



**Adaptable Gaming &
Accessible Game Engineering &
Building an accessible Steering Wheel**

by June Schwenk

Adaptable Gaming & Accessible Game Engineering & Building an accessible Steering Wheel

Learnings, Project and Reflections

by June Schwenk, s0591188, HTW Berlin, 4th Semester Game Design

Course: ASSIST:HEIDI Summer school - Technikum Wien - Vienna

Date: July 7-15, 2025

Instructor: Martin Deinhofer, Msc.

0. Introduction

Page	Content
ii	0.1 Content
iii	0.2 ASSIST:HEIDI
V	0.3 Design Ethics
VI	0.4 Design Compass Values

1. Accessible Game Engineering

Page	Content
1	1.1 The Game Engine
4	1.2 Barriers and Solutions - Categories
6	1.3 Website Recommendations

2. Adaptable Gaming

Page	Content
9	2.1 Accessibility of computer games
9	2.2 Adaption Challenges
10	2.3 Accessible Controllers
12	2.4 Modified Gamepads/Controllers
13	2.5 Specialized Joysticks & Buttons
16	2.6 Eye Control & facial gestures

3. Building an accessible Steering Wheel

Page	Content
19	3.1 The Request
20	3.2 The Research
23	3.3 The Plan
24	3.4 The Wheel
25	3.5 The Sensor and Electronics
29	3.6 The Case
30	3.7 The 3D Print
31	3.8 The Learnings
31	3.9 Future Ideas
32	3.10 The Team

33	References
35	List of Figures
37	Acknowledgments

0. Introduction

0.1 Content

This booklet contains a general introduction into accessible and adaptable design as well as resources to find further information and education regarding the named topic. The educated topics got mostly acquired at the ASSIST:HEIDI Summer School which is also introduced later on. The reader can expect an introduction into design ethics and the basics of how to design accessible. Furthermore there will be an introduction into accessible controllers and other inputs used to make gaming accessible.

The final part consists of a report on a project in which a plan for an accessible gaming steering wheel was conceptualized and a prototype was built.

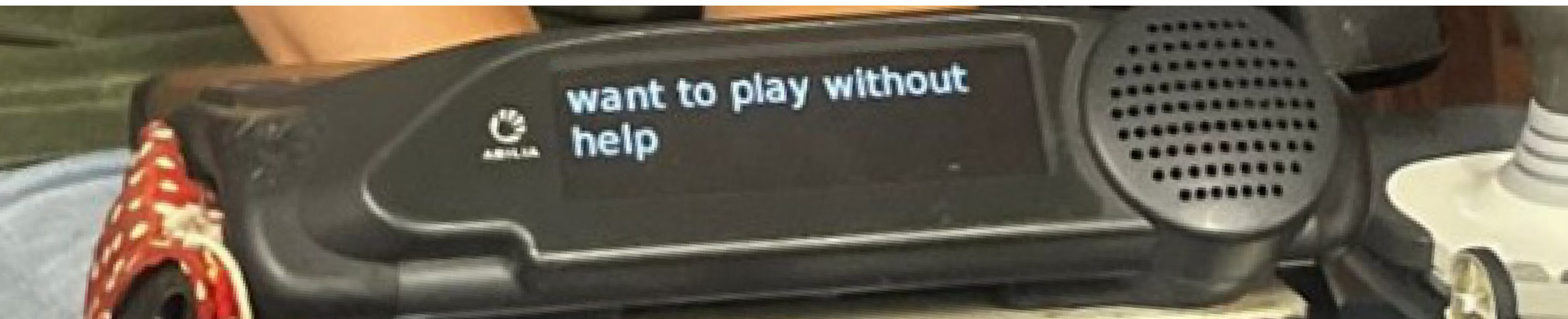


Figure 2: The screen shows: want to play without help

0.2 ASSIST:HEIDI

ASSIST:HEIDI is an international Summer School at FH Technikum Wien. In this Summer School students meet people with disabilities, to co-design and prototype individual accessible gaming solutions with them. The students also get taught the basics about disability, accessible gaming, rapid prototyping, programming or micro controllers by hands-on project work. (Assistive Technology Summer School, 2025)

The course is aimed to any student enrolled in an international or national university from a wide range of study backgrounds. The goal is to bring together people with a wide variety of experiences to be taught how to be more inclusive, develop new practices or apply common or new practices.

Most input for this booklet originates from the summer school or further research was made with it as a base. The Input included a basic explanation of accessibility in games and why it is important to create inclusive games, but also how games can be adapted for greater inclusiveness.

While learning about the many options to build inclusive controllers and how to make a game accessible for them the participants also gained a better understanding of how they can an impact on Accessibility in Design.



Figure 3: Presentation at ASSIST:HEIDI

Contributors in ASSIST:HEIDI 2025



Senior Lecturer/Researcher in AT, SW development, Digital



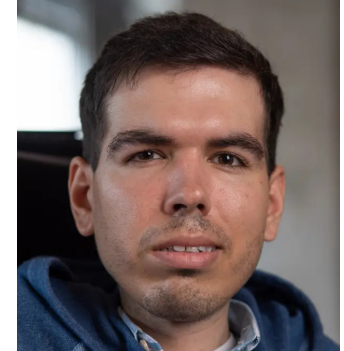
Lecturer/Researcher in Biomedical Engineering, Rehabilitation Technology, Accessibility



Lecturer/Researcher in AT, Microcontrollers, Web Development



AAC Expert, Ambassador and Lecturer, Chess Gaming



Senior Web Accessibility Engineer, Accessible Gaming Expert,



Teacher in School for the Blind, Braille expert, AT for



Accessible Game Dev., Co-Founder Inclusive Gaming GmbH



Gaming Expert, Project “Silver Gaming”, Special Education



Gaming Enthusiast, Expert and Blogger

© Photo: Anna Spindelndreier



Adaptive Gaming Expert, Senior Lecturer/Researcher in AT

0.3 Design Ethics

Disabilities as a social construct

Disabilities arise from the way society is structured rather than from a person's impairment or difference. Everyone experiences barriers. But society decides at what point a limitation is classified as a disability. This also determines which barriers are recognized as common concerns, and which are dismissed as too 'specific' to be given general consideration. This means that society is not designed to accommodate everyone, instead some people are excluded because of their needs from participating in many parts of life. (UNICEF, 2017)

Sensitive Language Usage

Not everyone prefers person-first language, so it's best to ask. For example, some may prefer "Blind developer" over "developer that's blind," or "Deaf" with a capital D over "hard of hearing." "If you're posting about a particular game or gallery featuring disabilities, it's usually better to say, "game featuring disabled characters," rather than, "game featuring characters with disabilities."" (caniplaythat.com - Game PR)

“Nothing about us without us”!

A fundamental principle of inclusive design is to collaborate with the individual people that are affected by the barriers. They are experts on the barriers that pose problems and should be consulted at every stage of the solution development process.

Basic Attitude

The common argument against adding inclusive in design is money. Every addition of inclusive “features” cost money, which would then be missing from the profit. It seems like an extra effort, to make the choice of being more inclusive. But thinking this way is a trap. Not being inclusive means, that there was a decision made NOT to include people. So until now, every design made, was done saving costs by not adding basic features for inclusiveness.

It is not more expensive than before because it takes more money, it was just less expensive before, because people chose to do less. With this attitude it is easier to argument at least for understanding the problem.

Accessible is individual - use Options

Each Person has a different need for accessibility. We are facing different barriers and need multiple diverse solutions to overcome them because every person can face different kind of barriers. This is why adding options is a common way of integrating more accessibility. This allows people to find the best settings for their personal needs.

0.4 Design Compass Values

The Access Design Compass of Values (Figure ??) was designed by Alice Di Pinto and developed during the course “Inclusion in Design” at HTW Berlin.

The Compass summarizes the foundation that of every accessible design should be based on.

The graphic uses an acronym – **ACCESS** – to remind you of six basic principles of inclusive design.

The first is “**All-inclusive**,” which involves considering as many people as possible in the design process. It's often important to ensure that a product can be used by everyone, but it's always important to consider as many people as possible with diverse abilities, needs, and backgrounds.

“**Clarity**” means making the design as easy to use as possible. An unnecessarily complicated design can fundamentally exclude many people from using it.

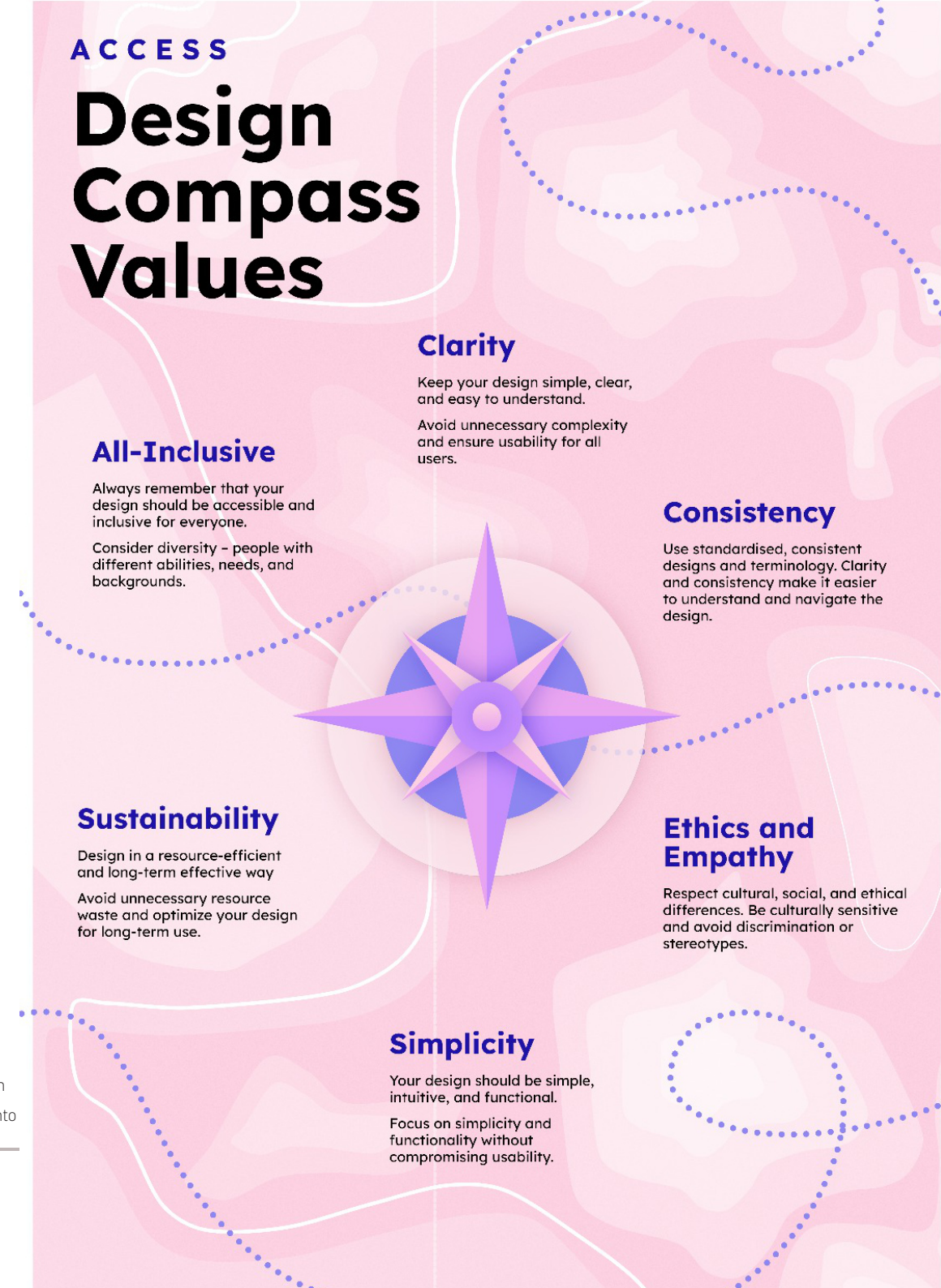
“**Consistency**” aims to reuse existing, standardized, and everyday solutions and avoid unnecessarily changing designs, but rather to pursue a clear approach.

“**Ethics and Empathy**” describes maintaining respect for different cultures, religions, and ethnicities and avoiding discrimination and stereotyping.

“**Simplicity**” means that functionality and simplicity should be balanced. They should not restrict each other.

“**Sustainability**” is about resource efficiency. It's important that the resulting product lasts a long time and that no additional materials are wasted.

Figure 4: ACCESS Design
Compass by Alice Di Pinto



1. Accessible Game Engineering

Accessible Game Engineering teaches how a game can be made more inclusive right during the development phase. This chapter includes information on how to start developing games, an introduction into game engines and examples of guiding principles for inclusive games engineering.

1.1 The Game Engine

Developing games becomes more easy nowadays. While before people had to know how to program and use a lot of time generating the games world, there are now so called game engines that help shortening the process and bridging the the need of programming with simpler and often visual solutions.

A game engine makes it possible for people with no programming knowledge to develop games. They are used as standard in game development and have different uses. They also reduce development effort while the results are of high quality. Publicly available game engines make it possible for a much wider range of people to develop games. The game engine developers themselves, but also to a large extent the game developer community, publishes a large number of tutorials on the individual functions of the engines and how to use them to develop games. These make it possible for nearly anyone to start doing games. Some engines are even known to be a place to

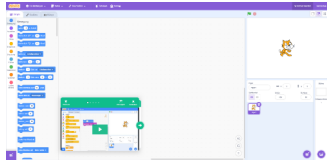
share free content, that can then just be puzzled together to build a full game.

As said before it is not important to be a good coder to be able to make games, but some understanding how coding works might be important to be able to understand the logic behind the engine.

One way is, to watch tutorials about how to use the engine. In these videos the creator often explain why the code is like this. The engines use different code languages, for example: C++, C# or specially designed languages based on existing programming languages like python, but greatly simplified for use in the game engine.

Many engines also offer visual coding, which are blocks that can be puzzled together. The rules if a block fits to another one is based on the programming language it is based on. But the users are able to learn it, without knowing the language

It is always good to have at least some understanding of how a programming language works and why it is used. To get some understanding of programming, there is one game engine, that is very simplified and teaches the rules of programming: Scratch. This program offers a 2D World to design simple games based on a visual and easy to understand programming language specifically designed for young humans. The following is a list of some well-known game engines and their usages.



Webversion of Scratch scratch.mit.edu/

- Visual Coding
- Easy Entry
- Developed to teach coding

Scratch

Scratch was specifically made to learn coding. It is very easy to use because it was made for kids. It relays on puzzle mechanics to teach coding and can be used to create simple to complex 2D game's. The export options are limited to the scratch platform.



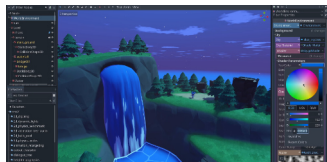
Games made with Unity, Image by Razzen.com

- C#/Visual Coding
- Easy Entry
- Big community
- Versatile platform export

(Wilhelm,2025)

Unity

Unity is the one of the most advised starter engines. With “Unity Learn” and the well written and detailed documentation, it is easy to use the engine as a starter. The versatile usage options and the ability to add self-written plugins makes it also perfect for big companies and game studios. Many popular games were created within this engine. (Wilhelm,2025)



Godot Engine, by Alfred Baudisch

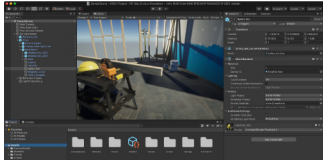
- GDScript (Python-like)
- Easy to learn
- Many tutorials plus documentation
- Fully Open-Source

(Wilhelm,2025)

Godot

Godot Engine has the advantage of being based on a language that is particularly beginner-friendly and is resource-efficient in terms of hardware. The workflow differs from other game engines which makes it easier to use for some users, while the community is big and supportive. There are two different engines depending if 2D or 3D and it is completely free to use. (Reddit: Denxel, 2020)

The Game Engine



Unreal Engine, by Unseen 64

- C++/Visual Coding
- Wide range of Tutorials
- Many Assets
- Focus on 3D games

(Wilhelm,2025)

Unreal

Unreal is another Game Engine that is used by many game studios. It is more focused on 3D and has a big asset store with lots of free content. The engine is very powerful and requires a good set of hardware, but also has very high potential of making a game quick and complex, after learning how to use it.



Game Maker: Studio by Gilar
Ramdhani (2022)

- Game Maker Language
- Easy to learn and use
- Focus on 2D Games

(Wilhelm,2025)

Game Maker

Game Maker is beginner friendly and intuitive for 2D Games. Possibilities are more limited and it is less powerful than other engines. The documentation is detailed and easy to read. (Reddit: LimerickExplorer, 2019)

1.2 Barriers and Solutions - Categories

There are four areas subdivide the different barriers in digital games. Each area includes different disabilities and individual disabilities can appear in one or more areas. Classifying barriers rather than deviding it by different disabilities makes it easier to find solutions and create an overview for the developers to integrate them into the production.

Visual Barriers

A visual impairment involves either partial or complete loss of vision. There are various levels of impairment: the inability to properly perceive one's surroundings, blindness, color vision deficiency, or loss of contrast. A distinction is also made here as to whether a visual impairment is degenerative or permanent. According to Deng (2024), there are certain key considerations for blind accessibility in (2D) games:

High Contrast options is helping people with low vision and colorblind-friendly design might also help Auditory cues and

feedback are a primary way for blind people to receive informations. might also help Adding sounds to f.e. enemies that moves with them makes it possible for blind players to know the position of the enemies.

Text-to-speech is used to convert texts into spoken language and voice navigation to guide players in moments of need.

When developing games for people with disabilities, care should also be taken to ensure that the game mechanics are understandable even without visual effects and cues.

Cognitive Barriers

Cognitive Barriers arise for people with divers disabilities. One of them is Dyslexia: playing games that rely heavily on text are a main barrier, but also memorizing the controls, make players frustrated and disconnect from the game world (Oliva-Zamora & Mangiron, 2025). The Accessibility solutions might be an option for Easy-Language, Text-to-speech, remappable controls, revisitable Tutorials anytime and frequent reminders, hints and cues.

Cognitive impairments are multifaceted, and there is less research on accessibility in games than in other areas, such as visual or auditory disabilities (Oliva-Zamora & Mangiron, 2025). Serious games are usually the ones that specifically address this issue. Given the range of games, and especially in larger game companies, the "danger" of features being exploited to cheat is often considered more important than making the game playable for more people. (Examples: the ability to slow down games,

Physical Barriers

In digital game the physical Barriers are mainly connected to the required input devices. Depending on the device used, there are often limited input devices for operating the games available on it. PCs are the most flexible, but accessible controllers are generally expensive and not always usable for every person with a physical disability, as needs are often very individual. There may be little muscle strength, or a lot but uncontrollable

movement, so that only some limbs, or only the mouth or eyes, can be achieved. It is difficult to find a general solution, but throughout this booklet, accessible controllers and special buttons and input devices will be presented from version 2.3 onwards. Furthermore, it is important in development that the control system requires as few buttons as possible and that the games have a remapping function so that the keys can be

Auditive Barriers

Auditory impairments are divided into different categories: deafness and hearing difficulties. When creating a game, care should be taken to ensure that conversations, environmental sounds, and recorded songs are legible with subtitles and close captions. Vibrations and visual cues can help players perceive auditory cues. In the settings, it's important that the individual sound categories can be adjusted independently of one another, so that, for example, more important sounds are louder than others.

Other Barriers

Other barriers can be financial or economic; newer games in particular are often more expensive. Financial barriers disproportionately affect people with disabilities, as they often rely on additional assistive technologies or specialized hardware, making access to video games even more costly compared to non-disabled players. Language barriers are currently less of a problem in the gaming scene as long as you speak more widely spoken languages. Localization is now standard for many games. However, there are many languages that are neglected or whose translation quality is poor, thus disrupting the game's immersion. Social and cultural barriers also arise. The online community can be toxic, and cultural references only achieve regional understanding. Some mechanics or content of a game can be triggering, overwhelming, or discouraging for players. It is therefore important to place trigger warnings before relevant game content. Technical requirements also deter some players from playing a game; graphically complex games in particular often require an expensive computer setup.

1.3 Website Recommendations

It is important to stay up to date on the topic of accessibility. To do this, it is a good idea to follow certain websites and pay attention to for example game reviews. New ideas for better inclusion are constantly being found and new barriers are defined that need to be addressed.



Can I Play That?

Focus on: Shows which games are accessible for whom

Can I Play That? Provides accessibility game reviews, commentary, news and accessibility reference guides. The contributors are disabled gamers, that review games and toys regarding the possibility of usage depending on different disabilities.
caniplaythat.com/



Gaming ohne Grenzen

Focus on: Tares accessibility of games (German)

Gaming ohne Grenzen is an initiative of the “Fachstelle für Jugendmedienkultur NRW” that has the goal of opening spaces for ??????
gaming-ohne-grenzen.de/



Audiogames

Focus on: Specialized in accessible games for blind gamers

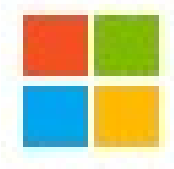
fog.audiogames.net



Pokédex of Accessibility

Focus on: Website and App Accessibility teaching in a playful way

a11ynews.substack.com/p/the-pokedex-of-accessibility



Xbox Accessibility Guidelines

Focus on: Guidelines for accessible game dev.

learn.microsoft.com/en-us/gaming/accessibility/guidelines



Igda-gasig

Focus on: Specialized in accessible games for blind gamers

Provides resources, networking, and guidelines to advance accessibility in games, supporting developers and researchers with best practices
igda-gasig.org/



Accessible Player Experiences (APX)

Focus on: Website and App
Accessibility teaching in a playful way

A framework helping game developers understand and design for different accessibility needs by connecting design patterns to player experiences
accessible.games/accessible-player-experiences/



Special Effect devkit

Focus on: Guidelines for accessible game dev.

A free, video-based online resource from SpecialEffect that provides developers with practical concepts for motor accessibility, such as multiple input devices, remapping, sensitivity adjustments, assistance functions, and simplified controls.
specialeffectdevkit.info/

2. Adaptable Gaming

2.1 Accessibility of computer games

With 176 billion US-\$ Computer games are the largest sector of the entertainment industry. Some games are already playable for people with different disabilities. Nevertheless, inclusion efforts in this area are still in their infancy. Progress has already been made in areas where the gaming industry sees potential to raise the profit:

- Precisely adjustable difficulty
- Key and button remapping for reassignment of controller functions
- Settings for contrast / brightness / complexity of graphics display
- Subtitles, visual aids
- Audio guides, warning signals

(Deinhofer, Veigl 2025)

Making games more accessible after it was already published are often limited and depend on what options the developers allow for example, the possibility to add mods or what kind of inputs are permitted. Therefore, unless otherwise indicated, the following chapters refer to the current standards in (computer) popular games.

2.2 Adaption Challenges

Not every controller can be used by every person. Conventional controllers are designed for the general public and prevent people with various physical impairments from controlling games at all. Solutions include either adapting a bought controller or build an entirely new one with specific input mechanics. But builders face some problems:

Technical Challenges

Many PC and console games are built to recognize only XInput (Xbox standard) or DualShock/ DualSense (PlayStation standard). For building a new controller device it is often important to emulate an existing controller to be able to work in every game. Custom devices require special drivers or middle ware, which can be inconsistent depending on the operating system, especially for accessibility hardware.

Also the used game engine can limit the developers in adding more variety. Engines can be limited to recognize mainly common used controllers and so miss unconventional ones. This requires game developers to add custom input parsing.

Many technical problems can be solved using Steam Input API. Steam is a platform for publishing games, but also the ability to translate inputs from almost any device into a format that games understand. Users are also able to remap buttons in the steam overlay level, so they don't have to remap them in every game. Still this only solves the problems for PC gamers and games that

are not available on steam require extra steps. For consoles additional converter have to be bought and added.

Market & Licensing Challenges

Consoles like PlayStation require licensed controllers to function properly. The use of unlicensed devices might work for a while but risk of being blocked by the next firmware update. Gaining an official support requires to go through certification process which is expensive and restrictive. This is why many small accessibility-focused companies can't afford official support.

Accessibility Paradox

Devices made to help disabled players often still require extra setup like remapping, software calibration, hardware setup and more. Often this means, that an additional person has to get involved setting up the new controller setup. The players then also have to relearn how to play the game with the new controller. Because usually a game's controls are specifically set to fit an able person. Another barrier are the high acquisition costs. Covering these costs can be difficult, especially since they are often higher than those for conventional controllers and, in addition, there is often no significant cash inflow.

Game related problems

If developers do not pay attention to accessibility and incorporate appropriate interfaces into the game, it is particularly difficult to make them accessible retrospectively. Key mapping is now a fundamental part of game design, but the quality still varies greatly. How many keys are needed to control the game? Which controllers are recognized, and is it possible to add new content and improve accessibility by creating mods for the game?

2.3 Accessible Controllers

The ability to remap controls in a game opens up many possibilities for people with physical impairments. In these cases, an accessible controller can be used.

The following section contains ready to use adaptive controllers and Kits:



Xbox Adaptive Controller with 4 extra

Xbox Adaptive Controller

Company: Xbox

Price: 89 €

Details: requires additional Buttons, 4 saving profiles

Source: Deinhofer, M. Veigl, C. (2025)



Logitech Adaptive Gaming Kit

Logitech Adaptive Gaming Kit

Company: Logitech

Price: 99 €

Details: 10 Buttons in different sizes attachable on a Velcro pad

Source: Deinhofer, M. Veigl, C.



Byowave Proteus Controller Kit in different configurations

Byowave Proteus

Company: Byowave
 Price: 299 €
 Details: plugable modules in 100 possible combinations
 Source: caniplaythat.com (n.d.)



Hitbox Arcade Stick

Hitbox Arcade Stick

Company: 8BitDo
 Price: 90 €
 Details: All-button input, no stick movement required
 Source: caniplaythat.com (n.d.)



Sony Access Controller

Sony Access Controller

Company: Sony
 Price: 80 €
 Details: Changeable Button tops, Assignable functions, Co-pilot mode, PS only
 Source: Deinhofer, M. Veigl, C. (2025)



Xbox Elite Wireless Controller Series 2

Xbox Elite Wireless Controller series 2

Company: Xbox
 Price: 148 €
 Details: Remappable inputs, trigger locks, swappable parts
 Source: caniplaythat.com (n.d.)



PICKTEK Controller

PICKTEK Controller

Company: PICKTEK
 Price: 27 €
 Details: PS4, Cheap, Offset sticks, contoured triggers, raised buttons
 Source: caniplaythat.com (n.d.)



IkkeGol USB Foot Pedal

IkkeGol USB Foot Pedal

Company: IkkeGol
 Price: 40 €
 Details: Programmable foot input, hands-free accessibility
 Source: caniplaythat.com (n.d.)

2.4 Modified Gamepads/Controllers

Depending on the players needs and technical resources it is also a common method to either modify an already existing controller or to buy individual, custom-made buttons and other input tools where the lineup can be determined independently.

3D-printed controller modifications

- One-handed DualSense (PS)
- One-handed Nintendo Switch
- Xbox controller extensions
- <https://thecontrollerproject.com/>



11

Figure 5: 3D-printed controller modifications, Deinhofer, Veigl(2025)

Additional parts are attached to an existing controller to make it accessible. These parts are often printed using a 3D printer. The plans are often published online for free usage. There are also specific events (e.g. ASSIST:HEIDI Summer School) where people design modifications for a specific use and then share their results online to help exploring new approaches.



Rest Kit by Thumb Soldier

Thumb Soldiers

Price: From £12.40 to £17.85
Details: controller acces-sories and attachments without the need to disassembly controller
Source: thumbsoldiers.com/



Alpakka controller by Input Labs

Input Labs

Details: free 3D files and instructions for DIY Controller, further support if needed
Source: inputlabs.io (n.d.)



Single-handed Dual Shock 4 controller by The Controller Project

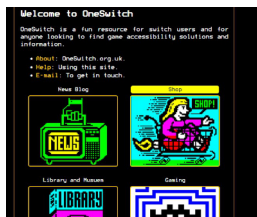
The Controller Project

Details: supplier of free controller modifications to gamers with disabilities, community of volunteers
Source: thecontrollerproject.com (n.d.)

2.5 Specialized Joysticks & Buttons

Building a controller requires different levels of skills and knowledge depending on the chosen option. Preselected kits are available to simplify the process of building controllers. But also communities that are open to help and advise each other. To be able to use self-build controllers it is often necessary to add a controller adapter. This transforms the input to be readable for pc or console and can also add functions like autofire or other macros. The costs are between 40 and 100 €.

The following section contains suppliers of ready-to-use controller kits, websites for open source 3D prints, and a selection of special input devices but also websites for support and topics regarding inclusive gaming.



One Switch Website

One Switch provides a wide range of solutions for accessibility in gaming, even in physical games and for daily life struggles and toys. The website also includes news and art while providing supportive informations about assistive technology, funding, Shops, DIY guides, health and how to find community in UK.

One Switch

Details: offers a wide range of adaptable controllers for a variety of needs in their shop and guides how to adapt gadgets for daily life.



MakersMaking Change Game Kit

Makers Making Change provides a wide range of products and also helps gamers to find their specific solutions to be able to play games on their own. They provide 3 Tier Kits with a checklist of devices that can be useful depending on the persons needs or game requirements. The document is available under: <https://www.makersmakingchange.com/s/game-kit-landing-page>

Game Kit

Company: Makers Making Change

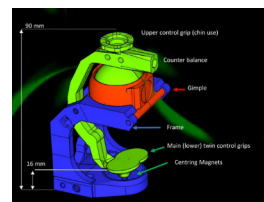
Details: 3 kits with options for different inputs, close support

	LITE	STANDARD	DELUXE
JOYSTICKS (PLUS TOPPERS)	2	4	9
ASSISTIVE SWITCHES	6	13	22
GAMING TRAY	1	2	2
MAGIC ARM	1	1	2
SWITCH INTERFACE	0	0	1
CABLE ORGANIZATION	Included	Included	Included

A full checklist of the exact devices in each tier can be found in the sections below.

MakersMakingChange Game

Kit Tier List



Celtic Magic Dang Mouse

Input

Celtic Magic provides very specific input devices that where specifically designed for people with physical impairments. They are offering various solutions and support to find the best depending on the users needs.

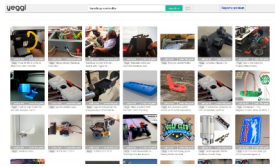
Celtic Magic

Company: celticmagic.org

Details: offers a selection of very specific input devices, own production, advises, use for Xbox Adaptive Controller



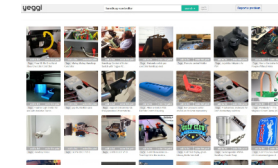
Celtic Magic Categories



Yeggi website results for handicap controller

yeggi

Details: free 3D files also for accessibility parts
Source: yeggi.com (n.d.)



Yeggi website results for handicap controller

Nintendo Hori Flex

Price: 250 €
Details: Converter for custom input in Nintendo Switch, 15 built-in buttons, No co-pilot mode

Source: yeggi.com (n.d.)



Nunchuck for adaptive controllers

Accessibilitas.es

Details: free 3D files also for daily life and gaming accessibility

Source: accessibilitas.es/en/3d-designs/ (n.d.)



Quadstick mouth control with chin joystick, Deinhofer, Veigl(2025)

Quadstick mouth control

Price: 500 €
Details: Extensive configuration options, Large gaming community, up to 4 suction/puff channels, additional chin joystick
Source: quadstick.com (n.d.)



Various articles on makezine website regarding accessibility

Make:

Details: presents and review ideas of accessibility tools and ideas
Source: makezine.com (n.d.)



Game Control Mixer

Game Control Mixer

Price: 130 €
Details: Universal system for controlling complex games with few input channels, multi-platform
Source: oneswitch.org.uk/page/gcm100 (n.d.), Deinhofer, M. Veigl, C. (2025)



FlipPad

FlipPad

Details: DIY-Kit, used an alternative to a mouse, joystick, includes Click function, combinable with other devices and controllable via infrared
Source: <https://www.asterics-foundation.org/projekte-2/flippad/>



FlipMouse

FlipMouse

Sensitive zero-distance joystick for detecting the slightest movement of the mouth, finger, or puff
Source: <https://www.asterics-foundation.org/projekte-2/flipmouse/>



FABI

FABI

Details: Interface for up to 9 external buttons or homemade electrical contacts and certain pressure sensors, PC or smartphone
Source: <https://www.asterics-foundation.org/projekte-2/fabi/>



One with Pulse by Oneswitch.org.uk

One Switch Pulse

BY ONESWITCH.ORG.UK

Gaming system for one and two-switch users.

Single-button control of complex games

Holding a button is a common input in games for example for walking, acceleration or fire. This is though not possible for people with low muscle control or strength. The “One Switch Pulse” system by Oneswitch.org.uk focuses on this exact problem. They solve it by adapting games and hardware for single-switch input. The complex controls are converted into simple one-button actions through remapping or special software. Players are provided fitting input devices and the shop offers interface boxes and adapters to make the switch work on consoles, PCs or toys. For further information it is advised to read the guide *One Switch Pulse*. [Doc File] by Barrie Ellis.

Source: oneswitch.org.uk/page/one-switch-pulse

Open device

Load from device

Save to device

Mappings

Settings

Macros

Expressions

Actions

Monitor

Examples

	Input	Output	Layer	Sticky Tap Hold	Scaling
x	Right button	Left button	☒ ☐ ☐ ☐	☐ ☐ ☐ ☐	1
x	Middle button	Right button	☒ ☐ ☐ ☐	☐ ☐ ☐ ☐	1
x	Expression 1	Cursor X	☒ ☐ ☐ ☐	☐ ☐ ☐ ☐	1
x	Expression 2	Cursor Y	☒ ☐ ☐ ☐	☐ ☐ ☐ ☐	1
x	Expression 3	V scroll	☒ ☐ ☐ ☐	☐ ☐ ☐ ☐	1
x	Expression 4	V scroll	☒ ☐ ☐ ☐	☐ ☐ ☐ ☐	1
x	Expression 5	Cursor X	☒ ☐ ☐ ☐	☐ ☐ ☐ ☐	1
x	Expression 6	Cursor Y	☒ ☐ ☐ ☐	☐ ☐ ☐ ☐	1

Settings to reconfigure inputs with HID Remapper Tool.

HID Remapper Tool

HID Remapper Tool is a software to reassign inputs from Human Interface Devices (HID) - like keyboards, mice, gamepads or custom switches - to different actions. With this tool it is imposible to combine different devices and the device types can be changed with less problems. The different interface options are based upon Rapsberry Pi. (Deinhofer, M., Veigl, .C (2025)

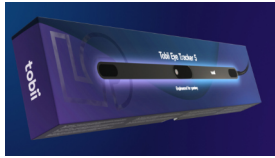
Source: remapper.org



Playing Minecraft with Gesture Mouse

2.6 Eye Control & facial gestures

Eye control and facial gestures are alternative input methods for players who cannot use their hands of feet to control the game. The eye tracker detects where the player is looking on the screen and allows actions such as aiming, selecting menus, or moving the camera. Looking into specific directions or making facial expressions can also be used as a trigger for an action ingame. It is also possible to add voice commands. The next section lists a variety of common used products and research projects.



Tobii Eye Tracker 5

Tobii Eye Tracker 5

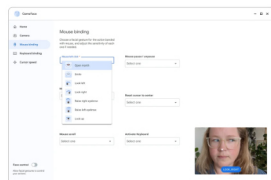
Details: attachable device that uses eye and head tracking for immersive, hand-free control in PC games
Source: gaming.tobii.com/



Kinesic Mouse

KinesicMouse

Details: hands-free input device, using Apple Face ID®, detects head rotations and facial expressions.
Source: kinesicmouse.cesity.at/



Game Face Binding Configuration

Project Gameface

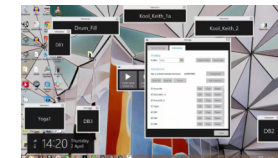
Details: open-source, hands-free gaming mouse that enables users to control a computer's cursor with head movements and facial gestures
Source: blog.google/technology/ai/google-project-gameface/



Cephable Interface

Cephable

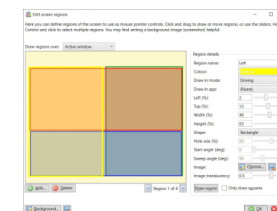
Details: hands-free control using voice, facial expressions and head movements, adds virtual buttons, free for personal use
Source: cephable.com/



Project Iris

Project Iris

Details: assistive program for using Tobii EyeTracker, which enables eye-controlled input, activates customisable on-screen “interactors”
Source: iris.xcesity.at/



Game Control Mixer

AltController

Details: on-screen fully customisable screen overlay for buttons, open-source
Source: altcontroller.net/

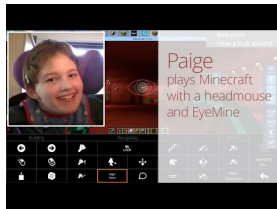
- Example configuration
 - Pointed mouth: left mouse button (mines)
 - Eyebrows up: right mouse button (build)
 - Open mouth: Repeat menu selection and last action



Gesture Mouse by Martin
Deinhofer example
configurations

Gesture Mouse

Details: A program that allows to control the mouse and keyboard with head movement and facial gestures. This project is based on the google mediapipe library
Source: github.com/asterics/gesture_mouse



EyeMine used by a player

EyeMine

Details: Adapted version of Minecraft suitable for eye tracking. Game actions can be selected in the EyeMine menu
Source: specialeffect.org.uk/how-we-can-help/eyemine

3. Building an accessible Steering Wheel

3.1 The Request

During the ASSIST:HEIDI program, several use cases were presented. These cases were specifically requested by people who are prevented from playing certain games (digital and analog) due to barriers.

The case that was to be solved in this team was to adapt the controls for a specific racing game - Wreckfest - for a user with physical barriers.

The design was developed with close attention to user needs. Regular interviews and feedback sessions were conducted to gain a deeper understanding and ensure the product's suitability. The project further benefited from the expertise of professionals involved in the ASSIST:HEIDI initiative.



Figure 6: Natascha says: "want to play without help"

Needs Assessment

The user has Cerebral Palsy which is a neurological disorder that effects the control over muscle movement, balance, and posture. In an interview, the user's wishes and exact abilities were recorded. The wish is to be able to play a specific racing game with a steering wheel that is as realistic as possible.

Further results were as follows:

- The left hand is best used for steering
- Movements work well with a steering wheel
- They tend to be jerky and very powerful
- Steering wheels available for purchase are not stable enough and break

It was also important to the user that the experience be as realistic as possible so that she could get a little closer to her dream of driving.

3.2 The Research

There were several different challenges that had to be overcome. The technical limitations related to the use of different sensors. Not all sensors were suitable for this project. It was therefore important to test all sensors in order to understand and apply their functionality.



Figure 7: Testing the IMU Sensor.

Selfbuild controllers usually require an PCB - Printed Circuit Board or a micro controller to link buttons and inputs so they can be read by the computer. By reusing the electronic parts of the bought steering wheel it was possible to save time and resources.

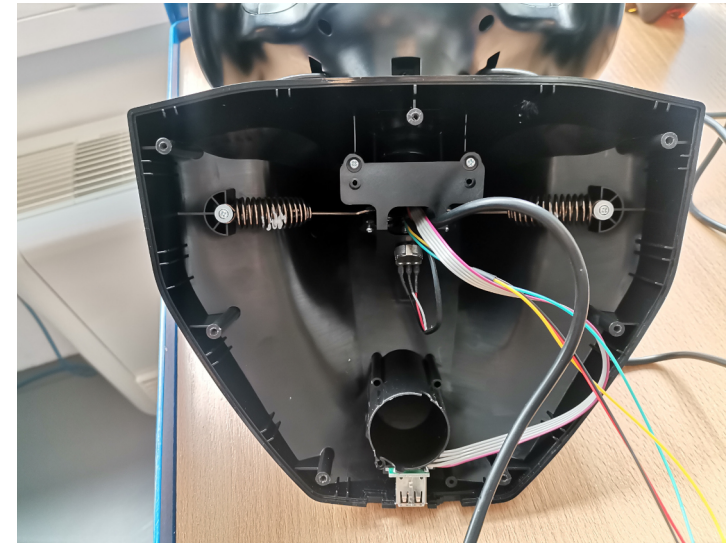


Figure 8: Examining a Steering Wheel

The materials also had to be carefully selected. Commercially available steering wheels are mostly made of plastic. Plastic breaks easily and poses a high risk of injury due to its sharp edges. In order to build a durable steering wheel, it was decided to use wood and metal. The steering system was to be inspired by commercially available systems, but to make it more robust so it could withstand long periods of play with strong and abrupt movements.



Figure 9: Playing Wreckfest, a 3D racing game

Further limitations arose from the game itself. Game testing helped to identify which keys are needed for independent play and what options are available for using inclusive controls. These can vary depending on the game because the integration of accessibility differs greatly. The game is available on steam, which simplifies the design process because the steam controller overlay makes it possible to use many different controllers. The playtest revealed: It is important that at least 4 buttons plus the directional buttons can be used simultaneously, so the game can be played with only this controller and so without the need of help.

JUNE (they/them):	• Problem solver • Handcrafting skills + Game designer • Programming skills (C#, Engine Work)
FATEMEH (she/her)	• Programming skills (Java, C#, SQL) • Problem Creator :) • Microcontroller
MOHAMAD (he/his):	• Problem solver + creator • Programming skills (powershell, python and C) • Drones
RIA (she/her):	• funny • Presentation and Documentation • Prototyper + Designer
VICTORIA (she/her):	• creative and Prototyper • out of the Box thinking • programming (Java,C#,C++, QML, JavaScript, HTML, Css)
Team skills	
Who is all on the team?	
Who has what superpower or can do what particularly well?	

Figure 10: Excerpt of the Team Miro Board about Team skills

The framework in which the project took place also posed a challenge. Within a few days, people who had never met before had to work closely together to realize a project, they have little experience with. In order to get to know each other quickly, the skills of each individual teammember were identified so that tasks could be distributed and team goals set according to existing capacity. In addition, a plan was developed in which common goals were updated daily.



Figure 11: Testing the motion range of the user



Figure 12: Testing the push force of the user

Practical tests were conducted to understand the user's needs (Figure ???). One of these tests was designed to help determine the user's maximum comfortable range of motion. This was to determine how large the steering wheel needed to be and also the range of motion, that would be needed to change directions. Another test shows the strength of the user's pushing force (Figure ???). This gave an impression of the forces that the material was exposed during play.

To assure, that the buttons are easy to use for the user, several options were tested. The options were validated according to their usability and how well they fit the design. Inspired by real car buttons it was decided to add the additional buttons in the middle of the wheel. Regarding the individual design, it was clear, that there were 3D prints to be done.

It was also important, to check the momentarily setup of the user. This made it more clear, how to fit the accessible controller in home setup.

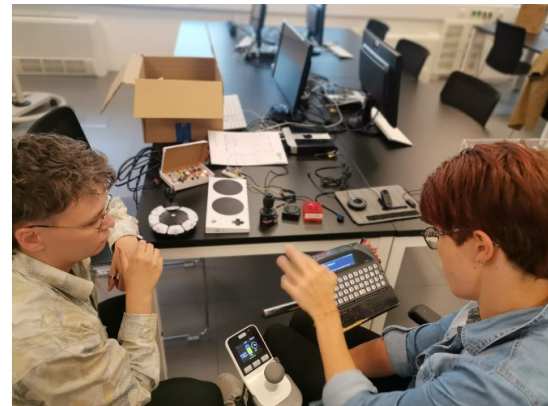


Figure 13: Key button testing and design research

The Research

3.3 The Plan

The necessary parts and construction steps were recorded as shown in Figure 1. The next step was to sketch ideas and engage in mutual exchange. The basic idea was to design the steering wheel similar to a real steering wheel. A used steering wheel from a small car was to be used to save construction time and costs and to convey a realistic feel.

To be able to playtest a steering wheel from xbox was purchased. This should also help to understand the needs of the user and how gaming steering wheels are usually produced



Figure 14: Plan for every construction part of the steering wheel



Figure 15: Teammembers sketching and exchange ideas

3.4 The Wheel

The wheel was reused from an old car. This made the wheel realistic but also very robust because it was made of metal. To enhance the grip a knob was added to the wheel. This makes sure, that the user has a fixed grip and on the same time is able to rotate the wheel. The wheel was mounted on a metal rod, which was supposed to move through ball bearings.



Figure 16: Testing the steering wheel with the knob



Figure 17: The wheel and the metal rod with welded plate

3.5 The Sensor and Electronics

Validating Options

Building a strong enough wheel that withstands the users forces without breaking comes with certain technical challenges. One big challenge was to precisely measure the movement of the newly buildt wheel and converting this information into digital impulses that trigger the correct actions in the game. Without a reliable measurement system, the game would not have reacted correctly. After a brainstorming session, in which different measurement possibilities where collected, several prototypes where built to test the ideas in practice.

MCU Sensor with 6DOF

The MCU Sensor provides a six degrees freedom in movement and was planed to be attached to the wheel directly. The advantage of this solution was, that this sensor required **no direct mechanical connection** and delivers a large number of different outputs (acceleration, angular velocity, tilt). The MCU seemed like a flexible and modern option to use, but tests with a self-built GUI have shown significant and constant calculation errors. The wheel “zero point” was never recognized exactly. Attempts to resolve these errors by integrating mathematical filters into the programming logic helped partially, but the solution remained unreliable: after stronger movements or swings, the system had to be recalibrated and the values often drifted over time. The effort needed to correct the data was quite high. This made it clear that this variant was not robust enough in practice.

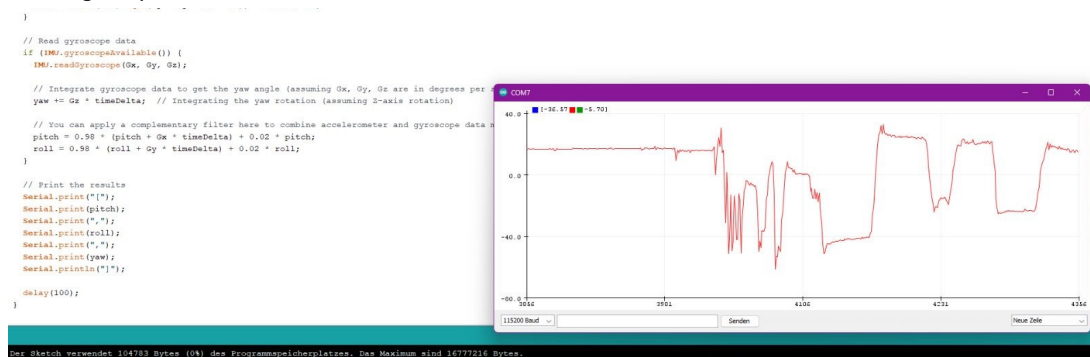


Figure 19: GUI shows significant calculation errors

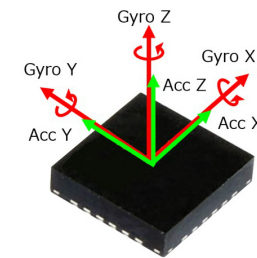


Figure 18: IMU, gyroscope and accelerometer

Light Sensor

The idea was to place 20 light sensors on the inner frame of the wheel. The sensors would detect the current position or direction of the wheel by capturing individual points. The advantage was that this provided a relatively direct and simple digital measurement without complex calculations. One arising problem was, the enormous effort required for constructing. Each sensor had to be mounted and wired precisely, which would have taken a lot of time and precision. In addition, the resolution was limited to 20 measurement point which leads to a low accuracy. The failure of a single sensor would result in only very distorted values being received or the entire system becoming unusable. This sensor was also not the solution.

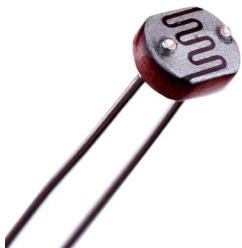


Figure 20: Light Dependent 5528

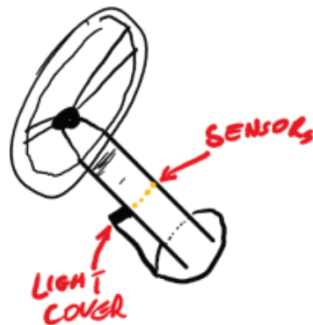


Figure 21 Scetch of steering wheel

Potentiometer

The potentiometer would be directly coupled to the wheel. Implementing the sensor is simple and the position of the wheel can then be directly by the resistance, which changes continuously as the wheel moves. This results in a direct measurement of the current position. The major disadvantage is the mechanical load. Assuming the user moves the steering wheel too abruptly, the entire force would hit the potentiometer and, in the worst case, break it or make it inaccurate. This was at first a reason to not use this sensor, but by time a mechanism was developed to take the force off the potentiometer, so it would not have to withstand the force directly. This made the sensor a simple, reliable and stable solution.

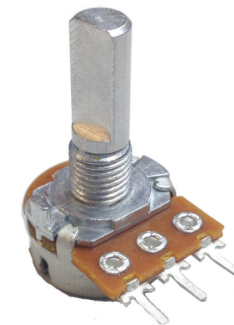


Figure 22: Potentionmeter

Use of the Xbox Wheel Board

Reusing the circuit board from the Xbox wheel saved valuable time. This decision was also advantageous because it allowed existing points to be used after removing the original ones. Furthermore the board already had a potentiometer mounted, which could be used for the new steering wheel. The PC is also automatically recognizing the board as an Xbox controller, because the official Xbox driver is already installed, which makes it easy to use for many different games. This saved capacities that would otherwise been used for complex work of programming a driver that would interpret the inputs as keyboard keys. It also avoided the risk of games detecting the inputs as “cheats” and banning the user from play.



Figure 25: Wheel with and without mouse

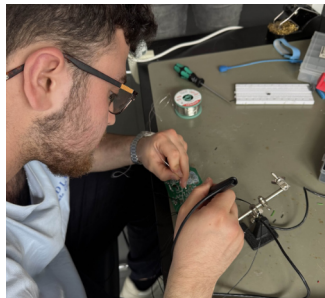


Figure 26: Work on connecting electronics

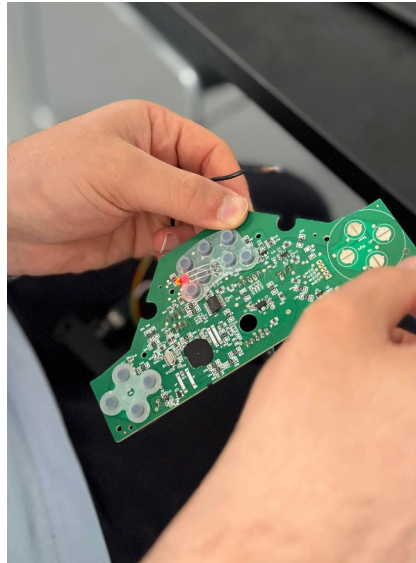


Figure 23: Circuit Board of Xbox Steering Wheel

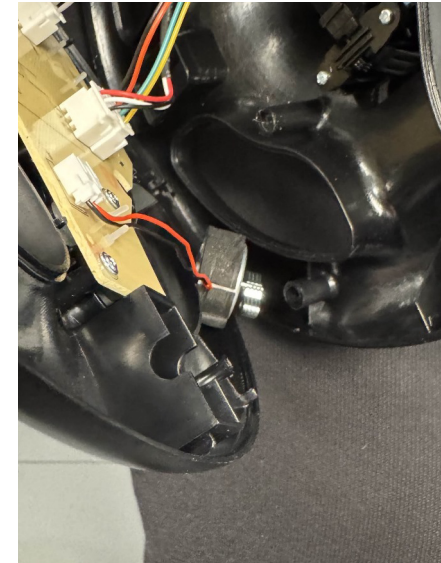


Figure 24: Xbox Steering Wheel with built in Circuit Board

Integration of Addition Buttons

To be able to play the game without the help of others, it was important to integrate additional buttons that would be recognized in the game as additional keys. These were meant to be placed in the center of the wheel and the goal was to make it comfortable for the user to press and approach them. After tests it was decided to use a mouse for this purpose which comes with two buttons.

To access the electronics of the mouse without damaging the actual buttons, the mouse was opened with heat and the unnecessary hardware was removed. The relevant pin contacts and GND were measured and tested and connected to the Xbox mainboard.

Buttons for Acceleration/Breaking

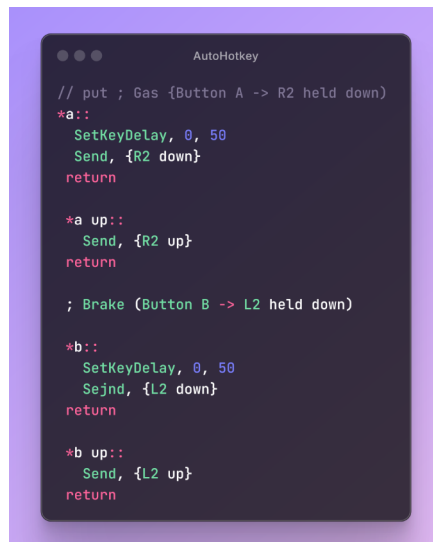
Two buttons for acceleration and breaking had to be constructed as a switch button. The usual buttons for acceleration and breaking work by holding them as long as they should be triggered.

However the user demands an alternative solution.

The user will use their knees to activate and deactivate acceleration and breaks. To make it more comfortable it is important to use a switch button that activates when pressed once and deactivates when pressed the second time.

The game did not support such a function so another software had to be used: “Auto-Hotkey” (by Gray, S.; Mallett, C.; <https://www.autohotkey.com/>)

The following setup was used for this project:



```
AutoHotkey

// put ; Gas {Button A -> R2 held down}
*a::
    SetKeyDelay, 0, 50
    Send, {R2 down}
    return

*a up::
    Send, {R2 up}
    return

; Brake {Button B -> L2 held down}
*b::
    SetKeyDelay, 0, 50
    Send, {L2 down}
    return

*b up::
    Send, {L2 up}
    return
```

Figure 27: Script for AutoHotKey



Figure 28: Steering Wheel with integrated electronics and sensors

3.6 The Case

The wooden material was chosen to contribute to the stability of the steering wheel. The inner case was cut out of thick multiplex wood. The outer case was made out of thinner multiplex wood that had a hardened furnish to be more stress resistant. The design had to be made to fit the inner parts of the steering wheel, while providing a modern look.

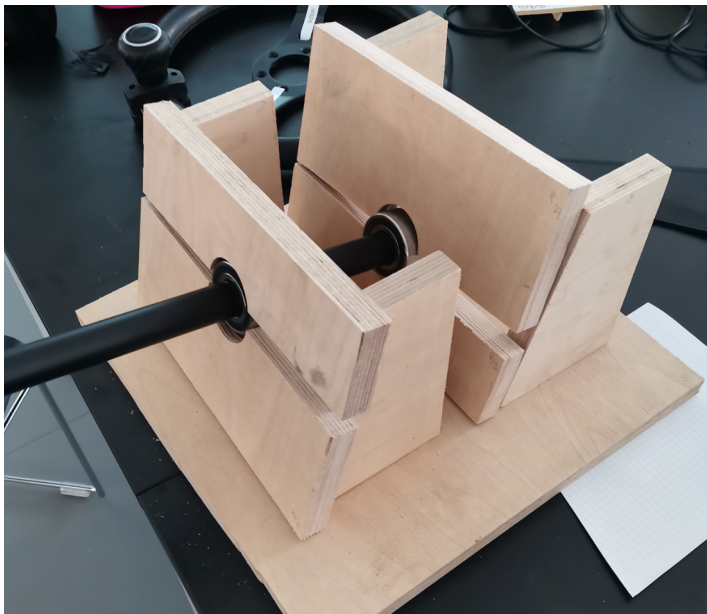


Figure 29: Inner case with ball bearings

self



Figure 30: Cutting the inner case out of multiplex wood

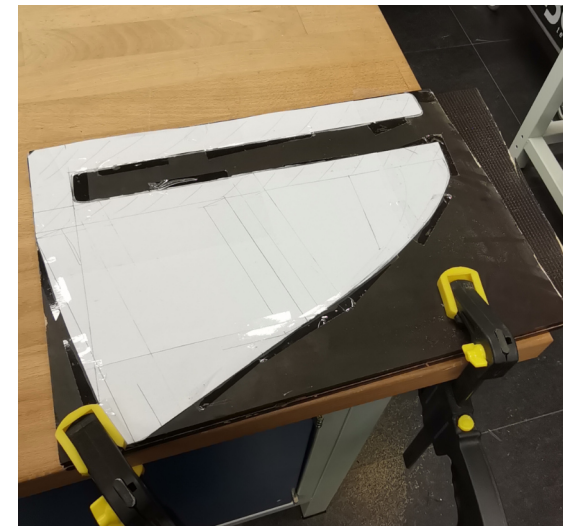


Figure 31: Outer case measures are transferred by paper onto the wood

3.7 The 3D Print

Regarding this projects there where two 3D prints to be designed. One was to hold the mouse in place in the middle of the wheel and the other to connect the sensor to the steering rod.

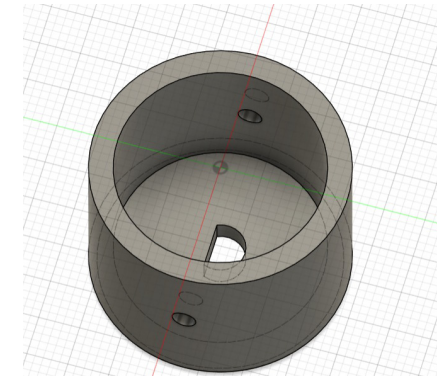
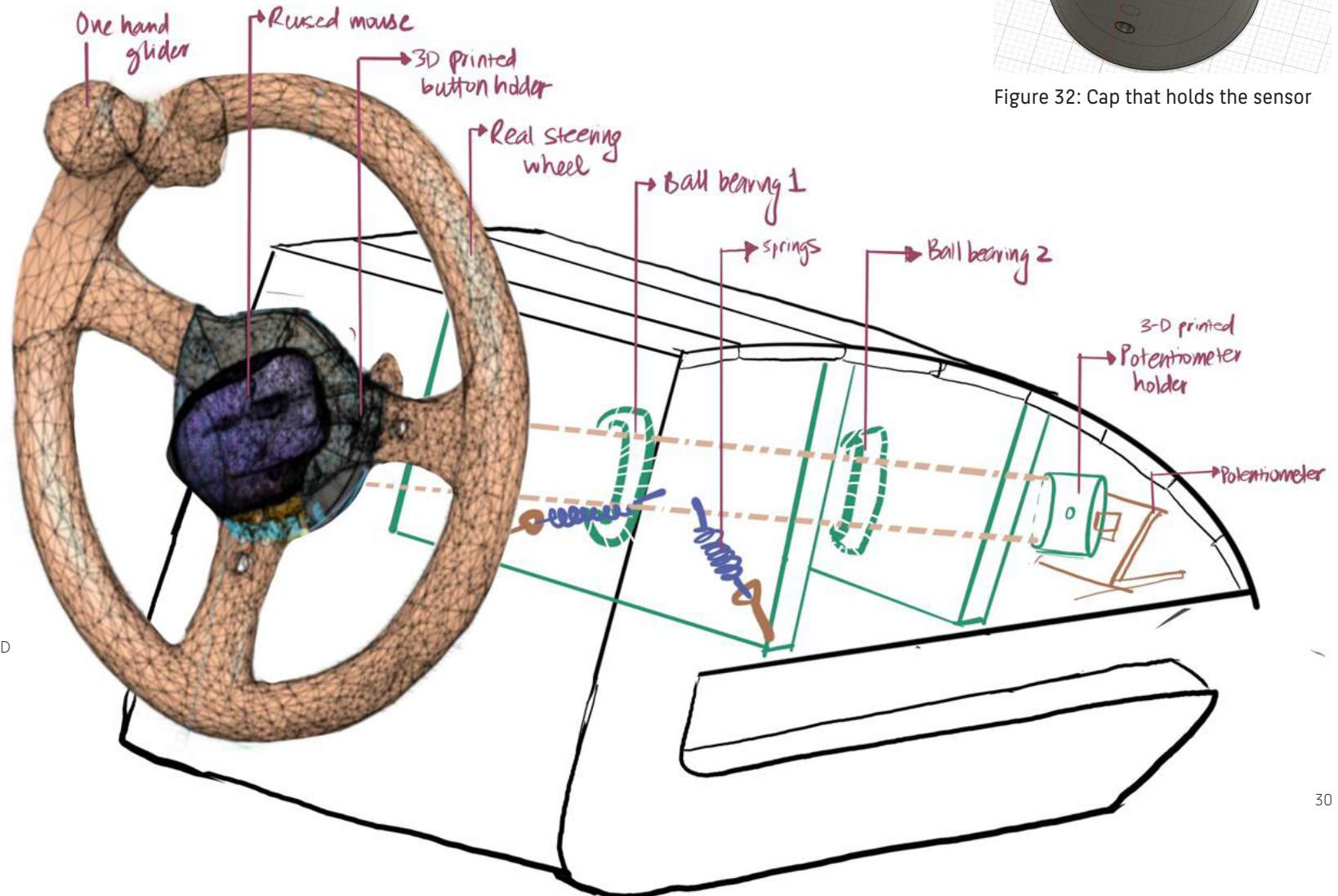


Figure 32: Cap that holds the sensor

Figure 32: Full Sketch with 3D Print design of the mouse mounting case

3.8 The Learnings

The results of this project are impressive, and the team members are proud of what was achieved in such a short time. The lessons learned apply to future projects, rather than how things could have been done differently.

In general, this project was helpful proving that it is possible to build an individual controller within a limited time with limited resources. For the process it is important to have advanced tools that allow quick but precise work, as well as the willingness to learn rapidly as the team.

Experience has shown, that plastic is often chosen because of weight purposes but is not as robust. If other materials are chosen, it should be thought of the weight for every part of the build because wood and metal makes the controller heavy very fast.

The biggest issue in this project was the short time frame. The project was a large one that would have normally taking at least a month of work. It also would have helpful to build different prototypes to explore options for the user. The result is working but very much an early on prototype that lacks alternatives. Communication is key. The project missed on experience but also on communication. There was no overall plan from the beginning due to the reasons mentioned above. Nevertheless, it was a definitely a learning experience for everyone showing how to manage a challenge with no prior knowledge and when to ask for help.

3.9 Future Ideas

To make the wheel even more realistic and add interactive elements, several ideas could be explored:

- **AI sound integration:** Dynamic feedback through sound effects or voice-based reactions
- **Interactive LED strips:** Visual feedback that responds to speed, turns, or game events
- Screen scanning for **automatic change of input**

To improve usability, the mounting system needs to be redesigned. At present, it cannot be assembled by the user alone, as it requires reaching under the table and tightening small screws. A **self-mountable solution**, combined with a wireless setup, would make it more accessible and user-friendly.

Additionally, the **side controller** could be integrated into the steering wheel, reducing the number of separate components and simplifying overall handling.

3.10 The Team



Starting on left:

June Schwenk, Ria Thapliyal, Vicktoria Denk, Natascha Thoman (Specialist), Peter ?? (Assistent), Mohamad Alrifai, Fatemeh Ghoreyshi

References

FH Technikum Wien. (2025, July 6). *Assistive technology summer school* [Video]. <https://www.technikum-wien.at/en/assist-heidi-summer-school-2025/>

Makers Making Change. (n.d.). *Introduction to adaptive gaming*. <https://www.makersmakingchange.com/s/managed-content-news/introduction-to-adaptive-gaming-MCTSLPGP7CHNA7BPYW XU6KALJA6A>

Wilhelm, S. (2025). *Accessible game engineering – An introduction* [PowerPoint slides]. Unpublished presentation, ASSIST\;HEIDI Summer School.

Denxel. (2020, November 14). *Advantages of Godot over other engines* [Online forum post]. Reddit. [https://www.reddit.com/r/godot/comments/juwlng/advantages_of_godot_over_other_engines/](https://www.reddit.com/r/godot/comments/juwlng/advantages_of_godot_over_other_engines/)

Can I Play That. (n.d.). *Tech reviews*. Retrieved August 20, 2025, from <https://caniplaythat.com/category/tech-reviews/>

UNICEF. (2027, March 3). *Disability is caused by the way society is organized, and not by a person's impairment, UNICEF says*. <https://www.unicef.org/georgia/press-releases/disability-caused-way-society-organized-and-not-persons-impairment-unicef-says>

AbleGamers. (n.d.). *Hori Flex*. Retrieved August 20, 2025, from <https://ablegamers.org/knowledge-base/hori-flex/>

Can I Play That. (2020, August 4). *Game PR and marketing accessibility guide*. <https://caniplaythat.com/2020/08/04/game-pr-and-marketing-accessibility-guide/>

Deinhofer, M., & Veigl, C. (2025). *Adaptive gaming: Accessible computer gaming with special input systems*[PowerPoint slides]. Unpublished presentation, ASSIST\;HEIDI Summer School.

Ellis, B. (n.d.). *One Switch Pulse* [Doc file]. <https://www.dropbox.com/scl/fi/o62npgd8bf8od63xmhqq3/ONE-SWITCH-PULSE-GAMES.pdf?rlkey=6n07ir8bsc64a7jd3pz5bcr4d&e=1&st=thtzk8m8&dl=0>

Wilhelm, S., & Inclusive Gaming. (2025). *Accessible game engineering* [PowerPoint slides]. Unpublished presentation, ASSIST\::HEIDI Summer School.

Deng, Y. (2024). *Inclusive games: Accessible game design for the visually impaired*. *Applied And Computational Engineering*, 37(1), 61–67. <https://doi.org/10.54254/2755-2721/37/20230471>

Oliva-Zamora, M. Á. & Mangiron, C. (2025). *Broken immersion in media accessibility: How barriers disrupt the connection between players with dyslexia and video games*. *Cadernos De Tradução*, 45(Special Issue 2), 1–24. <https://doi.org/10.5007/2175-7968.2025.e106678>

Oliva-Zamora, M. Á. & Mangiron, C. (2025). *How to create video games with cognitive accessibility features: a literature review of recommendations*. *Universal Access in The Information Society*. <https://doi.org/10.1007/s10209-025-01231-5>

IGDA Game Accessibility SIG. (2019, 7. Juni). *On Auditory Disabilities - IGDA Game Accessibility SIG*. <https://igda-gasig.org/get-involved/sig-initiatives/resources-for-game-developers/sig-guidelines/on-auditory-disabilities/>

List of Figures

Figure 1

Cover page [Photograph]. Self-taken.

Figure 2

The screen shows: “Want to play without help” [Screenshot]. By Ria Thapliyal.

Figure 3

Presentation at ASSIST\;HEIDI [Photograph]. By Florian Ellinger.

Figure 4

ACCESS Design Compass [Diagram]. By Alice DiPinto.

Figure 5

Settings to reconfigure inputs with HID Remapper Tool [Screenshot].

Figure 6

Natascha says: “Want to play without help” [Photograph]. By Ria Thapliyal.

Figure 7

Testing the IMU sensor [Photograph]. By Fatemeh Ghoreyshi.

Figure 8

Examining a steering wheel [Photograph]. Self-taken.

Figure 9

Playing *Wreckfest*, a 3D racing game [Photograph]. By Fatemeh Ghoreyshi.

Figure 10

Excerpt of the team Miro board about team skills [Screenshot]. Self-taken.

Figure 11

Testing the motion range of the user [Photograph]. By Fatemeh Ghoreyshi.

Figure 12

Testing the push force of the user [Photograph]. Self-taken.

Figure 13

Key button testing and design research [Collage, Photograph, Screenshot]. Self-taken & Fatemeh Ghoreyshi.

Figure 14

Plan for every construction part of the steering wheel [Screenshot]. Self-taken.

Figure 15

Team members sketching and exchanging ideas [Screenshot]. Self-taken.

Figure 16

Testing the steering wheel with the knob [Photograph]. Self-taken.

Figure 17

The wheel and the metal rod with welded plate [Photograph]. By Vicktoria Denk.

Figure 18

IMU, gyroscope, and accelerometer [Diagram]. Schearo. [<https://www.schearo.com/>](<https://www.schearo.com/de/pd.jsp?recommendFromPid=0&id=53&fromMid=682>)

Figure 19

GUI shows significant calculation errors [Screenshot]. By Mohamad Alrifai.

Figure 20

Light dependent 5528 photosensitive resistor [Photograph]. AnyPCBA. [<https://www.anypcba.com/blogs/electronic-component-knowledge/understanding-light-emitting-resistors-when-resistors-glow.html>]

Figure 21

Sketch of steering wheel with light dependent sensors [Screenshot]. By Mohamad Alrifai.

Figure 22

Potentiometer [Photograph]. Build Electronic Circuits. [<https://www.build-electronic-circuits.com/wp-content/uploads/2015/11/potentiometer.jpg>]

Figure 23

Circuit board of Xbox steering wheel [Photograph]. By Mohamad Alrifai.

Figure 24

Xbox Steering Wheel with built in Circuit Board [Photograph]. By Mohamad Alrifai.

Figure 25

Wheel with and without mouse [Photograph]. By Mohamad Alrifai.

Figure 26

Work on connecting electronics [Photograph]. By Fatemeh Ghoreyshi.

Figure 27

Script for AutoHotKey [Screenshot]. By Fatemeh Ghoreyshi.

Figure 28

Steering wheel with integrated electronics and sensors [Photograph]. By Fatemeh Ghoreyshi.

Figure 29

Inner case with ball bearings [Photograph]. Self-taken.

Figure 30

Cutting the inner case out of multiplex wood [Photograph]. Self-taken.

Figure 31

Outer case measures transferred by paper onto the wood [Photograph]. Self-taken.

Figure 32

Cap that holds the sensor [3D Render]. By Ria Thapliyal.

Figure 33

Figure 32: Full Sketch with 3D Print design of the mouse mounting case [3D Render]. By Ria Thapliyal.

Acknowledgments

Acknowledgments

I would like to thank every Instructor at ASSIST:HEIDI for the guidance and support throughout the course.

Special thanks to my project team, whose collaboration and ideas made this work possible. I am grateful to every participant and colleague who shared their perspectives and enriched my understanding of accessibility.

This project would not have been possible without the encouragement of my peers and the inspiring discussions during the course.

I would also like to thank the Technikum Wien for providing the opportunity to engage deeply with the topic of accessibility.

