



SPOKEN WORD

Reference and Control Sheet

Spoken Word is a final year undergraduate project by Sebastian Chumaceiro at Queen Mary University of London.

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What is Spoken Word?

Spoken Word is a simple game meant to evaluate the use of voice controls in video games to alleviate challenges faced by users with motor control impairments. Spoken Word and its accompanying research and report also aims to answer the following questions:

1. Do video games improve the lives of the disabled, and if so how?
2. What elements of video games are the most tolerable by people with motor impairments, and what elements are least tolerable?
 - a. What makes a game unplayable by someone with a particular disability, and what are they looking for when purchasing a new game?
3. How can games be best tailored to those with disabilities, without compromising game design or drastically altering the player's experience?

How to Play

Spoken Word is a small game, the objective is simply to complete both tasks currently available to the player, in order to open the metal door visible in Figure 2.

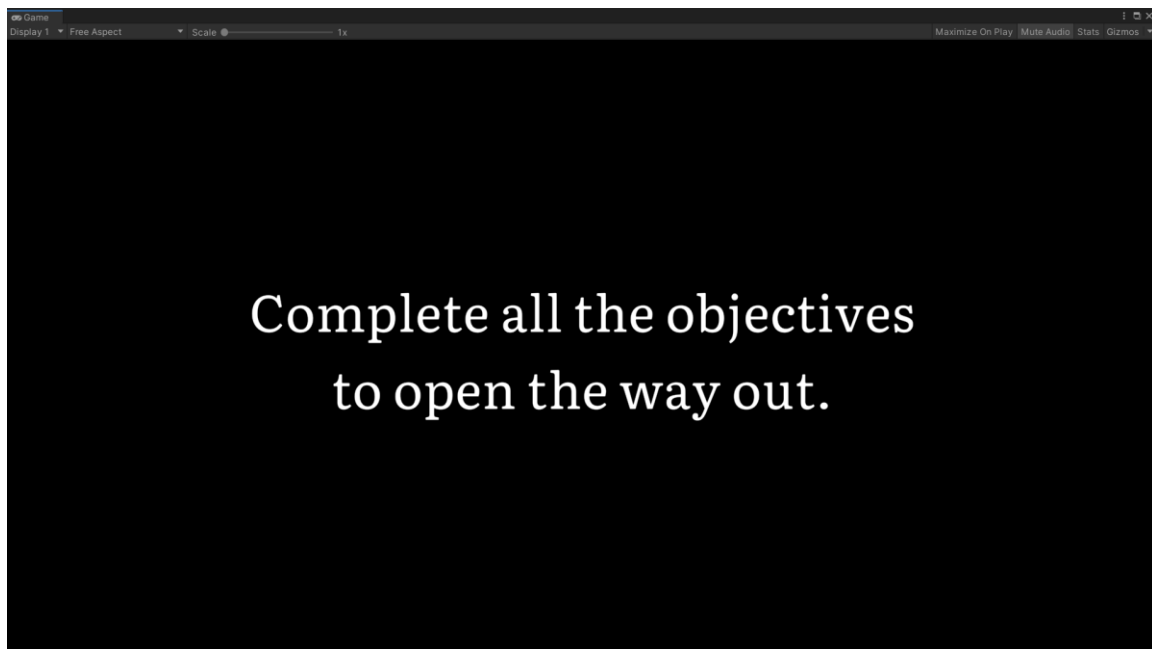


Figure 1 - Instruction screen, visible upon launch.



Figure 2 - Main area viewed from the outside.

The two tasks can be found at their corresponding waypoint (Figure 3), once within reach the player can interact with the waypoint and play the minigame associated with it. Tasks to be completed are marked by the red light on its corresponding waypoint, and tasks that have been completed are marked by the green light on its corresponding waypoint (Figure 4).



Figure 3 - Waypoint for the Tilt-A-Ball minigame.

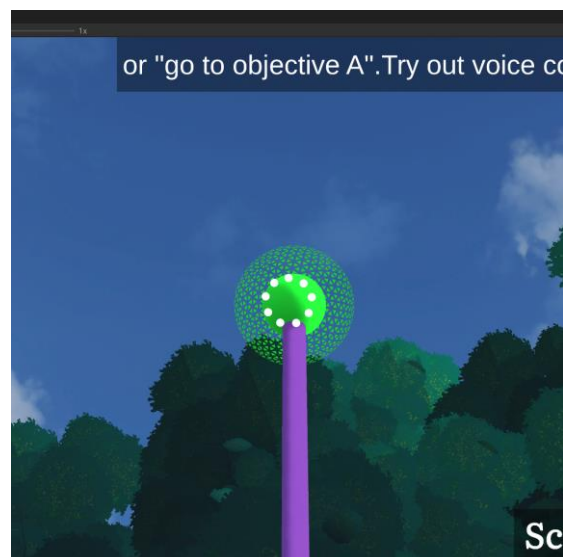
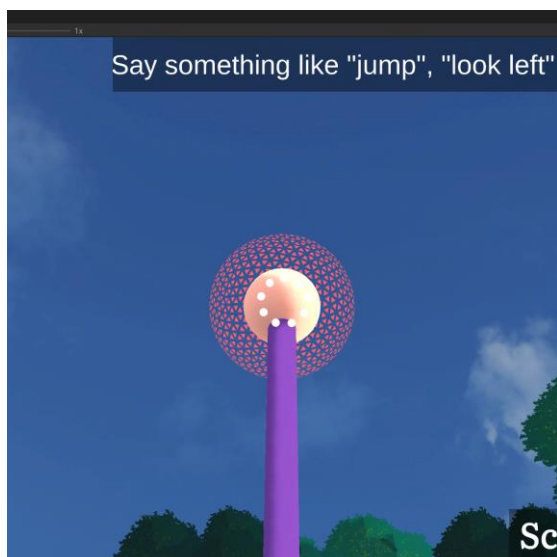


Figure 4 – Task to be completed on the left. Completed task on the right.

Once a task is complete, the player will also be notified when playing the minigame itself.

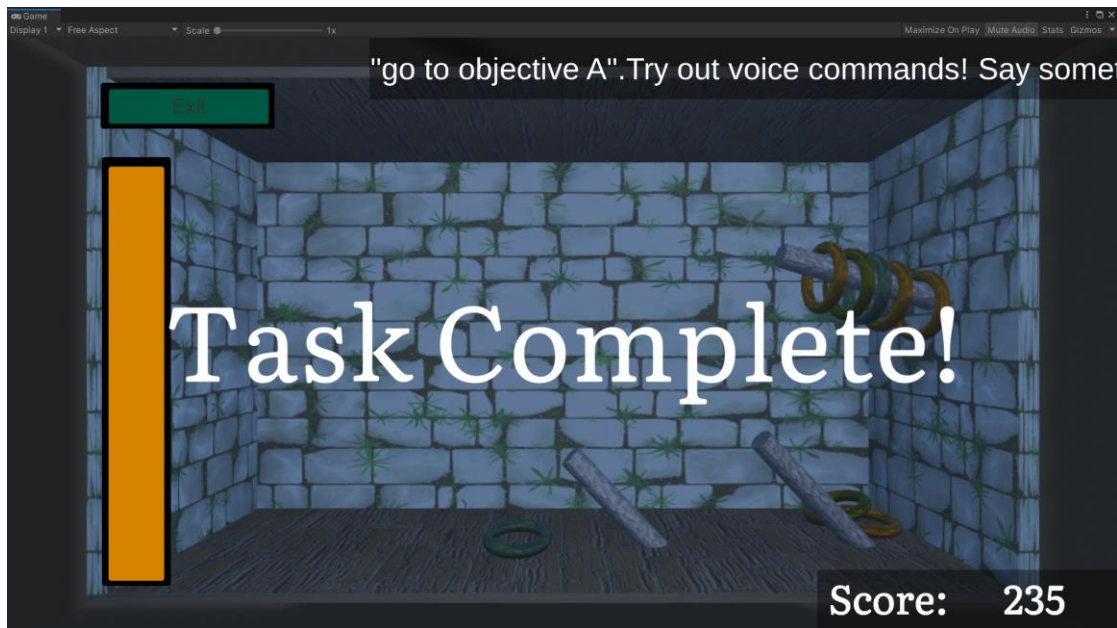


Figure 5 - Task complete, Ring Toss minigame.

Once both tasks are complete, a short cinematic will play and the metal door will be open allowing the player to leave. Finally, when the player decides to step through the door the screen will fade to black, a thank you message will display, and Spoken Word will exit automatically (Figure 7).



Figure 6 - Door opening cinematic.

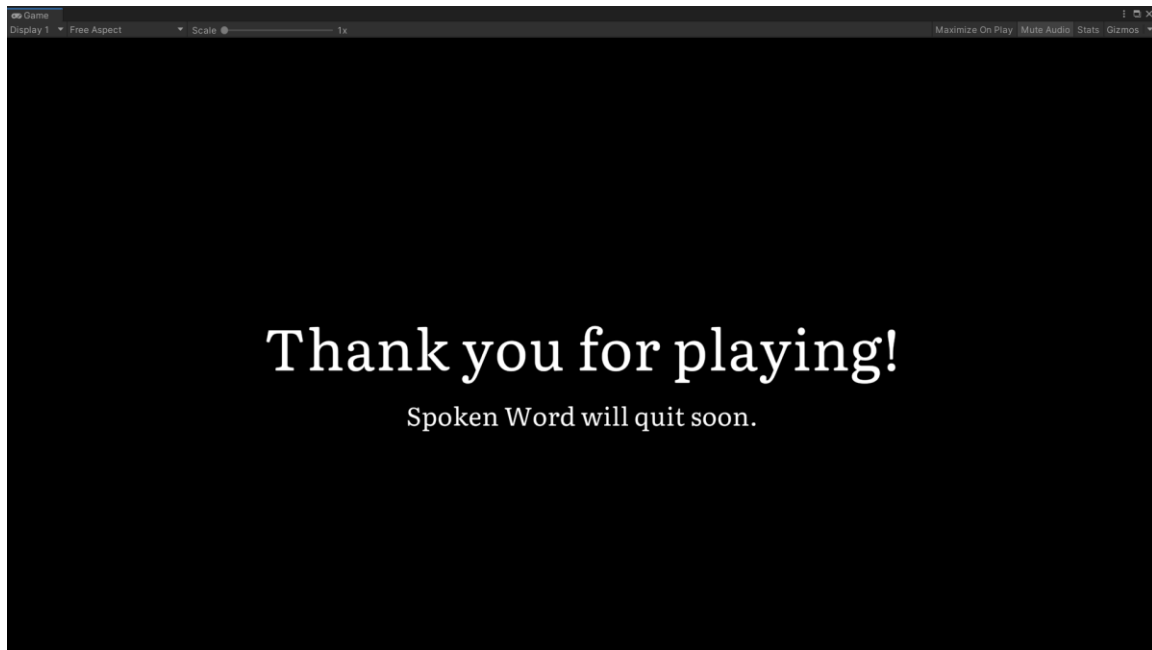


Figure 7 - End screen.

Controls

The following section will detail both the standard control scheme, referring to interaction via a keyboard and mouse or gamepad, and the voice control scheme, referring to interaction via a microphone.

Standard Controls

Keyboard and Mouse

Key	Action
Default Gameplay	
WASD	Move
Mouse Movement	Look
Space	Jump
LMB	Interact
Left Shift	Run (Hold)
RMB	Zoom (Toggle)
Esc / P	Pause
Tab	Options
Ring Toss	
X	Exit Minigame
LMB	Fire Ring (Mouse over the Ring Toss screen)
LMB / Enter	Exit Minigame (Mouse over the Exit button / Exit button selected)
Arrow Keys	Navigate to and from Exit Button
Tilt-A-Ball	
X	Exit Minigame
Mouse Movement	Tilt Arena
A	Rotate Arena Left
D	Rotate Arena Right
Space	Reset Arena Rotation
Enter / Return	Skip Level

Gamepad

For gamepad support, Spoken Word has only been tested and confirmed to work with a wired Xbox 360 controller.

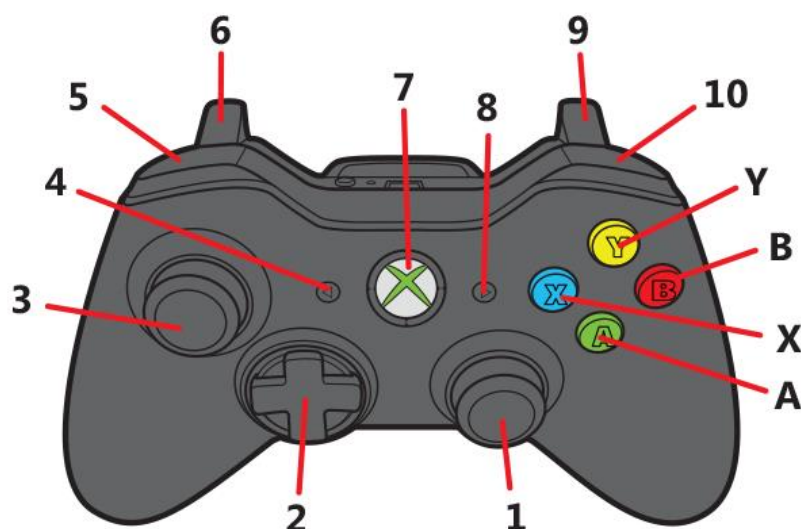


Figure 8 - Xbox 360 controller, source: <https://support.xbox.com/en-US/help/xbox-360/accessories/controllers>

Key	Action
Default Gameplay	
3 – Left Stick	Move
1 – Right Stick	Look
A – Button South	Jump
X – Button West	Interact
3 (Press) – Left Stick Press	Run (Toggle)
6 – Left Trigger	Zoom (Hold)
9 – Right Trigger	Zoom (Toggle)
8 – Start	Pause
4 – Select	Options
Ring Toss	
B – Button East	Exit Minigame
X – Button West	Fire Ring
A – Button South	Fire Ring / Exit Minigame (Exit Selected)
2 – D-Pad	Navigate to Exit Button
Tilt-A-Ball	
B – Button East	Exit Minigame
3 – Left Stick	Tilt Arena
1 – Right Stick	Rotate Arena
X – Button West	Reset Arena Rotation
Y – Button North	Skip Level

Voice Controls

When planning to use voice controls in Spoken Word, be sure to launch the game with a microphone connected to your computer and a working, stable internet connection.

Currently, voice commands will timeout after 45 seconds, to prevent this from happening be sure that the microphone receives input at least once within this period, it can be any word or phrase. If the voice commands timeout, the game must be restarted for them to work again.

Voice commands are broken up into **intents**, **entities**, and **utterances**.

An utterance can be thought of as a sentence that describes the action you would like to perform in game.

An intent refers to the specific action you want to perform itself. Intents are essentially extracted from utterances by stripping the utterance from all the “fluff” words that are needed to form a sentence but are not needed by the language understanding component.

Finally, entities are any extra pieces of information that tell us something about a particular intent.

For example:

Utterance: “I would like to move forward 10 metres”

Intent: [move]

Entities: Direction: [forward], Distance: [10]

Voice Controls – Quick Reference

<i>Utterance</i>	<i>Intent – (Action)</i>
Default Gameplay	
“Move forward”	Move – forward
“Move to objective 1”	Move – to objective 1, Ring Toss
“Look left”	Look – left
“Jump”	Jump
“Interact” / “Use”	Interact
n/a	Run (Toggle)
“Zoom”	Zoom (Toggle)
“Pause” / “Unpause”	Pause
“Options”	Options
“Leave the game”	Move to the exit – only after all minigames are completed.
Ring Toss	
“Exit”	Exit Minigame
“Fire”	Fire Ring
Tilt-A-Ball	
“Exit”	Exit Minigame
“Tilt down 90 degrees”	Tilt Arena (down, 90 degrees)
“Rotate right 30 degrees”	Rotate Camera (right, 30 degrees)
“Reset”	Reset the tilt of the current arena
“Skip”	Skips the current level.

Voice Controls – Comprehensive Reference

Please note, for most actions this table is not an exhaustive list of the utterances understood by the voice controls in Spoken Word. It is just a more detailed list of examples to get users familiarised with how to use the voice controls.

Please feel free to experiment and form your own utterances when in game.

<i>Intent</i>	<i>Example Utterances</i>
	<i>Default Gameplay</i>
<i>Move</i>	"Go 20 metres in front" "March left" "Step back" "Walk to Ring Toss" – Travel to the ring toss waypoint. "Get going to objective 2" – Travel to the tilt-a-ball waypoint. "Go to task 1" – Travel to the ring toss waypoint.
<i>Look</i>	"Look left / up / down / right" – 45° turn in specified direction "Rotate left" "Turn around" – 180° turn "What is behind me" "What is below me" "90 degree turn" – No direction specified, so nothing will happen. "90 degree turn to the left" – Turn left 90°
<i>Jump</i>	"Jump"
<i>Interact</i>	"Use" "Interact"
<i>Zoom</i>	"Zoom in" "Zoom out" "Zoom"
<i>Pause</i>	"Pause" "Unpause"
<i>Options</i>	"Options"
<i>Leave</i>	"Leave the game" "Go to the exit" "Exit Spoken Word"

Ring Toss

<i>Exit Minigame</i>	"Exit"
	"Close"
	"Quit"
	"I'm done"
<i>Fire Ring</i>	"Fire"
	"Shoot"
	"Launch"

Tilt-A-Ball

<i>Exit Minigame</i>	"Exit"
	"Close"
	"Quit"
	"I'm done"
<i>Tilt Arena</i>	"Dip a tiny amount to the right" - 15° tilt to the right
	"Incline a lot to the left" - 45° tilt to the right
	"Incline forward" – (Neutral) 30° tilt forward
	"Lean right"
	"Slant down a bunch"
	"Tilt up and left a lot" – Tilt to the top left 45°
<i>Rotate Arena</i>	"Rotate left / right by 90 degrees"
	"Rotate arena to the right" – Rotation is always 90° unless specified
	"Spin the level to the left by 10 degrees"
	"Spin left 18 degrees"
<i>Skip</i>	"I want to skip this level"
	"Next level"

Other

Known Bugs

A small list of known bugs is detailed below. So far, no major issues that impact the use of voice controls have been found.

Image	Description
	<p><i>Ring Toss power bar</i></p> <p>When playing the ring toss minigame, you may notice that the power bar on the right-hand side sometimes does not start moving again from the same position after having paused briefly when firing a ring.</p> <p>For now, just take some extra time between firing rings so that you can see where the bar will begin moving from.</p>
	<p><i>Movement after minigame</i></p> <p>After completing or exiting a minigame, if you start moving straight away with a mouse and keyboard or gamepad your input will stop being read and the character will no longer move after a short period.</p> <p>To mitigate this, let go of the movement keys or joystick briefly and then start moving again.</p>
	<p><i>Tilt a ball clipping</i></p> <p>It is possible that the ball in the tilt a ball minigame falls through the arena it is in, this is especially prevalent when the ball is stuck in corners and at lower framerates.</p> <p>To prevent this from happening try not to have extremely quick movements. Again, especially at lower framerates (below 30) and when resting the ball in a corner.</p>

Future Additions

This section will detail some of the future additions that will be made to Spoken Word and are not present in the current version.

Description
Speech recognition that allows for intuitive navigation of dummy menus.
Game mechanics in the core gameplay loop that are designed entirely around and rely on speech recognition.
Ensure all information essential to the gameplay and narrative are conveyed clearly and in multiple forms.
Subtitles and captions options are present for any audio tracks that provide information to the user.
The game must greet players with all accessibility options upon launching the game.
Offer a list of included accessibility features upon launching the game.
Offer a list of included accessibility features upon launching the game.
Ability to adjust look sensitivity.
Present tutorials for all gameplay elements and sequences.
Clear, high contrast and adjustable size font for all information conveyed via text.
Allow controls to be remapped to the user's liking.
Allow the game to be played in either windowed or full screen mode. Resolution must be able to be adjusted as well.
Offer alternatives to inputs unique to certain puzzles or gameplay sequences.
At least 3 puzzles to be completed.
Provide volume controls for all audio tracks.
Provide the ability to adjust post processing effects like contrast and saturation.
Adjustable graphics options for low-end computers.