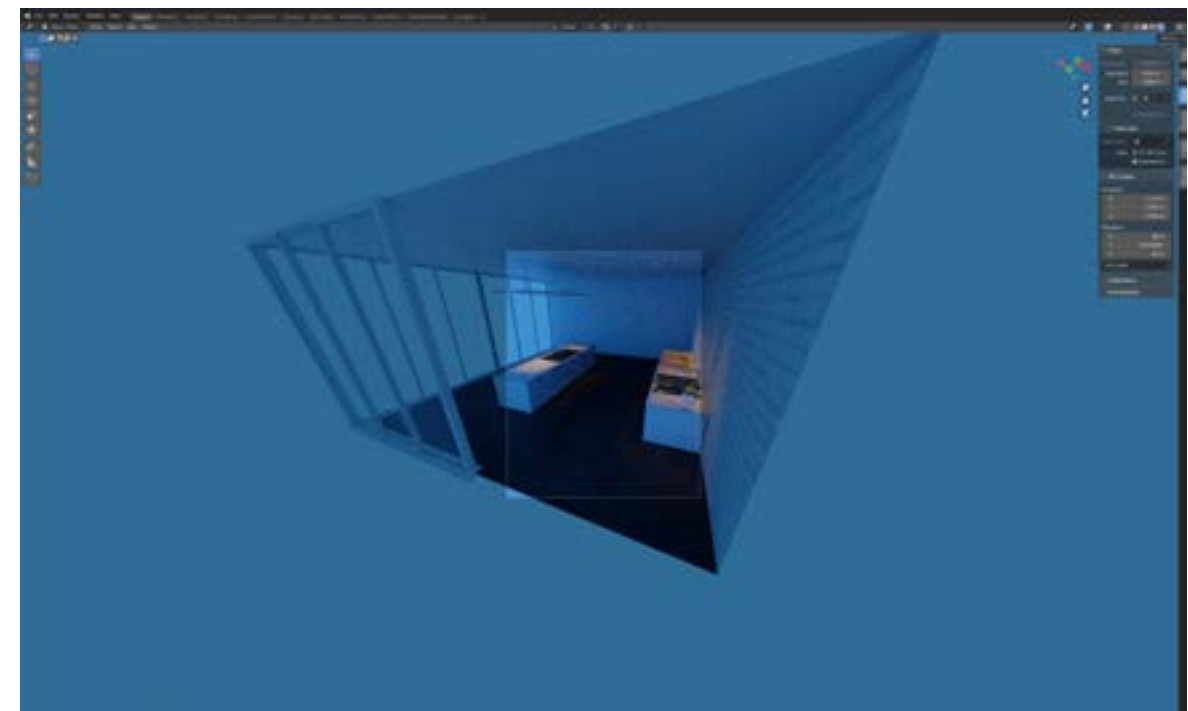
Na 6 juni 2023

Project iteratie 1.0 - verder in het oude project

Nadat ik terug was gekomen van Zweden ben gaan werken aan het prototype. Ik wist totaal niet waar ik aan moest beginnen aangezien ik weinig unity ervaring heb en C# niet ken. Ik ben wezen kijken online naar tutorials.

Mijn plan was om met Blender een keuken na te maken en vervolgens in unity interacties eraan toe te voegen. Het is deels gelukt om een keuken te bouwen in blender maar uiteindelijk is het niet goed verlopen omdat ik niet weet hoe ik aan de losse onderdelen interacties moest vastzetten.

Daarnaast heb ik een cursus aangeschaft en voltooid wat gaat over hoe ik blender object naar Unity kan exporteren.




Keuken ontworpen in Blender om vervolgens de interacties te testen.
(Blender Guru, 2019) heeft mij laten zien hoe ik een keuken kan bouwen in blender.

Ik wilde vervolgens door werken in mijn unity project van Extended Reality maar al snel liep ik vast omdat ik gewoon niet weet wat ik aan het doen ben in unity, ik volg youtube tutorials maar al snel blijkt dat ik het alleen volg en niet veel leert.

Project iteratie 2.0 - Nieuw Unity Project

Ik ben vervolgens gaan vragen aan chatGPT waar ik een cursus unity kan volgen en daaruit blijkt dat Unity zelf cursussen geeft over unity.

Choose the right Pathway for you




Unity Essentials

2 weeks • Foundational +600 XP

New to Unity? This guided learning Pathway includes everything you need to get started.

[Unity Essentials Pathway](#)




Junior Programmer

12 weeks • Foundational +3000 XP

Ready to code? This guided learning Pathway will take you from zero to job-ready!

[Junior Programmer Pathway](#)




Creative Core

10 weeks • Beginner +3000 XP

Ready for more? Level up your core understanding of Unity with the creative aspects of the engine.

[Creative Core Pathway](#)




VR Development

6 weeks • Beginner +600 XP

Ready to develop for VR? This guided learning Pathway will prepare you for a job in the VR industry!

[VR Development Pathway](#)



Mobile AR Development

8 weeks • Foundational +600 XP

Ready to create AR experiences? In this learning pathway, you'll develop AR apps compatible with iOS and Android devices!

[Mobile AR Development Pathway](#)

(Learn game development w/ Unity | Courses & tutorials in game design, VR, AR, & Real-time 3D | Unity Learn, z.d.)

De cursussen zijn van hoge kwaliteit, leuk om te doen en leerzaam. Ik wilde beginnen met VR Development ookal staat er dat het voor beginners is de requisitie is dat de student de junior programmer pathway voltooid moest hebben.

Junior Programmer Pathway Unity

Create with code

Ik heb geleerd om 3D games te coderen en te positioneren/ registeren in unity. De eerste cursus bedraagt een tijd van 15 uur en 45 minuten.

Een uitgebreide documentatie van alle skills kunt u terug vinden in de bijlage. De Unity skills document.

Prototype 1

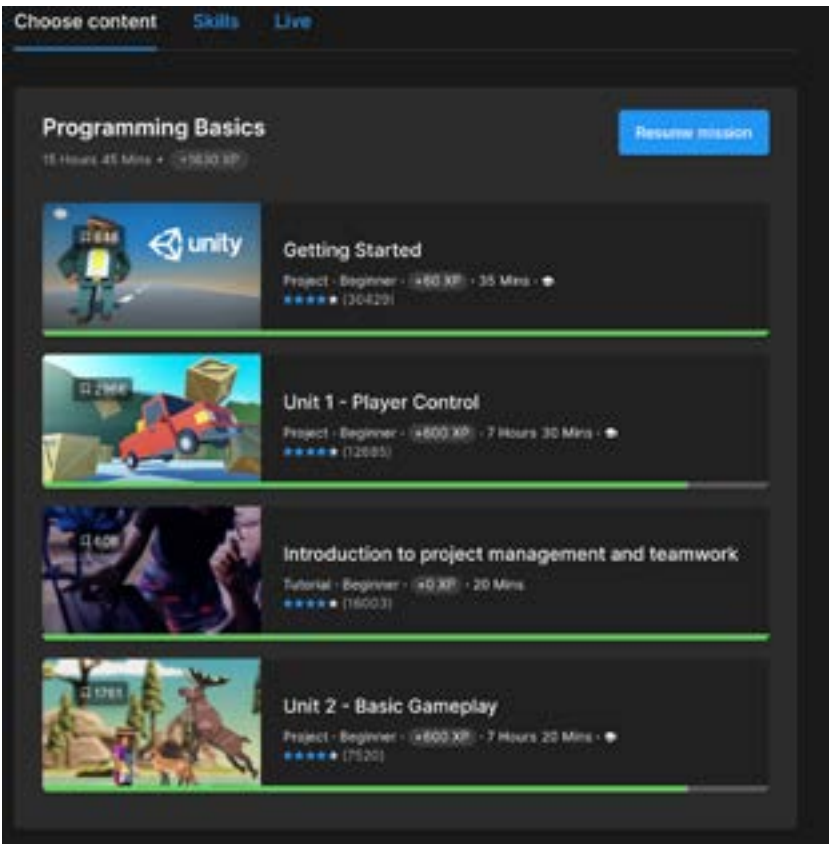
Player Control

De games die ik heb gemaakt zijn ook te spelen op de browser. Ik heb ze geëxporteerd als WebGL! Prototype 1: <https://play.unity.com/mg/other/webgl-builds-357539>

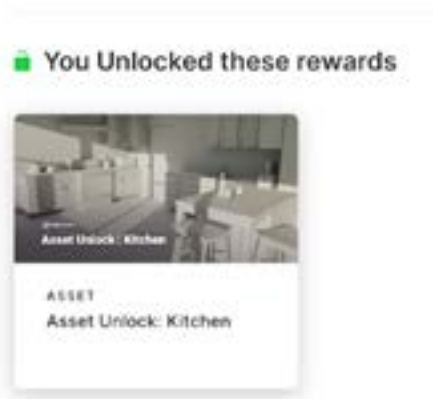
Prototype 2

Basic Gameplay

Prototype 2: <https://play.unity.com/mg/other/prototype-2-challenge-5>



(Junior Programmer: Create with Code 1 - Unity Learn, z.d.)



Na het voltooien van de eerste kwart van de cursus heb ik een asset gekregen van Unity een keuken! (Junior Programmer: Create with Code 1 - Unity Learn, z.d.)

Programming Simple Functionality

Ik heb geleerd om 3D games te coderen en te positioneren/ registeren in unity.
De tweede cursus bedraagt een tijd van 27 uur en 15 minuten.

Prototype 3

Sound and Effects

De games die ik heb gemaakt zijn ook te spelen op de browser.

Prototype 3:
<https://play.unity.com/mg/other/builds-xz-9>

Prototype 4

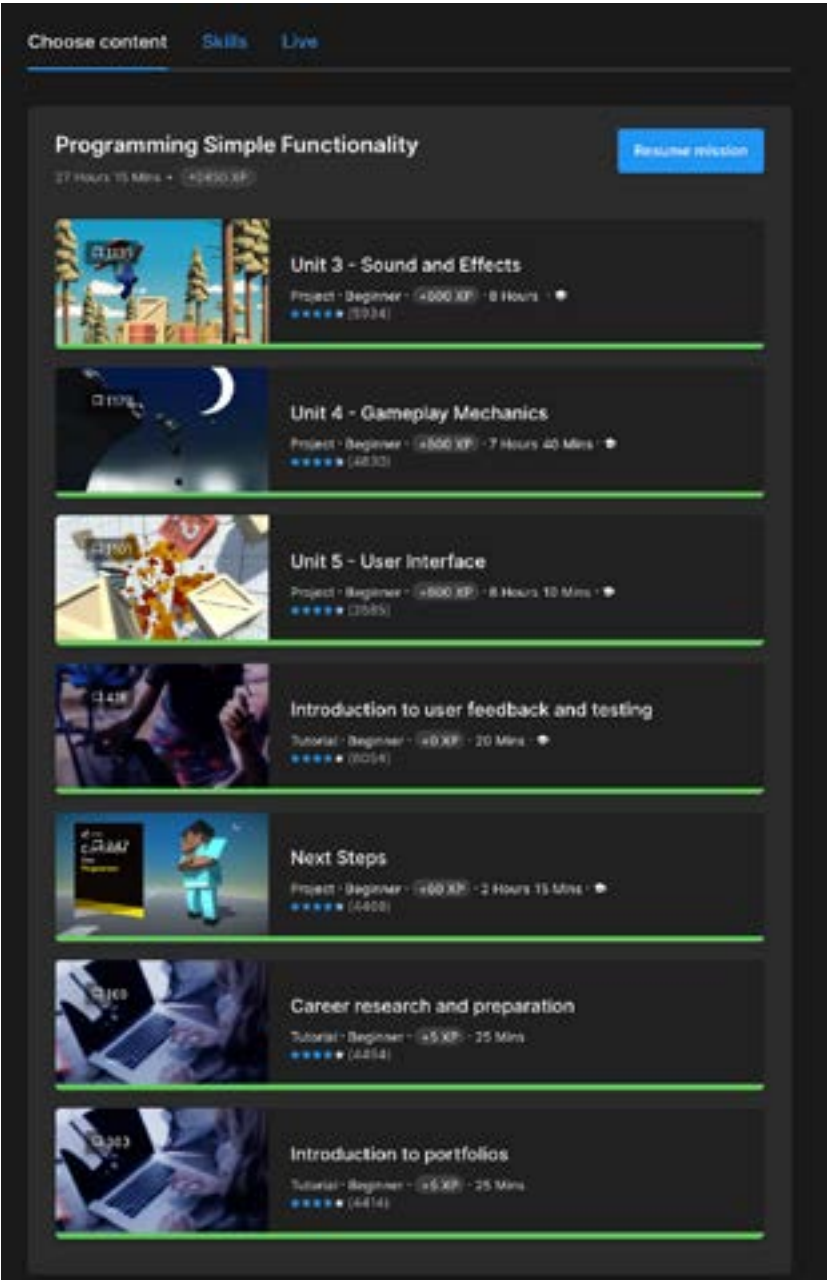
Gameplay Mechanics

Prototype 4: <https://play.unity.com/mg/other/webgl-builds-357547>

Prototype 5

User Interface

Prototype 5:
<https://play.unity.com/p/webgl-builds-357551/edit>



(Junior Programmer: Create with Code 1 - Unity Learn, z.d.)

VR Development - Pathway Unity

Na de helft van de junior programming cursus afgerond te hebben heb ik besloten om te beginnen met VR development omdat de tijd tikt..

VR Basics

In VR basics kreeg ik een uitgebreide cursus van 11 uur over de werking van VR in Unity bekijk lijstje hiernaast.

Tijdens de participatie ben ik de ruimte van mijn VR project aan het maken.



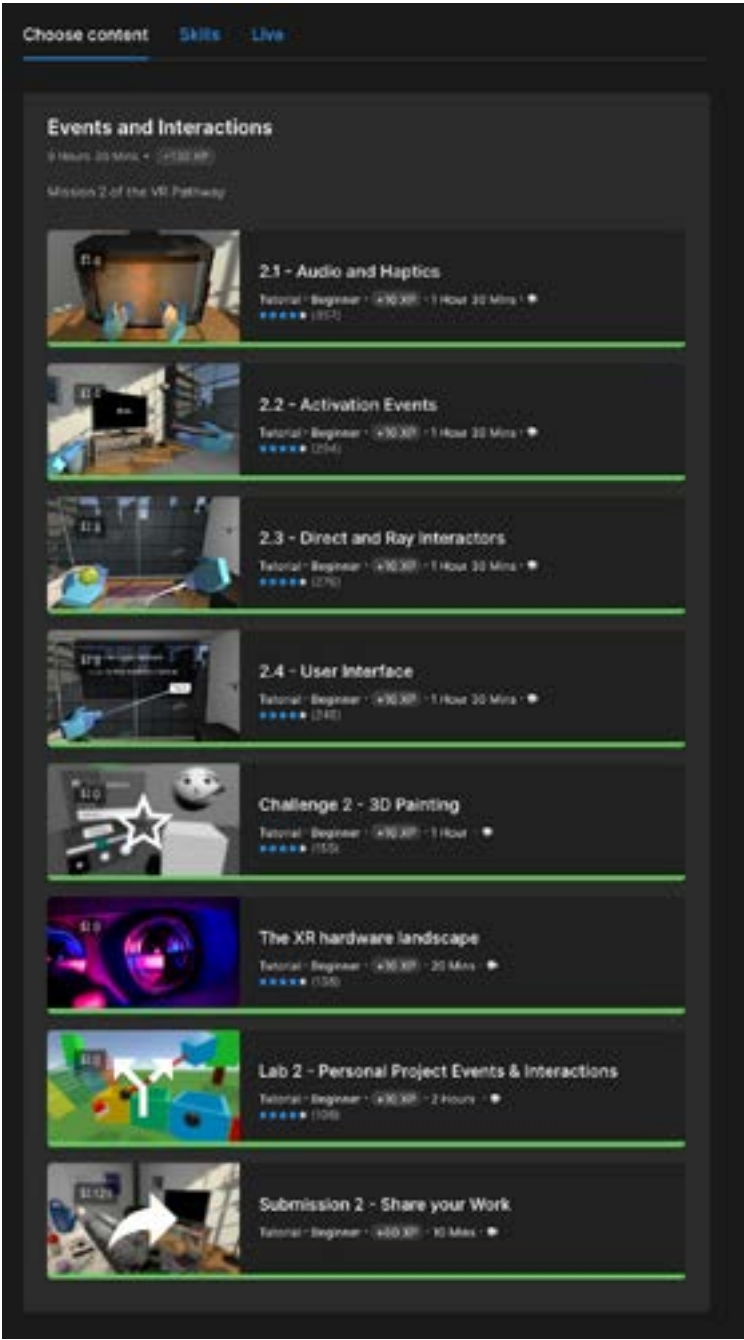
(VR basics - Unity Learn, z.d.)

VR Development - Pathway Unity

Na de helft van de junior programming cursus afgerond te hebben heb ik besloten om te beginnen met VR development omdat de tijd tikt..

Events and Interactions

In deze cursus heb ik veel met interactie gewerkt. De beste tot nu toe!



(VR basics - Unity Learn, z.d.)

When it comes to UX in VR projects, Best practices:

1. Understand your target audience:

Identy your target, Characteristics, preferences, skill levels.
Consider: Age, Experience with VR, specific goals or expectations they may have.

2. Intuitive and natural interactions:

Design Interactions that feel intuitive and closely resemble real-world actions.
Leverage the capabilities of VR controllers, Hand tracking, or other input methods to create natural gestures and movements.

3. Comfort and Immersion

Striving to create an immersive expereince while maintaining user comfort
Minimizing motionsickness by optimizing frame rates, reducing latency, and providing a comfortable field of view. Avoid sudden camera movements or drastic changes in the virtual environment.

4. Clear Visual Hierarchy

Ensure that important information and interactive elements are visually prominent and easy to distinguish from the surroundings. Use color, size and depth cues effectively to guide users' attention and provide clear visual hierarchy.

5. User-friendly menus and navigation

Design menus and navigation systems that are easy to understand and use within the VR environment. Consider spatial or gesture-based menus, allowing users to interact with the interface naturally.

6. Feedback and cues

Provide clear feedback to users about their actions and the system's response. Utilize visual, auditory, and haptic cues to acknowledge interactions, confirm actions, and provide guidance when neccesarry.

7. Optimize performance

VR experiences require high performance to maintain a smooth and responsive environment. Optimize your project's performance by reducing the number of polygons, optimizing textures, and using efficient rendering techniques.

8. User testing and iteration

Conduct regular user testing sessions to gather feedback and insights from real users. Iterate on your design based on the feedback received, ensuring that the VR experience aligns with user expectations and preferences.

9. Accessibility considerations

Consider accessibility requirements for users with different abilities. Provide options for adjusting text size, brightness, and audio settings. Make sure that interactive elements can be reached and activated by users with various physical abilities.

10. Onboarding and tutorials

VR Experience may be new to some users, so it's crucial to provide clear onboarding instructions and interactive tutorials to guide users through the basic controls, interactions, and mechanics of your VR project.

VR is an iterative process, it is essential to gather continuous user feedback and iterate on your designs to create the best possible user experience.

(VR basics – Unity Learn, z.d.)

Apple vision Pro

Apple Vision Pro

https://www.apple.com/apple-vision-pro/?&mnid=sOVpw8LmA-dc_mtid_20925xua42643_pcrd_661144946867_pgrid_158450703748_pexid__&cid=wwa-uk-kwgo-avalanche--slid--productid--BRAND-Avalanche-Announce-&mtid=20925xua42643&aosid=p238

The era of “Spatial Computing”.

It seamlessly blends digital content with your Physical space.

Navigation through

Eyes: Advanced Eye tracking with camera's, Eye recognition to open the system

Hands: By attached camera's on the outside it's able to track your hand gestures

no matter where it is with proceeding you just have to touch your index and thumb together.

Voice: Voice recognition

Applications: Free your Dekstop and your apps will follow

Your apps live in your space. The ultimate theater wherever you are.

Photo and videos: Be in the moment all over again.

Memories becoming alive: Vision Pro is apple's first 3D camera. You can capture magical spatial photos and spatial videos in 3D, then relive those cherished moments like you never before with immersive Spatial Audio. Your existing library of photos and videos looks incredible at remarkable scale. And panoramas wrap around you -- MAKING you feel like you're standing right where you took them.

Connection: Get on the same page in the same space. Making meetings more “meaningful”.

Enclosure : Singular piece of three-dimensionally formed laminated glass flows into an aluminum alloy frame that curves to wrap around your face.

Light Seal, gently flexes to conform to your face, delivering a precise fit while blocking out stray light.

Head Band, the head band provides cushioning, breathability, and stretch. The Fit Dial lets you adjust Vision Pro precisely to your head.

Power, The external battery supports up to 2 hours of use, and all-day use when plugged in.

Sound, Speakers positioned close to your ears deliver rich Spatial Audio while keeping you aware of your surroundings.

Interaction designed for spatial computing, built on the foundation of macOS, iOS, and iPadOS, visionOS enables powerful spatial experiences. Control Vision pro with your eyes, hands, and voice -- interactions feel intuitive and magical. Simply look at an element, tap your finger together to select, and use the virtual keyboard or dictation to type.

Apps leap into life. In visionOS, apps can fill space around you, beyond the boundaries

of a display. They can be moved anywhere, scaled to the perfect size, react to the lighting in your room, and even cast shadows.

Expand your surroundings.

Environments let you transform the space around you, so apps can extend beyond the dimensions of your room. Choose from a selection of beautiful landscapes, or magically replace your ceiling with a clear, open sky. The digital Crown gives you full control over how immersed you are.

Stay connected to people around you.

Vision pro helps you remain connected to those around you. EyeSight reveals your eyes and lets those nearby know when you're using apps or fully immersed in an experience. When someone approaches, Vision Pro simultaneously lets you see the person and reveals your eyes to them.

Privacy and Security

Optic ID - to authorize purchases and unlock passwords with the uniqueness of your iris. Optic ID data is encrypted, never leaves your device, and is accessible only to the secure enclave processor.

Data from cameras and sensors is processed at the system level, so individual apps do not need to see your surroundings to enable spatial experiences.

Eye input: Is not shared with Apple, third-party apps, websites, only final selections which are transmitted. with your fingers.

Kort gezegd, de apple vision pro zou de headset zijn voor mijn concept.

Prototyping in Unity

De user flow

Voor de prototype wil ik een ervaring creëren waarbij de gebruiker hulp krijgt bij tijdens het koken.

1. Grafische en hoorbare hulp

Door middel van visuele elementen zou ik de gebruiken kunnen helpen tijdens het koken. Voor audio is er een A.I. generated speech gegenereerd die de gebruiker helpt om de stappen te voltooien.



2. Haptische waarneming

In unity kan je de controllers laten trillen bij bijvoorbeeld het oppakken van een object. Hierdoor activeerd er een andere zintuig en komt de virtuele ervaring een tikje realistischer over.



"Mixed reality" bril voor mijn prototype gemaakt in blender.



Bij bepaalde interacties zijn er geluid en trillingen aanwezig in het ontwerp.

3. Mixed Reality bril

Bij het binnentrede van de VR wereld zie je momenteel niks na het opdoen van de Mixed reality glasses zie je een wereld vol met User interfaces te voorschijn komen.

Prototype

De prototype is te vinden in de bijlage als unity bestand.

Design keuzes

1. User Interface design

Momenteel heb ik een simpele UI met wit en blauw.

Feedback: Maak de UI doorzichtig en wazig zoals de User Interface van Apple vision pro.

Welkom UI

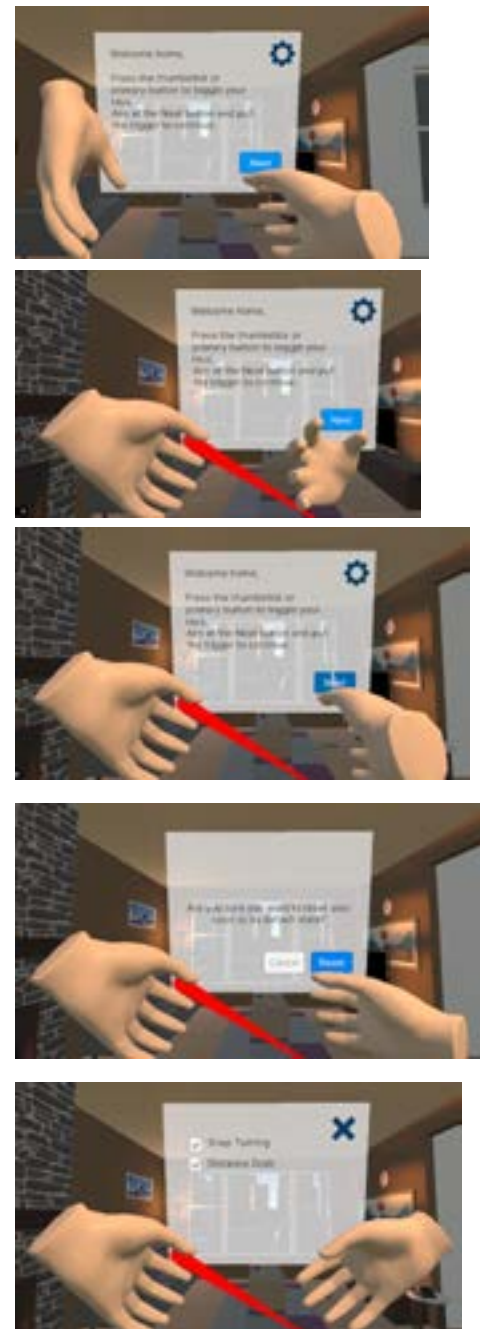
Voor de prototype zijn er User Interfaces ontworpen die toegankelijk zijn nadat de gebruiker zijn/haar Mixed Reality bril op doet.

In de welkoms UI krijgt de gebruiker een introductie, hij/zij kan settings aanpassen in de settings menu.

En de gebruiker kan met de secondary knop van elk controller het systeem resetten.



"Japanse keukenmes" voor mijn prototype gemaakt in blender.



Object UI “Onion”

Het object heeft een user interface die met de kijkrichting van de gebruiker mee gaat.

Een bewegend indicator dat helpt om te vertellen waar de gebruiker moet snijden.

De artificiële intelligentie kijkt mee met het process en geeft tips in audio/text en visuele elementen.

Gebruiker krijgt opties te zien die hij/zij persoonlijk lekker vindt en waarvan de producten op moet gaan voordat het verspilt wordt.



BIJLAGE SKILLS GELEERD IN UNITY



Prototyping with C# for Unity.

Start: <https://learn.unity.com/tutorial/welcome-to-the-pathway?pathwayId=627c12d8edbc2a75333b9185&missionId=62554983edbc2a76a27486cb#>

Unity Junior programmer course by Unity learn.

Unity and C#

Five prototypes together.

Quiz and challenge and personal project.

Design plan and build your concept.

Watch -> Then Do

After the video ends than do it.

Driving simulator prototype. Player control, input(keyboard mouse) to action.

New project

Unity Interface

Import Assets

3D Navigation

Scene view -> Interactive environment

WE learned:

Lesson 1:

Create a new project

Import assets

Add objects to the scene

Game vs scene view

Project hierarchy inspector

Customize the layout

Navigate 3D space

Move and rotate the objects.

Very first C# script.

Lesson 2

C# Scripts

Start vs Update

Comments

Methods

Pass parameters

Time.deltaTime

Multiply (*) operator

Components

Collider and Rigidbody

Lesson 3:

Variables

Different Data type

Access modifiers

Declare and initialize variables

Lesson 4:

Empty objects

Get user input

Translate vs Rotate

Lesson personal project:

Personal projects

Design documents

Project Timelines

Project milestones and Backlogs

Minimum viable products

Additional documentation

Depending on your project, you may need to create additional supporting documentation during the pre-production phase to help you scope and plan for production. You can iterate on these documents throughout pre-production and production, as needed.

These include:

Technical documentation: This includes documents that specify the architecture and functionality of the technical parts of a project.

Meeting notes: If you're working in a team, it's useful to capture meeting notes to record what the whole team is working on, dependencies, progress, and blockers.

Proposal or pitch document: If you need to get approval from your company, or if you are asking investors to fund your project, a formal proposal or pitch document is recommended.

- Introduction to Project Management and Teamwork <- Come back

Lesson 1 project 2

Adjust object Scale

If-Statement

Greater/ Less than Operators

Lesson 2

Create prefabs

Override prefabs

Test for Key presses

Instantiate objects

Destroy Objects

Else-if statements

Lesson 3

Spawn manager

Arrays

Keycodes

Random generation

Local vs Global variables

Perspectives vs isometric projections

Lesson 4

Create custom methods/ functions

InvokeRepeating() to repeat code

Colliders and Triggers

Override functions
Log Debug messages

New progress:
New project for your personal project
Camera positioned and rotated based on project type
All key objects in scene with unique materials

New concepts and skills:
Primitives
Create new materials
Export unity packages.

Lesson 3.1 Jump Force
New Functionality
- Player jumps on spacebar press
- Player cannot double-jump
- Obstacles and Background move left
- Obstacles spawn on intervals

Key Concept and skills
- GetComponent
- ForceMode.Impulse
- Physics.Gravity
- Rigidbody constraints
- Rigidbody variables
- Booleans
- Multiply/Assign (“*”) Operator
- And (&&) Operator
- OnCollisionEnter()

Lesson 3.2
New func
Background repeats seamlessly
Backgroun stops when player collides with obstacle
Obstacle spawning stops when player collides with obstacle
Obstacle are destroyed off-screen

New concepts and skills
Repeat Background
Get Collider width
Script communicatino
Equal to (==) operator
Tags
CompareTag()

LEsson 3.3
New Functionality:
The player starts the scene with a fast-paced running animation
When the player jumps, there is a jumping animation
When the player crashes, the player falls over

New Concepts and Skills:
Animation Controllers
Animation States, Layers, and Transitions
Animation parameters
Animation programming
SetTrigger(), SetBool(), SetInt()
Not (!) operator
Next Lesson:
We’ll really polish this game up to make it look nice using particles and sound effects!

lesson 3.4
New Functionality:
Music plays during the game
Particle effects at the player’s feet when they run
Sound effects and explosion when the player hits an obstacle

New Concepts and Skills:
Particle systems
Child object positioning
Audio clips and Audio sources
Play and stop sound effects
Overall Recap:
We’ve made an incredibly polished game - we have these super cool sound and particle effects. We have upbeat background music. We learned how to utilize animations for our characters, and we did some programming magic to make

our background endlessly scroll.

Player can move based on user input

Player movement is constrained to suit the requirements of the game

New concepts & skills:

Program in C# independently

Troubleshoot issues independently

New Functionality:

Camera rotates around the island based on horizontal input

Player rolls in direction of camera based on vertical input

New Concepts and Skills:

Texture Wraps

Camera as child object

Global vs Local coordinates

Get direction of other object

Next Lesson:

In the next lesson, we'll add more challenge to the player, by creating enemies that chase them in the game.

New Functionality:

Enemy spawns at random location on the island

Enemy follows the player around

Spheres bounce off of each other

New Concepts and Skills:

Physics Materials

Defining vectors in 3D space

Normalizing values

Methods with return values

Next Lesson:

In our next lesson, we'll create ways to fight back against these enemies using Powerups!

New Functionality:

When the player collects a powerup, a visual indicator appears

When the player collides with an enemy while they have the powerup, the enemy goes flying

After a certain amount of time, the powerup ability and indicator disappear

New Concepts and Skills:

Debug concatenation

Local component variables

IEnumerators and WaitForSeconds()

Coroutines

SetActive(true/false)

Next Lesson:

We'll start generating waves of enemies for our player to fend off!

New Functionality:

Enemies spawn in waves

The number of enemies spawned increases after every wave is defeated

A new power up spawns with every wave

New Concepts and Skills:

For-loops

Increment (++) operator

Custom methods with parameters

FindObjectsOfType

New Functionality:

Random objects are tossed into the air on intervals

Objects are given random speed, position, and torque

If you click on an object, it is destroyed

New Concepts and Skills:

2D View

AddTorque

Game Manager

Lists

While Loops

Mouse Events

Next Lesson:

We'll add some effects and keep track of score!

New Functionality:

There is a UI element for score on the screen

The player's score is tracked and displayed by the score text when hit a target

There are particle explosions when the player gets an object

New Concepts and Skills:

TextMeshPro

Canvas

Anchor Points

Import Libraries

Custom methods with parameters

Calling methods from other scripts

Next Lesson:

We'll use some UI elements again - this time to tell the player the game is over and reset our game!

New Functionality:

A functional Game Over screen with a Restart button

When the Restart button is clicked, the game resets

New Concepts and Skills:

Game states

Buttons

On Click events

Scene management Library

UI Library

Booleans to control game states

Next Lesson:

In our next lesson, we'll use buttons to really add some difficulty to our game

New Functionality

Title screen that lets the user start the game

Difficulty selection that affects spawn rate

New Concepts and Skills:

AddListener()

Passing parameters between scripts

Divide/Assign (/=) operator

Grouping child objects

New Functionality

Primitive objects replaced with new assets that function the same way

New concepts & skills:

Art workflow

High vs. Low Poly

Asset Store

Nested Prefabs

Material properties

5.Planning for user testing

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Define the objectives

Before you prepare the questions to get feedback from users, you should determine:

What you want to learn about your project

What you will show the users to elicit feedback (for example, wireframes, design mock-ups, or a prototype)

You can then assess your questions and testing session plan against these objectives, to ensure that they will help you get the information you need about your project.

Prepare the questions

Next, you'll need to prepare the questions that will guide the user's feedback. Depending on the type of feedback you're looking for, you might ask open-ended questions, closed-ended questions, or a combination of both.

Open-ended questions give the user freedom to explain their answers. Examples include:

How well do you think the design/prototype/product addresses [a user need]?

What were the moments in testing where you felt confused, and why?

How would you improve this experience?

Although these questions can work in a survey or questionnaire, it can be more useful to ask them through a conversation. This allows you to ask follow-up questions and gain a deeper understanding of the tester's thoughts

Closed-ended questions have predetermined answers, like those found in surveys. These might include:

A series of statements which the user will grade their response to, for example rating confidence on a scale from 1 to 5

Questions with simple Yes / No responses

These questions work well in a survey or questionnaire format; you don't need to ask them yourself.

It can be helpful to use both types of questions, not only to get a variety of information, but also because some testers may find it easier to give honest critical feedback via a survey rather than to a person talking to them directly.

Plan the testing session(s)

When you've defined the test questions, there are logistics to consider. You should:

Identify the best time and date.

Determine how to find testers from your target audience.

Identify the ideal number of testers.

Create an agenda for the testing session(s).

Plan to record the session (if applicable).

Choose a leader and note-takers for the session, if working in a team.

6.Preparing yourself to run the session

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User testing can be challenging to run effectively — once you've planned the session, you need to get ready to facilitate it. You can do this by preparing using the following tips.

Observe rather than guide

If you conduct your tests in person (in person or virtually), you may find it's extremely difficult to sit there and not say anything while the users try your experience or review your designs. You may also want to interject and tell them how to do things, if they're struggling! There is a balance to be struck here — if your testers are struggling with something so basic that they can't test your product, wait at least 30 seconds, make a note of it and then tell them what to do so you can get more information. On the other hand, if they can work through the problem, their solution will be valuable information for improving your design.

Don't explain or justify your design choices

If you gather qualitative feedback — for example, by having a conversation with the tester — again you may be tempted to explain things or justify the current implementation of your project. This can feel good, because it may "fix" the tester's understanding — but it will not fix what you're testing!

Don't problem-solve during testing

The user insights that come up during testing may immediately send you into problem-solving mode, thinking about how to correct any issues raised. Your tester may also start to focus on this, exploring potential solutions they think of rather than focusing on their experience.

It isn't that these suggestions for solutions don't have value, but the purpose of the testing session is to gain insights about their experience and to get deep information about their issues. Prepare yourself to remain in an observational role instead, actively listening to what the tester is telling you. You can also prepare to gently steer testers back to the problem they were explaining or the next question. If you don't feel confident doing this, try practicing with a fellow creator!

7.Facilitating the session

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There are different ways a testing session might be structured, but facilitators typically use the following broad structure:

Make introductions if testing as a group.

Identify the goal of the session.

Explain the recording policy (if applicable) and confirm the tester’s consent to this.

Provide the materials for testing, and observe the testers as they use or review them.

Ask the questions you have prepared.

Provide summaries of participant answers for clarification purposes.

Close the session.

Tips and tricks for facilitating

Here are some useful tips and tricks to support you in facilitating user testing sessions.

Remind yourself that you are not your product, and every product gets better with feedback — but only if you’re paying attention to what your users are telling you.

Frame the experience for participants. As each tester comes in, talk with them and explain what a user test is. Emphasize that you want all feedback, and negative feedback can actually be more helpful than positive feedback. Ask them to talk or “narrate” as much as possible while using the product or reviewing the materials, so that you can get a deeper understanding of their thought processes.

When the testing begins, make sure that you stop talking and record your observations in detail. Things that seem clear in the moment can easily get fuzzy if you only rely on your memory. What does the user struggle with? Is there any feature they’re not using as intended? Are they doing things that don’t seem to make sense?

If the user stops talking for a while, gently remind them to turn on the interior monologue again, but otherwise pretend you’re behind a one-way mirror.

If you conduct a conversation with a group of testers, make sure to include them all. Gently prompt quieter testers for their thoughts, to make sure their insights are included.

Immediately after the testing session, you should:

Make sure the session was recorded (if applicable).

Write down any additional notes or observations.

Debrief with fellow team members (if applicable).

Create a summary document highlighting areas to address.

Determine what you will and will not change based on the data and feedback collected.

Evaluating and acting on feedback

When you’ve collected all the feedback, it’s time to evaluate it and think about how you will respond.

Thoroughly read your notes and the questionnaires, and write down a summary of the results, whether positive or negative. This should be a bulleted list of statements, for example:

“Users didn’t notice that there were different kinds of towers.”

“Users found it easy to understand and use the in-context menus.”

Once you’ve done this, consider the action(s) you could take to address each issue where improvement may be necessary, and any dependencies these actions might have. This will help you evaluate the options you have for responding to the issues identified.

You don’t have to take action on every user test result, but it’s vital to listen to what your users are trying to tell you. If an important part of your product isn’t working well, it’s worth cutting some features to focus on fixing what’s there.

Before you finish this tutorial, take a quick moment to put yourself in the role of a user tester. You just need an open document or a scrap of paper, to record and organize your thoughts. To do this:

1. Choose one or two products (digital or physical) that you think are particularly well made. For example, a game or software with a particularly good user experience, or a kitchen implement that’s stylish yet functional.

2. Try to identify why you like the product so much. Use the following questions to help you:

What user needs does it address for you?

What is positive about the experience for you as a user?

How do you feel when you use it?

How steep was the learning curve when you began to use it?

Would you recommend it to others? Extend this answer by identifying who precisely you would recommend it to, and your reason for doing so.

3. This is a product that you like a lot, but take a moment to identify areas it has for improvement. Use the following questions to help you:

Do you have relevant user needs that it does not adequately address?

Do you have desires, rather than needs, that it does not address?

Are there areas where the experience of using it could be refined?

If you could say one thing to the people who designed and made the product, what would it be?

4. Take a moment to evaluate the feedback you’ve written up for the product. If you were part of the design and development team, would this give you enough information to:

Clearly identify the positive and negative aspects of the user’s experience of your product?

Begin to identify possible actions that might address any user pain points?

If not, try to identify the additional questions you would ask to get that information — this will help you scope your questions when you prepare for user testing something that you’re working on!

Share your experience

Were you surprised by the depth of evaluation you gave on the product? Did you need to identify a lot of follow-up questions to deepen your answers, as is the case with some testers? Take a moment to share a brief reflection on the exercise and explore others’ insights in the tutorial comments!

Installing export modules

Building for Mac/PC

Building for WebGL/HTML

In this tutorial, you learned:

The purpose of DOTS and ECS

The difference between data-oriented vs object-oriented / component-based design

How to recognize a class using ECS, including:

Different “using” statements (e.g. “using Unity.Entities;”)

Inheriting from classes other than MonoBehaviour (e.g. “JobComponentSystem”)

The structuring of code around data (e.g. “MoveSpeed”) rather than components or objects

Next, take a moment to consider the work you’ve done in this Pathway, other projects you’ve created, and the career research you’ve completed to determine your areas of interest.

Reflect on what’s right for you now

With this in mind, start to think about the type of portfolio that would best suit your needs:

Who is the target audience?

What is your portfolio goal? Is the purpose to provide evidence that you are ready for a job role, or to create a shareable record of progress so far?

Do you want to use a community portfolio tool or create a custom one?

At this stage in your journey, is a showcase or a skill-growth portfolio the best fit?

Take some time to consider the projects you’ve completed that represent your best work and highlight your skills.

Plan out your portfolio

Let’s start to plan your portfolio content, design, and flow. Using a document, paper, or sticky notes to organize your thoughts:

Create a list of the files and assets the portfolio will contain, and organize these into categories (for example, by skill, career or industry).

Determine the design and navigation style of your portfolio.

Draft an introduction or mission statement for your portfolio.

Identify the additional content you’ll need to create or curate for the portfolio. For example:

Text descriptions and reflections for each piece in your portfolio

A learning plan that identifies skills or concepts you might be lacking now, but want to gain moving forward

A slideshow on the front page or as part of the menu that briefly highlights the portfolio content

New Features:

Project is set up

Scene set up with Room

Tested with Device Simulator

Run on device

New Concepts & Skills:

Pipelines for different types of hardware

Packages required for VR Development

VR scene vs typical Unity scene

Rig Simulator vs on-Device testing

Tethered vs Standalone testing

Next Lesson:

VR Locomotion

New Features:

Designed room

Turning rig

Teleporting rig

New Concepts & Skills

Types of locomotion

(Room scale / Continuous / Teleport)

Vection & simulator sickness

Teleportation areas vs anchors

Next Lesson:

Grabbable objects

New Features:

Hand models

Simple grabbable ball

Grabbable tool with attach point

Organized Hierarchy

New Concepts & Skills

Unity vs Real-world scale

Grabbable object properties

Collision detection modes

(discrete vs continuous dynamic)

Movement types

(kinematic, instantaneous, velocity-tracking)

Next Lesson:

Sockets

New Features:

Added hats

Hang hats on hooks

Put hats on your head

New Concepts & Skills

Socket interactors

Triggers to detect interaction

Interaction layer masks

Next Lesson:

Audio and Haptics

New Functionalities:

Grabbable remote

play sound action

change material action

play video action

New concepts and skills

Object Activation

Events and actions

Scripts and functions

Next lessons

Direct and ray interactors

new functionality:

- Direct Interactors on each hand

Toggle direct interactors on/off with button

New concepts and Skills:

Direct Vs Ray Interactors

Detect Button press

Next Lesson

User Interface

New Functionality:

Welcome Screen with Ok button

Reset screen to reload scene

New Concepts and Skills

VR UI Best practices

Worldspaces vs Screenspace UI

Next lesson

Comfort and Accessibility

New Functionality:

Fade in from black

Teleportation fading

Settings Menu

New concepts and skills

Vr comfort

Vr Accessibility

next lesson

optimization

Vr bril - opdoen is UI zien.

VR linkerhand menu voor snellere settings

Beschrijving eten uitwerken en kook stappen

-> Als de gebruiker het mes aanraakt of de eerste ingredient vast pakt dan voert hij de

kookstappen uit. de ervaring is de kookstappen en wat er

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Prototype resources:

Cooking recipe;

https://www.simplyrecipes.com/recipes/french_onion_soup/

Stem:

Murf ai - <https://murf.ai/studio/project/2/P01688480685434648>