
Designing Video Games for People with Motor Disabilities

AHS CAPSTONE Spring 2023, SeungU Lyu

The definition of users with motor disabilities is those who have difficulty using fingers/hands/arms, and thus have difficulty using the keyboard, mouse, or gamepad which are the main ways to interact with video games.

The levels of disability can vary, and the amount of control performed by each user can be very different based on their conditions. It will be hard to create a game design that will account for everyone, but it will be important to be aware of requirements that will enable larger audiences.

The game design mustn't "just" aim for people with motor disabilities – This particular aim can undermine what the users can do and create a game that loses the video game's main purpose: fun. It should be widely available, and enjoyable by a wide range of audiences, but encompasses accessibility features on the foundation level.

Requirements

1. Key Remapping (A)

By allowing for complete key remapping, users with limited keyboard or gamepad access can have an improved experience. For instance, individuals who are unable to reach all keys can remap keys within their reach.

Key combination remapping can also reduce the number of keys/buttons required. For example, the "SHIFT + W" combo can be remapped to a single "Arrow UP" key. Likewise, the "Left Trigger" button can be remapped to the "A+B" combination, enabling users with finger-bending issues to utilize the trigger key in a different way.

It is important to avoid hardcoding keys, such as an ESC key for opening the menu, without offering the option to remap it. Failure to do so can lead to users becoming stuck on a screen until they can receive assistance.

2. Simplified Interactions (B)

To maximize fun even with the minimum interaction, it is best to avoid common gaming techniques that require intense control or button clicks but do not add much fun. Instead, enable key or action

toggle, allowing users to avoid holding down buttons or key smashing. Providing options to choose the hold-button time for actions can also improve the user experience.

It is best to avoid actions that require precise or vigorous button presses, such as Quick Time Events (QTEs) or tilting the lever at exact degrees, or offer options to skip or perform them automatically. Likewise, avoid motion controls that require large physical movement, such as shaking.

To reduce the number of keys required, consider adding assist features or implementing automatic features that can greatly help. For example, side weapon attacks can be set to trigger automatically, allowing users to focus on fewer tasks. Implementing an automatic combo mode that performs complicated actions with just a single key can also be helpful. It is best to design games that are possible to play with only one analog stick, just a mouse, or just a keyboard if the user needs it. Additionally, aim support or auto-target can greatly improve the user experience, as well as automatic camera adjustment.

3. Choice of Input Device/Sensitivity (C)

To improve user experience, it is important to provide users with the choice to select between different input devices, such as a mouse, keyboard, controller, or their own input devices. Additionally, providing the option to change the sensitivity of controls can allow users to customize the experience to their preferences. It is also important to offer the option to turn off the vibration (rumble) feature, as some users may find it distracting or uncomfortable.

4. Difficulty Options (D)

To cater to users with different abilities, it is important to provide different difficulty options that allow users to adjust the level of controls required. Offering different difficulty levels can give users the flexibility to choose the amount of challenge and enjoyment they want from the game.

It is also essential to consider that certain games may be impossible to play in certain situations. To address this, providing different difficulty options for different content, such as easy combat and challenging puzzles, can be helpful.

Giving users the option to change the speed of the game as a whole can also be beneficial to multiple types of disabilities, although it is a relatively rare option in video games. It is also important to allow users to pause the game at any time or make the game turn-based, enabling users to choose to avoid real-time interaction.

Existing Approaches

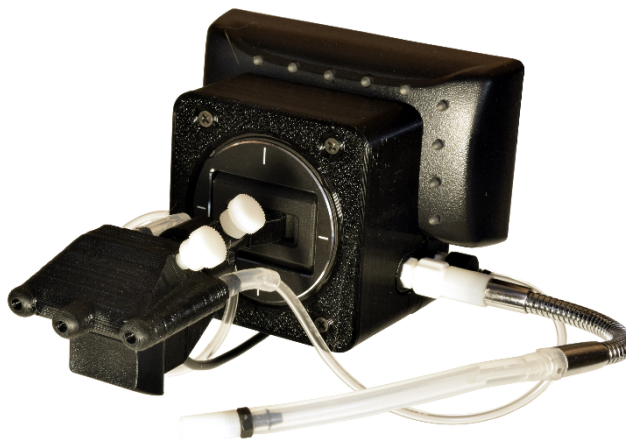
1. Devices that aid control

A. [Xbox Adaptive Controller | Xbox](#)



The Xbox Adaptive Controller is a specially designed controller that caters to gamers with limited mobility. It functions as a hub that allows users to customize their interaction with video games according to their unique needs. In addition to the ability to remap keys on the controller itself, the device also allows users to connect multiple additional devices to add controls that they may need. This makes it an impressive approach for those with motor disabilities as it provides a suitable input device and allows for extensive customization. The Xbox Adaptive Controller is also reasonably priced at \$99, which is relatively affordable for an accessibility device.

B. [QuadStick](#)



The QuadStick is a specially designed controller for quadriplegic users, allowing them to play various types of games using only their mouths and completely hands-free. The controller features a joystick, sip/puff pressure sensors, and a lip position sensor that can be assigned to any controller button, mouse movement, or keyboard key. The device is an impressive invention, and video footage of gamers using it only adds to its impressive capabilities. However, the price point of the device and mounting arm kit is a concern, with the device itself costing \$549 and mounting arm kits starting from \$100+. Nevertheless, given the advanced technology involved and the limited production size, this price point may be reasonable.

C. [VoiceAttack - Voice Recognition for your Games and Apps](#)

VoiceAttack is a software designed to help gamers set up voice commands as extra controllers for their games and applications. With this program, users can assign a voice command, such as "Attack," to trigger a key or execute a defined macro to control their character in the game. This feature is particularly useful for replacing complicated game commands with the user's voice, providing support for users with motor disabilities. While it may not be practical to solely use voice commands to play games, this feature can be a helpful addition. VoiceAttack is a cost-effective option, priced at only \$10, making it an affordable alternative to more expensive devices that can cost hundreds of dollars.

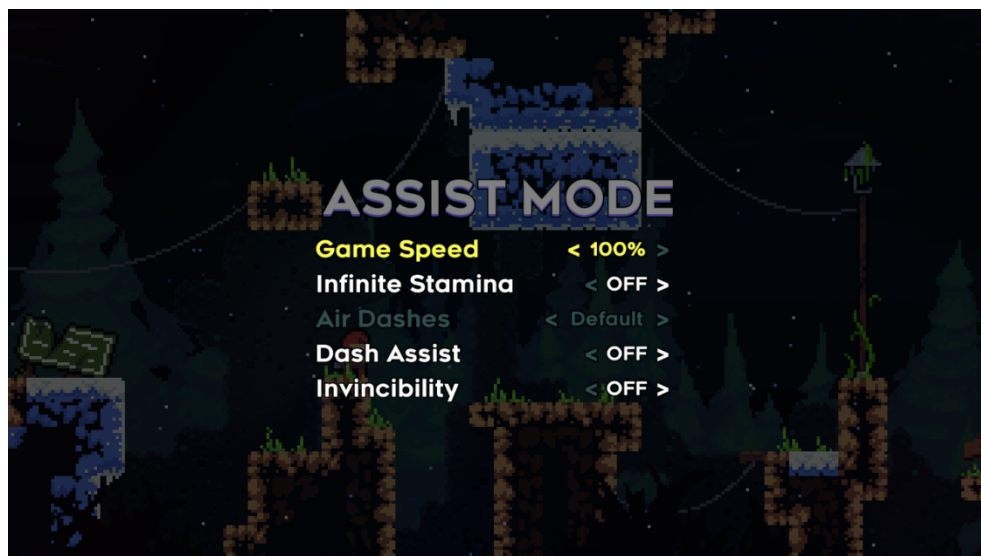
D. [Single-Handed Xbox One Controllers](#)



These controllers have been specially modified for single-handed use on the Xbox One. The controller's keys have been remapped to suit the needs of users who only have the use of one hand. While the majority of games are compatible with this controller, it can be quite expensive, with a price point of around \$350.

2. Games with Accessibility Features

A. [Celeste](#)



Celeste comes with a full "Assist Mode" feature which helps users turn on/off helpful options, and control the game speed.

B. [Shadow of the Tomb Raider](#)

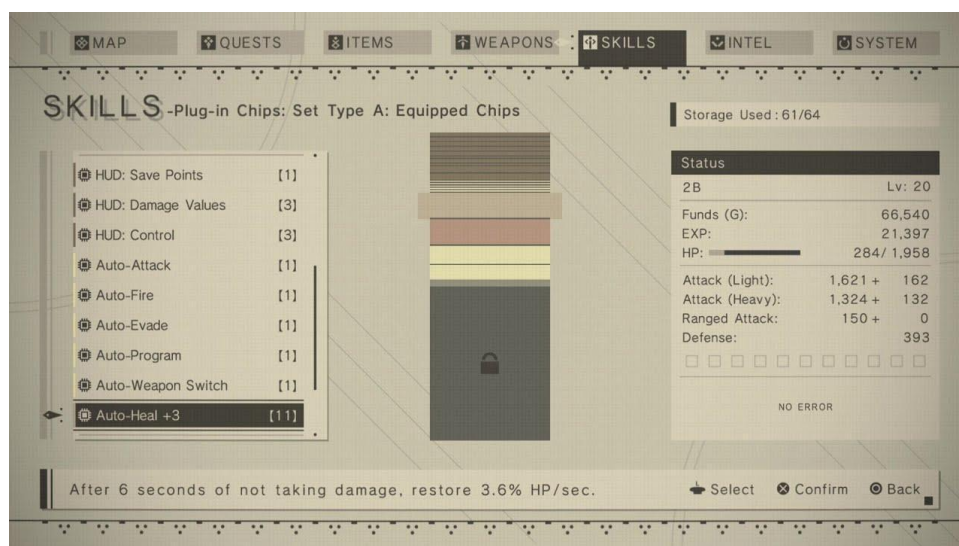


The game comes with difficulty options where users can choose the difficulty of each content. This enables users to fit the game to their needs further.

C. [The Witness](#)

The game has a very interesting feature – instead of moving the characters with analog sticks or a keyboard in the 3D world, you can toggle the option to move the characters with a mouse click.

D. [NieR:Automata™](#) / [BAYONETTA 2](#)



While the games themselves aren't totally accessible, both games have a feature where equipping certain items will allow the users to make auto attack/auto combo, so that people who are not used to action games can also play the game.

E. [The Last of Us Part II](#)



The Last of Us Part II is a video game that has an extensive set of accessibility features, making it one of the most inclusive games to date. The game has implemented over 60 different settings, and the developers put a great effort into making it accessible to a wider range of players. It can serve as a valuable example for other game developers to follow when striving for inclusivity in their own games. You can check out the accessibility options on the official PlayStation website under "[The Last of Us Part II - Accessibility \(US\) \(playstation.com\)](#)".

3. Games With Simple Interaction

A. [Reigns](#)



Reigns is a fascinating game that showcases how simple interactions can still create a captivating gaming experience. The game involves only two actions: swiping left and swiping right. I found it impressive that a game with such a minimalist interface could be so engaging. The [GDC Vault - The](#)

[Casual \(but Regal\) Swipe: Creating Game Mechanics in 'Reigns'](#) offers further insight into the game's mechanics and design.

Key Learnings

1. Reduce the number of interactions required, and avoid the need for precise control.

By reducing the number of interactions required and avoiding the need for precise control, games can become more enjoyable for everyone. Automatic/assist features can also help minimize the interactions required while still maintaining the fun of the game. Buttons should be clearly labeled with the actions they perform and should not require complicated combinations of keys. Turn-based games can also be a good option for those who struggle with real-time interaction and require more precise controls.

2. Make the game completely remappable, and support multiple input devices.

Make every possible key remappable, without exception. To cater to different user preferences, provide multiple UI/touch layouts for touch-based games (e.g., mobile games) and ensure that touch options are visible and large enough to prevent errors. Furthermore, offering support for various input devices is crucial as some players may require specialized gaming equipment.

3. Provide options that users can adjust to fit the game to their needs.

Offering a range of difficulty options can greatly improve the user experience, making a game that was once unplayable now enjoyable. It's also important to provide more specific difficulty settings that allow users to adjust the complexity of individual game features according to their needs. For instance, someone with a motor disability may want to decrease the difficulty of movement but not necessarily the puzzle-solving aspect of the game. Including options that enable the user to control game speed or grant special features, such as infinite stamina, can also be beneficial for certain types of users.

4. Hardware devices are a great approach, but sometimes they are a bit pricey.

While hardware devices can be a helpful approach to accessibility, they may not be accessible to everyone due to their cost. Therefore, it is important to design games that are accessible without the need for additional hardware. This research should take into account the needs of users who may not have access to these devices.

Design 1: 2 Choice RPG

1. Design Mockup



Parcel B
Forest
Difficulty 5



Day 65: Old Man In the Forest

An old man is walking alone in the forest, deeply hurt. You glare into his eye as you pass by, thinking that you heard a small murmur that said, "help..."

I have a
potion, this
might help
him a little
bit

Leave that
man, I have
a long way
to go



Harry



Peter



Justin

Parcel B
Forest
Difficulty 5



Day 65: Old Man In the Forest

An old man is walking alone in the forest, deeply hurt. You glare into his eye as you pass by, thinking that you heard a small murmur that said, "help..."

"How nice of you," said the old man. He looks much more relieved. In exchange, the old man takes out a bright stone that he said he picked on the way, and the stone looks like it is fully filled with the energy of fire



Harry



Peter



Justin

Parcel B
Forest
Difficulty 5

Karma Neutral

Day 65: Old Man In the Forest

An old man is walking alone in the forest, deeply hurt. You glare into his eye as you pass by, thinking that you heard a small murmur that said, "help~"

How nice of you," said the old man. He

Get New Skill

Fire Ball
DMG 12
DUR 4

Burn 10%

Give Up New Skill

Harry

Peter

Justin

Parcel B
Forest
Difficulty 5

Karma Neutral

Day 66: Battle With Living Rock



Harry

Peter

Justin



2. Concept

"2 Choice RPG" is a roguelike-style RPG game inspired by Reigns, where players make decisions by choosing between two options in a series of events. The game aims to clear a certain number of maps and defeat the final boss.

To do this, players must have a good combination of weapons, armor, accessories, skills, party members, and relics. All game elements are randomized to provide a unique experience with every playthrough. The game session is designed to be around 20-30 minutes, making it ideal for quick gameplay sessions.

3. Key Features

A. Event (B)

Each event in the game consists of a **main dialogue**, **two choices**, and their corresponding **consequences**. A sample event is the "Old Man in the Forest," where the player encounters an injured old man while walking in the forest:

Sample event: "Old man in the forest":

Main dialogue: "An old man is walking alone in the forest, deeply hurt. You glare into his eye as you pass by, thinking that you heard a small murmur that said, "Help..."

- **Choice 1:** "I have a potion, this might help him a little bit"
 - Consequence: "How nice of you," said the old man. He looks much more relieved. In exchange, the old man takes out a bright stone that he said he picked on the way, and the stone looks like it is fully filled with the energy of fire"
 - Consequence: you gain the skill card "Fire Ball"
 - The user is then asked to accept the new skill or not. If accepted but the player already owns 2 skills, you choose to discard one of the skills you already own.
- **Choice 2:** "Leave that man, I have a long way to go"
 - Consequence: "The old man looks at you desperately, but you completely ignore him. Evil influences have affected you, and you have lost Karma"
 - Consequence: Your character loses Karma, thus having more chance to go through "low karma" events.

Events in the game can have various outcomes, which can be influenced by probability or specific conditions. For instance, in the "Old Man in the Forest" event, there's a 50% chance that the old man is a monster, and players will have to fight it if they offer him their potion. If a player has a good party member and their karma decreases due to a choice, the dialogue may change accordingly, such as their companion expressing disappointment. Additionally, events can be interconnected, leading to shared stories and further consequences. A battle is also an event, while there can be no choices at all - a dialogue that says "A wild wolf appeared!" will be enough.

B. Map

Each map in the game is composed of a predetermined number of random events, and in order to progress, the user must successfully navigate through all of them (unless a specific event forces them to transition to another map). Random events are triggered based on various factors, and certain conditions may cause an event to occur (such as maintaining a positive Karma level with an evil party

member).

Upon reaching the end of the map, the user must engage in a boss fight, the successful completion of which will grant them a unique treasure, such as rare items or relics. Following this, the user must choose between two different maps to continue their journey, with the added option of selecting which boss to fight next (maybe just the silhouette).

Maps are characterized by their environment, which could be a desert, grassland, mountain, valley, etc., as well as their difficulty level, ranging from 1 star to 10 stars, which determines the nature of the events and battles encountered by the user. Higher difficulty levels increase the likelihood of acquiring better items and skills but also present more challenging battles. Certain environments may also have additional effects, such as in the case of a snow-covered mountain, where the entire party will gradually lose HP due to the cold.

C. Stats and Level

Leveling up is an important aspect of the game, as it grants additional stats to each character. Each character has its own unique **EXP curve**, which means that different characters require different amounts of EXP to level up. EXP can be gained by participating in events and battles throughout the game.

HP is a crucial stat for survival, as losing all of it can result in permanent party member loss or a game over if the player's character dies. However, in most cases, some amount of HP is automatically restored after each event or battle.

Attack and defense determine the amount of damage a character can inflict on the enemy and the amount of damage a character can withstand, respectively.

Speed is another important stat, as it determines how often a character can act during automatic battles. Characters with higher speed will act more frequently, giving them an advantage in battles.

Karma is a unique stat that can increase or decrease based on the player's actions. This can result in bonuses or limitations to the choices that the player can make throughout the game.

D. Item [\(B\)](#)

When a new item is obtained, the user must choose between it and their current item, taking into account the details of each. It is not possible to keep multiple items of the same type and switch between them.

Weapons and armor both have unique effects on gameplay. Weapons increase the character's ATK value, while armor raises the DEF value. Each weapon or armor can also have a special ability, such

as "this weapon increases damage dealt with fire-type skills by 2x."

Accessories, on the other hand, can increase either HP or Speed and may also have a unique ability. However, the user can only equip one accessory at a time.

E. Skills [\(B\)](#)

Skills are automatically performed during battles, based on the **cooldown** of the skill and the speed of the character. For example, if the cooldown is 10 seconds and the speed is 0, the skill will be cast every 10 seconds, while if the cooldown is 10 seconds and the speed is 30, the skill will be cast every 6 seconds. There will be a graph that controls the skill cooldown and speed relationship.

A character can have a **maximum of 2 skills**, and any further skills they gain should replace the existing ones. The **effect of a skill** can be anything from attacking with increased damage to providing creative effects, such as "granting 1 speed to every party member during this fight." The cooldown of powerful skills is usually longer than that of weaker skills.

F. Relics

Relics are rare and powerful items that grant an effect on every party member or event. Obtaining one is most commonly achieved through defeating bosses. There is no limit on how many relics a user can own, but they can have negative effects on the party. Because of this, the user can choose not to keep a relic as there is no way to dispose of it once obtained. For example, a relic may grant double ATK value to the party, but at the cost of not healing HP after every event. While this may make battles easier, the chance of survival may decrease due to a lack of healing. Another relic may give every new party member an extra 20 levels, but may also prevent the user from refusing a new party member, making it harder to create a balanced party.

G. Party Members [\(B\)](#)

In this game, players are able to recruit up to 2 additional **party members** through events. However, if a party member dies during a battle or event, they are permanently removed from the party. In the event that a new party member is obtained, the player will be given the option to accept them and then choose between two existing party members to replace.

Party members come with their own fixed karma, weapon/armor/accessory, and skills, which cannot be changed by the player. The only aspect that can be altered is the level of the party members. As the game progresses, it is likely that newly recruited party members will come with better gear, but those who have been with the party from the beginning will have higher levels.

H. Battle [\(B\)](#)

In the game, battles can be triggered as a standalone event or as a result of another event. Moreover, there is a final boss fight that must be tackled at the end of every map. During battles, the character's actions are fully automated, with each character having an automatic "standard attack" based on their ATK value and two skills that activate automatically at intervals determined by their skill cooldown and speed stats.

Once an enemy's HP drops to zero, the battle concludes, and the player receives EXP as a reward. As with events, the outcome of each battle can have consequences that affect the player's progress and decisions.

I. UI Design [\(A\)](#)

The journal-style UI design of the game is a unique and creative approach that allows players to feel like they are writing their own adventure story. The layout of the UI is book-like, with each event and battle being a page that the player can turn to. This journal will be available for the player to read again after they have completed the game, making it a fun way to relive their journey.

To further enhance the user experience, the game will come with multiple UI layouts that the player can choose from. This feature will be particularly helpful on mobile devices, as users can find a layout that suits their touch preferences. Overall, the UI design of the game is not only aesthetically pleasing but also adds a unique and enjoyable aspect to the gameplay.

J. Difficulty [\(D\)](#)

To make the game more enjoyable for players of all skill levels, various difficulty options will be available. These options are not directly related to limited mobility users as the game does not require precise controls, but they are a useful feature to have. The game can offer an easy mode for players who are not as experienced with RPGs or who want to focus on the story without struggling through battles. Battles in this mode can have reduced enemy HP or lower damage dealt by enemies. Conversely, a hard mode can be offered for players who want a challenge, where enemies have higher HP or deal more damage.

Additionally, the game can include options to adjust the frequency of battles, with a higher frequency for players who want more action, and a lower frequency for players who want to focus more on exploration and story. An option to turn off events that are especially challenging can also be provided, such as those that destroy items, skills, or party members, or those that permanently decrease certain stats or start extremely difficult battles.

Overall, the different difficulty options can make the game more accessible and enjoyable for a wider range of players, allowing everyone to have a fun and rewarding experience playing the game.

K. Multiple Platform and Input Device Support [\(C\)](#)

To make the game accessible to as many players as possible, it will be released on multiple platforms, including PC and smartphones. This allows users to choose which platform they prefer based on their comfort and accessibility. The PC version will be compatible with any input device that is compatible with the system.

In terms of accessibility features, the game might include sound control support in the future. As the game has a limited number of interactions, it may be possible to enable complete game control based on voice recognition. This can be an added convenience for players who have mobility or other physical limitations, as they can play the game entirely through voice commands.

4. Why Accessible?

Ensuring accessibility is crucial for any game to be enjoyable for as many people as possible. In this game design, accessibility is emphasized in several ways. Firstly, the maximum number of actions required while playing the game will be capped at 2, minimizing the complexity of gameplay. Although certain situations may require additional actions, such as accessing the options menu, efforts will be made to ensure they can be performed easily with just two buttons. Additionally, automatic battles will allow players to focus on the strategic aspect of the game, without worrying about performing complicated actions during battles.

Secondly, the game will offer a remappable touch UI, as well as support for multiple input devices, so that players can choose the best input method that suits their individual needs. The touch UI will be visually intuitive and designed with sufficient size to avoid accidental presses. For those who do not prefer touch-based actions, the game can also be played using the volume +, - buttons. For PC users, key remapping will be supported to allow any input device to play the game without issues.

Finally, the game will feature difficulty options that allow players to define their own level of challenge. This ensures that everyone can enjoy the game, whether they are seasoned RPG players or a newcomer. By providing a range of accessibility features, the game will be accessible to a wider audience and ensure an enjoyable gaming experience for all.

5. Why Fun?

The game is designed to be fun and engaging for players of all skill levels. Its simple RPG mechanics make it easy to pick up and play, while its unique book-like design and randomized events and battles add an element of unpredictability and excitement. Players will feel like they are writing their own travel journal as they make choices and progress through the game, with the option to revisit their past adventures on the bookshelf.

The game's randomized events, skills, items, party members, relics, and battles ensure that every playthrough is different, with consequences that can end your journey or lead you to victory. With a large number of events and unpredictable consequences, even players who have memorized previous events won't be able to assume the outcomes. The thrill of looting valuable items and finding the best combinations of skills, items, and party members to progress through the game adds to the enjoyment.

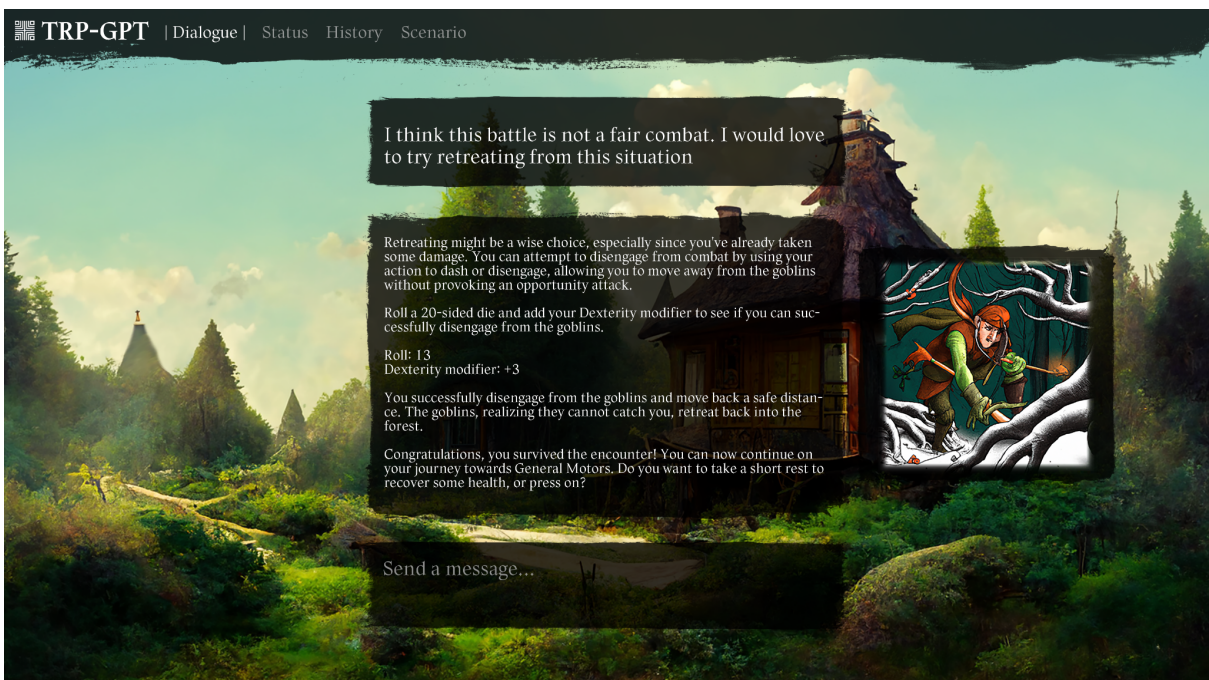
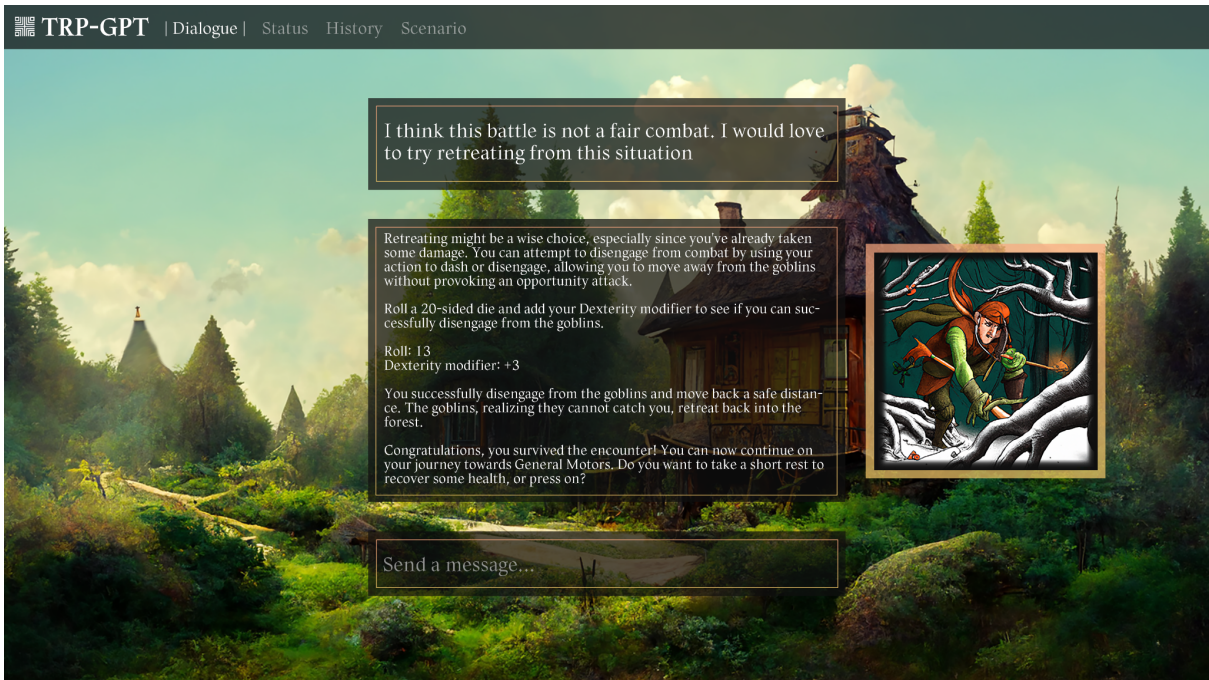
For example, even if players have a powerful item early on, they may need to exchange it for something else later in the game, making every decision a difficult one. Replacing a party member can also be stressful as players will need to consider whether their current combination of party members is optimal or if a new member with better gear is worth the risk.

While battles are done automatically, players still need to think carefully about their choices and the combinations they make to achieve the best possible outcome. The game also offers options for players to adjust the difficulty level to their liking, ensuring that everyone can enjoy the game at their own pace.

Overall, the game's simplicity, unique design, and randomized elements make it a great solution for players looking for a fun and engaging game to enjoy during their commute or a short break.

Design 2: TRP-GPT

1. Design Mockup



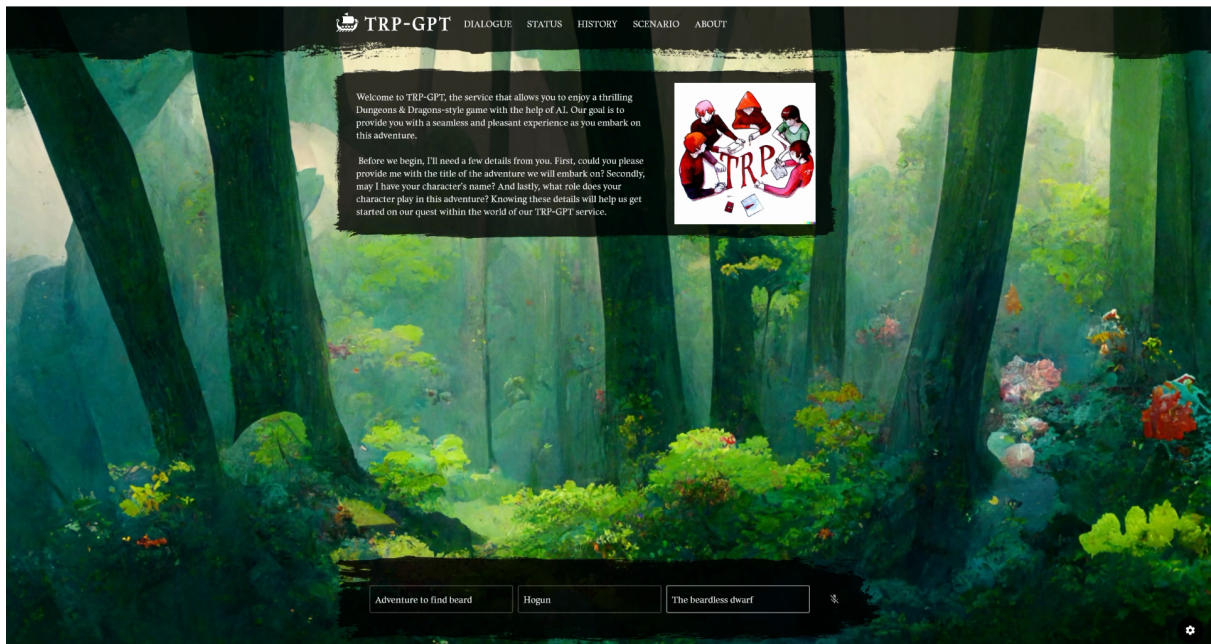
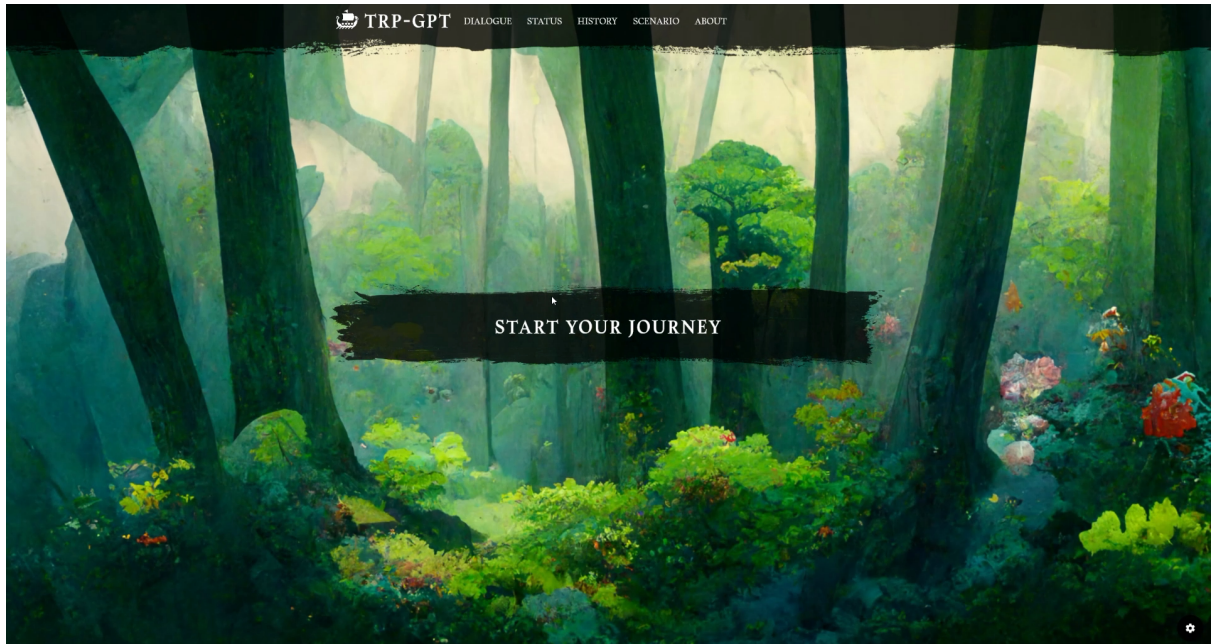
Assets All Created with AI Technology

Background images - [Midjourney](#)

Dialogue - [Chat-GPT](#)

Side Image - [DALLE](#)

2. Prototyping



Welcome to TRP-GPT, the service that allows you to enjoy a thrilling Dungeons & Dragons-style game with the help of AI. Our goal is to provide you with a seamless and pleasant experience as you embark on this adventure.

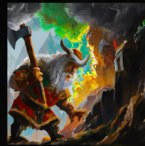
Before we begin, I'll need a few details from you. First, could you please provide me with the title of the adventure we will embark on? Secondly, may I have your character's name? And lastly, what role does your character play in this adventure? Knowing these details will help us get started on our quest within the world of our TRP-GPT service.



Title of the Adventure: Adventure to find beard
Name of Your Character: Hogun
Role of Your Character: The beardless dwarf

Welcome, Hogun, to the world of Dungeons and Dragons. As you set out on your quest to find your missing beard, you find yourself at the entrance of a dark and ominous cave. The air is thick with the stench of sulfur, and the ground beneath you rumbles with the sound of distant thunder.

Ahead of you lies a fork in the path, one leading left and the other right. Which path will you choose, Hogun?



Send a Message

I would love to head toward the right path

As you make your way down the right path, the cave walls begin to narrow and the air grows hotter. You can feel sweat trickling down your forehead as the heat intensifies.

Suddenly, you hear a low growl coming from the darkness ahead of you. As your eyes adjust to the dim light, you see a pack of fire-breathing Kobolds blocking your path.

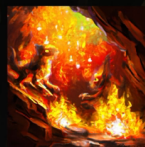
What will you do, Hogun?



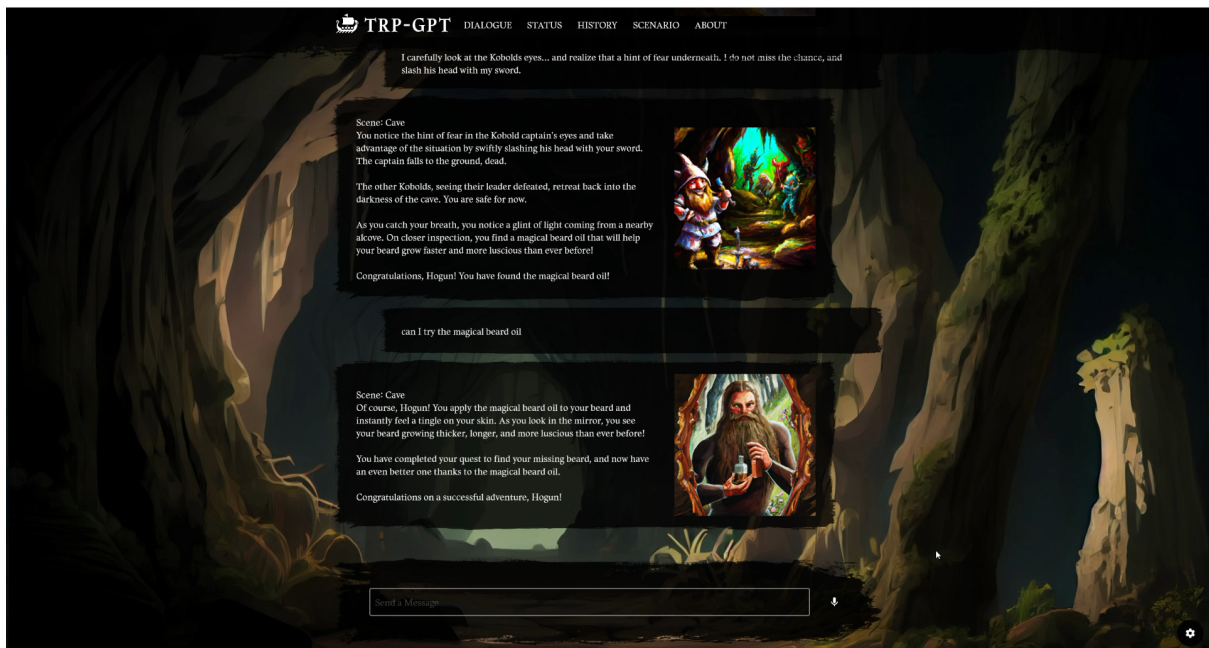
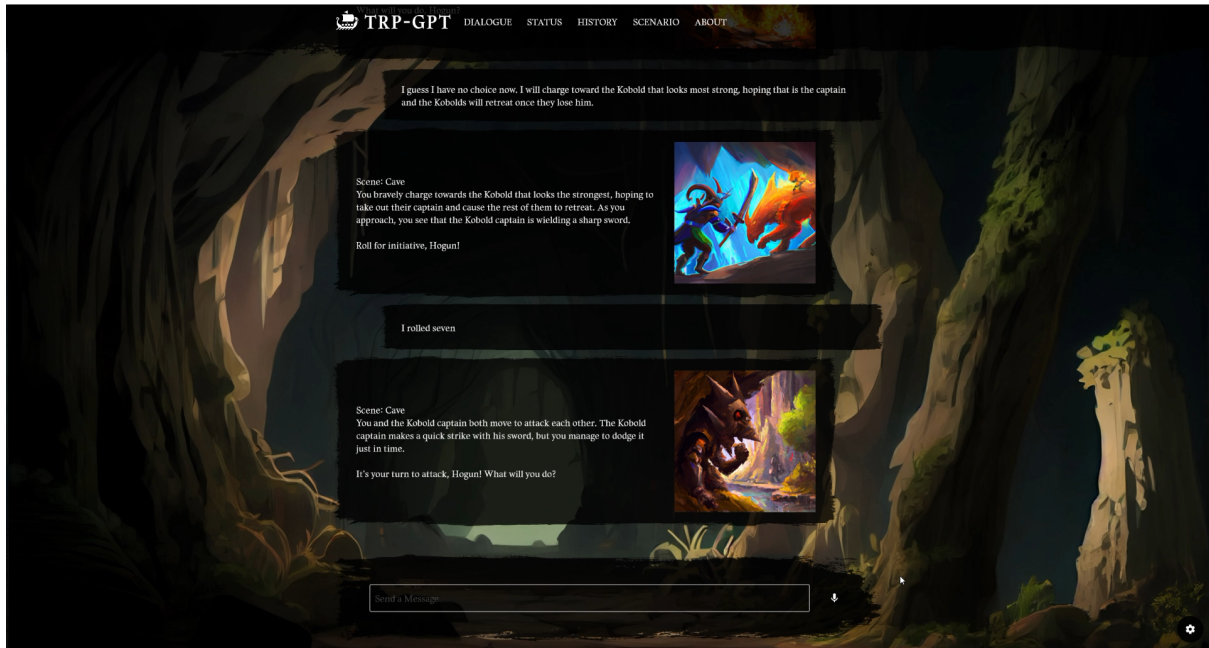
I feel like cobbles have nothing to do in my beard so let me get away from this station

Scene: Cave
You decide to back away slowly, hoping that the Kobolds won't notice you. But unfortunately, one of them spots you and they all start charging towards you, breathing fire.

What will you do, Hogun?



Send a Message



Demo Video as of 2023-04-28: <https://youtu.be/uv9VXMOV6KE>

3. Concept

This concept originated from a casual conversation I had with a friend about integrating AI technology with accessibility features in video games. We saw a tremendous opportunity to provide support for people in need, and I hope our design can serve as a guide for other developers. To test our approach, we aimed to create a voice-only video game that doesn't require any physical movements to play. While there are existing voice-only games, with the aid of AI, we believe the interaction will feel more natural, as if you're conversing with another person.

With the advent of Chat-GPT, we can now simulate a friendly dialogue with AI, and after some testing, it has become apparent that Chat-GPT is capable of playing simple dialogue-based games. By training Chat-GPT with prompt engineering, which feeds in accurate rules and instructions, we can create a more realistic interaction between the AI and the human player. In particular, Chat-GPT has been successful in playing tabletop role-playing games (TRPGs) as the Dungeon Manager (DM), giving instructions to the human player based on the scenario suggested by the AI. This approach allows the user to make choices, such as rolling the dice or suggesting their own pathways, while engaging in fights, similar to other TRPG scenarios.

Prompt engineering is the key to ensuring that Chat-GPT stays on track during gameplay. For example, if the user asks an unrelated question, such as "What is a famous food in Korea?", the AI may provide an irrelevant answer, disrupting the game's flow. Therefore, we must process the user's initial input to ensure that Chat-GPT stays on topic and delivers a more immersive experience.

In addition to prompt engineering, we will integrate multiple AI features into the game, such as "Speech to text," "Text to speech," "Music generation based on the current situation," "AI-generated background image based on the current location in the scenario," and "AI-generated side image based on the current response from the AI." These features will enhance the user's experience by providing more than just text-based interactions with the AI.

Overall, our TRPG dialogue-based game with Chat-GPT as the DM will offer a unique gaming experience for users interested in role-playing games.

The TRP-GPT idea offers a more diverse and dynamic play experience compared to the 2 Choice RPG. With TRP-GPT, you can feed in different scenarios and settings, which can create different play experiences each time. On the other hand, the 2 Choice RPG has a limited number of scenarios and choices, which can make the gameplay repetitive and predictable.

Another advantage of TRP-GPT is its simple interaction, which only requires typing or voice commands. This feature can make the game more accessible to a wider audience, including people with disabilities. TRP-GPT can serve as a good example of how AI can support people with disabilities in playing video games.

We also intended to use various AI-related technologies to showcase how they integrate and form a platform for developers and users to create games with AI-generated assets. However, the implementation of the TRP-GPT game may not reach the industry level due to some limitations, and primarily designed as a showcase. One limitation is the language barrier, as Chat-GPT can only act as a DM in English. Additionally, the game cannot fully replace the enjoyment of interacting with other people, which is a significant part of playing TRPG.

4. Key Features

A. AI DM and Dialogue (B)

AI will serve as the DM for TRP-GPT, generating scenarios and offering users various choices. Players can engage in casual conversations to continue their journey, and the AI will respond accordingly.

For instance, here's an example of a conversation with Chat-GPT:

- **Player Input:** Let's do it! My character's name is Jonanos, a dwarf magician who tries to learn magic but his actual talent lies in using weapons such as hammers. I'm on a journey to the Haliomos, the famous magic academy that is believed to enhance my skills and knowledge.
- **TRP-GPT:** Great! I love the concept of your character, Jonanos. Let's get started! You find yourself on the road to Haliomos, the famed magic academy, as a chill wind blows through the forest. The leaves of the trees rustle in the wind, and you can hear the sound of a nearby stream. As you make your way down the path, you notice a group of bandits up ahead, blocking your way. They look like a rough-and-tumble bunch, armed with swords and axes. "What have we here?" one of them sneers. "Looks like a little dwarf magician. What's your business on this road?" How do you respond, Jonanos?
- **Player Input:** "Hah! Bandits!" As I stare at their absurd face, I realized this was time for me to use my "magic" skills. I draw my hammer out from my back and charge toward the enemies.
- **TRP-GPT:** Your sudden charge catches the bandits off-guard, and they scramble to ready their weapons as you charge toward them with your hammer. You swing your hammer with all your might, striking the first bandit in the face and sending him flying backward. The remaining bandits are momentarily stunned by your ferocity, but they quickly recover and spread out, surrounding you on all sides. One of them takes a swing at you with his sword, but you dodge it with a nimble step to the side. The bandits continue to circle you warily, looking for an opening. What do you do next, Jonanos?

We have tested the AI DM with sufficient background information and storyline to ensure that it can manage a session without any issues. However, one challenge we may face is that as an AI language model, Chat-GPT cannot allow users to engage in unethical behavior, which is sometimes a necessary aspect of TRPG games (such as pretending to be bandits). Further research will be required to determine the exact limitations of an AI language model in this context.

A. Visualization

An important aspect of TRP-GPT is the visualization of the game. In order to make the experience

more immersive, we plan to include background images that correspond to the current location of the player, as well as small images that depict the current situation. With the help of AI technology, creating visual representations of different scenarios is easier than ever.

To achieve this, we plan to use Chat-GPT to generate descriptions of the player's surroundings, such as "Forest Road, near Magic Academy." We can then use this information as keywords to generate relevant images that help to immerse the player in the game world. This will provide a more engaging and enjoyable experience for players, helping them to better visualize their surroundings and the situations they encounter. However, we recognize that there are limitations to AI-generated images and that the quality may not be as high as hand-drawn illustrations. We will continue to explore ways to enhance the visual aspect of the game while staying within the constraints of our resources.





- Example background photos initially generated by AI (Midjourney), then edited by [Lornn - itch.io](https://lornn-itch.io)

The platform asks Chat-GPT to provide a brief explanation of the current situation. Based on the response, keywords can be extracted, such as "bandits" and "travelers," which can be used to generate a side image that depicts the current situation. This image can provide users with a visual representation of what's happening in the game and add to the overall experience.



- An AI-generated picture with the input "An Archer retreats from the goblins in the forest"



- An AI-generated picture with the input “Watercolor drawing of people playing TRPG, with the logo TRP-GPT on the middle of the image”



- An AI-generated picture with the input “Oil painting of a dwarf with a hammer, charging toward a group of bandits, striking the first bandit in the face.”

A. Music

To further improve the integration of AI-generated music in the TRP-GPT game, we can also ask for specific musical elements such as tempo, instrumentation, and genre. For example, if the player is

entering a battle scene, we can ask for fast-paced and percussion-heavy music with a focus on brass and strings. Alternatively, if the player is exploring a peaceful forest, we can ask for a slower tempo with a focus on woodwind instruments and nature sounds.

Additionally, it may be beneficial to allow players to customize their own music preferences within the game settings, giving them more control over the musical atmosphere of their gameplay experience. This customization can also be based on the same musical elements previously mentioned, such as tempo, instrumentation, and genre.

By combining the use of AI-generated music with player customization, the TRP-GPT game can provide a more personalized experience for each player.

B. Multiple Input Method & Multiple Platform Support [\(B\)](#) [\(C\)](#)

To ensure that TRP-GPT is inclusive and accessible to all players, it is essential to support multiple input methods. There are two primary ways to interact with the game: **typing** and **voice input**. Typing requires a keyboard or equivalent device to input sentences, but alternative input devices like a mouse or virtual keyboard will also be supported. Voice input will require a microphone attached to the user's device.

TRP-GPT will be available on **various platforms**, including Windows, Mobile, and Web, and can be accessed from anywhere. Players can choose the device that best suits their needs and use their preferred input method to interact with the game. Offering multiple input options not only provides convenience but also allows users with different abilities and preferences to participate fully in the game.

This integration will benefit not only people with disabilities but also enable more players to enjoy the game casually while engaged in other activities such as driving or cooking, although I do not recommend playing the game while engaged in such activities for safety reasons.

C. Speech to text & Text to speech [\(A\)](#) [\(C\)](#)

Accurate voice recognition (with/without the help of AI) is crucial for the TRP-GPT game, as inaccurate input could significantly alter the user's experience. To enable voice-only play, keyword detection is required to filter out irrelevant inputs. For instance, using the phrase "Hey DM!" and a sound signal to indicate the start of a recording could facilitate interaction between the user and the game, similar to how people use Siri. While this approach may not be as seamless as talking with a human, it is necessary to enhance input accuracy. To further improve accuracy, AI technology can be employed in speech-to-text recognition.

In addition to voice recognition, text-to-speech will be incorporated into the game to provide clear

voice feedback on the game's progress. While not strictly necessary for users who rely on visual output, it is an integral part of creating a voice-only game and making the game accessible to a wider range of users (for example, the BVI community). Users will be given the option to turn TTS on or off, as well as to adjust the speech speed for accessibility purposes.

D. Scenario & Rule Suggestion [\(D\)](#)

One of the most exciting features of this game is the ability for users to customize their experience by inputting their own settings, stories, and rules into the AI. This allows for endless possibilities and makes the game enjoyable even after multiple plays, as users can define the world they want to explore and the AI will suggest situations that accurately fit their preferences. This feature allows for a unique and personalized gaming experience, catering to the individual tastes of each user. Additionally, this feature encourages creativity and imagination, allowing users to build and explore worlds of their own making with the help of AI.

E. Multiplayer & Progress Saving

To take the game to the next level, multiplayer functionality will be implemented, enabling the AI to receive inputs from multiple players simultaneously. While not all players may need to respond every time, having more inputs will help the AI model better understand the situation and provide more accurate and engaging gameplay. For instance:

- **TRP-GPT:** As you review the map, you notice that the secret entrance to the Xanathar Guild's lair is located in a nearby alley. The entrance appears to be well-hidden, but you are confident in your ability to find it. What do you do next?
- **Player Input:**
 - A. Dwarf: I think it would be nice to go look for the entrance right away! what do you all think?
 - B. Elf: well we probably need some information. Mind going to the town and asking for help?
 - C. Dragon: WAAHHHGG! We don't need any help. Let's slay whatever we see, and go straight to the lair!!
- **TRP-GPT:** As a DM, I suggest that your group have a brief discussion to come to a consensus on your next steps. It's important to work together and consider all options before making a decision. If you decide to go look for the entrance right away, you make your way to the alley indicated on the map. The entrance is well-hidden, but with your group's collective skills, you are able to locate it. If you decide to gather more information, you could visit

various locations around Waterdeep, such as taverns, markets, or even the city guard. You may be able to gather useful intel that could aid you in your mission. If you decide to charge into the lair without a plan, it could be very dangerous. The Xanathar Guild is a powerful organization, and their lair is likely heavily guarded. You may need to consider how you will handle any opposition you encounter, and what your backup plan would be if things go wrong. So, what would you like to do?

- **Player Input:**
 - A. Dwarf: alright. I agree with Elf. Let's go back to town.
 - B. Elf: yeah I knew you will say that.
 - C. Dragon: are you all serious?? Alright I'll follow you
- **TRP-GPT:** Great, it sounds like your group has decided to gather more information before proceeding to the Xanathar Guild's lair. You make your way back to the city and begin asking around for any information that might be useful.

To enhance the gaming experience, the addition of a progress-saving feature is highly beneficial. This feature will enable players to save their progress on the server, allowing them to resume their game session at any time and from any location. It is especially useful for multiplayer games where players may not be able to complete a session in one sitting. With progress saved on the server, players can leave the game and return to it later, without losing their progress.

5. Why Accessible?

TRP-GPT, a text-based role-playing game, is designed with accessibility in mind. It offers a variety of input methods for users, including typing and voice recognition, to accommodate different needs and preferences. By allowing users to choose the input method that best fits their needs, TRP-GPT ensures that players of all abilities can enjoy the game.

Accurate voice recognition is a crucial feature for TRP-GPT, as it allows players to play the game solely with their voice. For users who cannot rely on visual output, the game offers a text-to-speech option to provide clear feedback on the game's progress. These features enhance the accessibility of the game and make it easier for players with disabilities to enjoy the game.

Moreover, TRP-GPT offers a customizable game experience, allowing users to feed pre-defined settings, stories, and rules to the AI to create their own TRPG-style game. This level of customization means that users can set the difficulty level to match their own skill level and playstyle, making the game more challenging and rewarding. It also allows users to explore the world they want to create and enables the AI to suggest accurate situations based on the user's input, creating a unique and

engaging gameplay experience.

Overall, TRP-GPT's accessibility features and customizable gameplay experience make it a great choice for players of all abilities. The game's focus on accommodating different input methods and providing clear feedback in different ways ensures that players with disabilities can enjoy the game without any barriers.

6. Why Fun?

One of the key features that make TRP-GPT fun is the limitless possibilities of storytelling. With the power of the GPT3 language model, the AI is able to generate unique stories, customized to the user's preferences. Users can input their desired themes, settings, and character descriptions, and the AI will create a world they can explore and interact with. This feature allows users to experience a different story every time they play, making the game endlessly entertaining.

In addition to the limitless storytelling possibilities, TRP-GPT requires less effort than traditional tabletop RPGs. Players can simply type or speak their responses to the AI, and the game will progress accordingly. This means that players do not have to worry about managing character sheets or tracking inventory, as the AI takes care of all of these details. This streamlined gameplay allows players to focus on the story and the choices they make, making the experience more engaging and enjoyable.

The platform also offers a variety of visuals and music that contribute to the overall enjoyment of the game. Unlike traditional TRPG settings, TRP-GPT has the ability to provide AI-generated visuals and music that enhance the gaming experience. From vibrant scenery to engaging soundtracks, TRP-GPT is able to create a world that players can fully immerse themselves in.

Overall, TRP-GPT is fun because it offers limitless storytelling possibilities, requires less effort than traditional tabletop RPGs, and offers visuals and music that match the situation. These features make TRP-GPT an enjoyable and engaging game that can be played and enjoyed by a wide range of users.

Resources

1. [Motor/Physical Accessibility Guide - Can I Play That?](#)
 - A. Set of simple guidelines that lets developers be aware of the requirements for creating accessible games.
2. <https://youtu.be/Ufe0i26DGiA>

- A. Great introduction video with examples, visuals, and explanation about how to make games for people with motor disabilities.
3. [Xbox Accessibility Guidelines - Microsoft Game Dev | Microsoft Learn](#)
 - A. Very detailed guidelines for video game developers, feature by feature with examples, on how to build an accessible game.
 4. [Can I Play That? - For Disabled Gamers, By Disabled Gamers](#)
 - A. A website with reviews on many different video games with a focus on whether the game is accessible or not.
 5. [DAGER System | Video Game Reviews for the physically disabled.](#)
 - A. A second website with reviews on many different video games with a focus on whether the game is accessible or not.
 6. [12 Adaptive Gaming Controllers for Disabled People – LifeZest](#)
 - A. Good examples of devices available for disabled users to aid them in playing video games.