



## Training and Instruction Manual



**CITADEL**

**V0.9.3**

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# Citadel Overview

## What is Citadel?

Citadel is a customized, flexible active video game (AVG) designed to promote physical activity, fitness and functional mobility. Citadel focuses on helping the player improve their physical balance.

Citadel has multiple flexible parameters and settings so that clinicians can set the game experience to the needs of their patient and the goals of therapy.

## Citadel Objectives

The object of Citadel is for players to gain points by collecting good blocks and avoiding bad blocks. This is done starting off at a slow pace that gradually picks up. The clinician has the ability to adjust the settings and sensitivity of the game so that the game can be adjusted to for the physical therapy goal of the player. Parameters can be adjusted so that the player can move fast and not need to maneuver around hazards.

Players collect points using hands or body to shift the lane of the vehicle. The players can use both hands in a seesaw motion or their whole body by leaning side to side to control the vehicle. The clinician can choose if they want hands or body to be used in the game depending on the therapy goals they are working on.

## Citadel – How to collect points

Players will gain points when they collect good blocks and avoid bad blocks. The green blocks will add points and the red blocks will deduct points from the final score. As the player continuously collects the green blocks, the speed of the game will increase. As the player hits the red blocks, the speed of the game will decrease.

## Connecting the Citadel equipment



- Set up the Computer on a flat surface in an area that has enough room for game playing (approximately 6 feet x 3-4 feet)
- Place the Kinect V2 sensor in the center of the playing screen and play area
  - The screen may be your laptop screen or a flat screen if one is available at your clinic site
- Before you power on the computer be sure to do the following:
  - Connect the Computer power cord.
  - Plug the Computer into the power strip.
  - Connect the Kinect adaptor to the Kinect V2 sensor cord
  - Plug in the Kinect adaptor USB cable to the BLUE USB port (USB3 port) of the Computer
  - Plug in the Kinect adaptor to the power strip. Make sure the white light on the Kinect adaptor power block is on.
  - If you are using a separate flat screen (not the laptop screen), plug in the HDMI cable to the Computer HDMI port on the LEFT side of the computer and plug in the other end to the flat screen HDMI port.
- Now you are ready to power on the game computer!



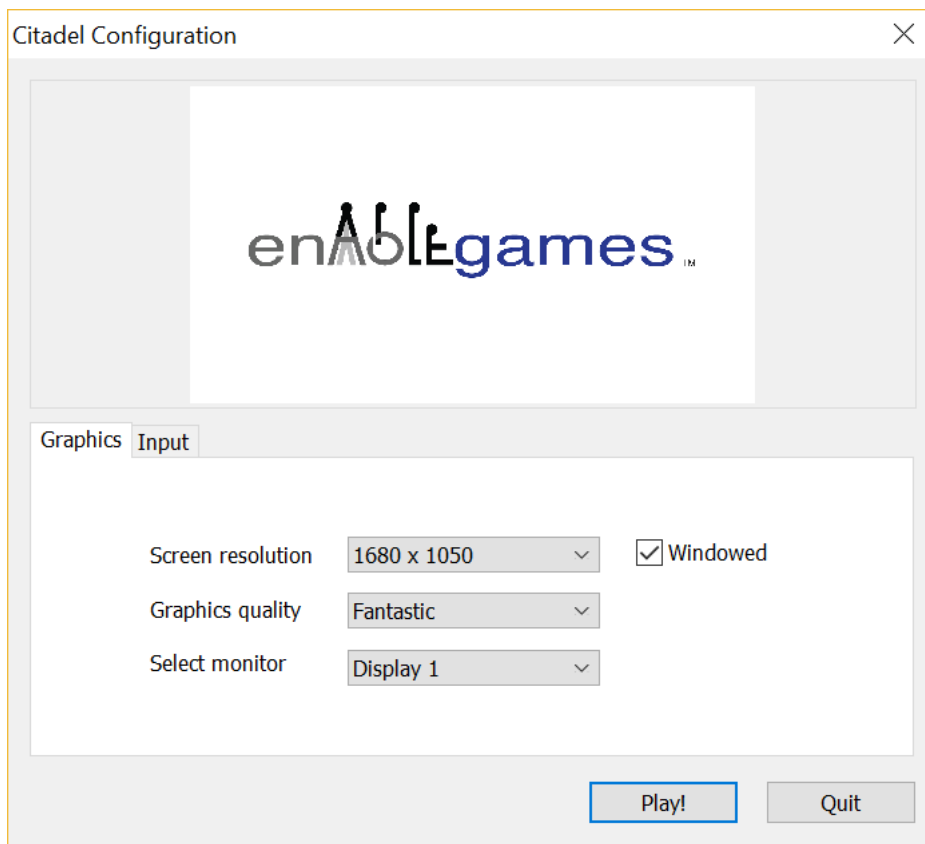
# Opening the Game

## Locating the game

## Starting the Game

Locate the game on the enAbleGames App.

Click the game named “Citadel” and then click on the Start button. After a few seconds, a window will open titled “Citadel Configuration.”

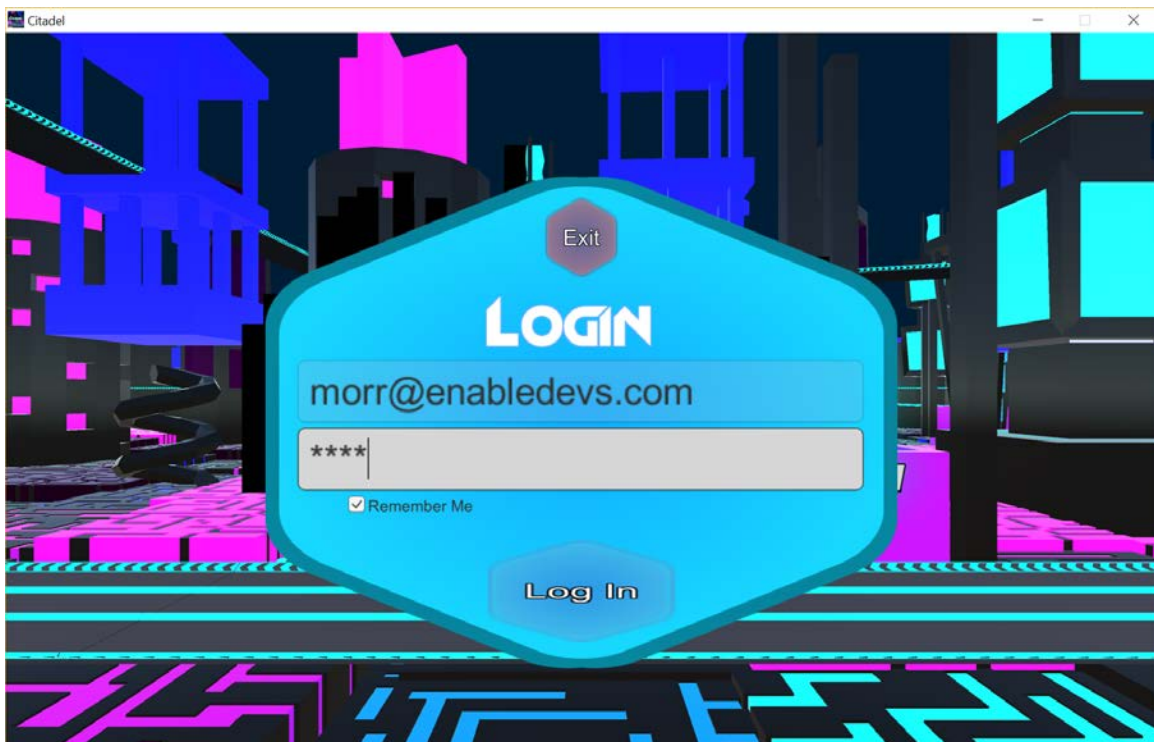


- **The program should automatically adjust to the computer's settings, thus no changes should be needed. Click "Play!"**
- If the settings are incorrect or you would like to manually change the settings:

- Screen resolution– adjusts the resolution/size of the game to fit your screen.
- Graphics quality – changes how good the graphics of the game are.  
**NOTE:** Better graphics may mean slower gameplay. If gameplay seems to be lagging or choppy, we recommend changing the graphics to “fast” or “fastest.”
- Select monitor – allows you to change the monitor that the game is displayed on. This should not be changed from “Display 1.”
- Windowed checkbox – determines if the game opens in a separate window that can be minimized or closed, or if it opens windowless in full-screen mode.

## Login Menu

- The Login screen allows you to enter your account ID and password.
- The Remember Me button saves the information so you don't have to re-enter it again.
- Click "Log In" to continue, or the red X button to quit.





## Citadel Main Menu

- The Main Menu screen allows you to change parameters, select profiles, and start the game.



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## New Game

- The “Options” button allows you to change the parameters of the game.

## Options

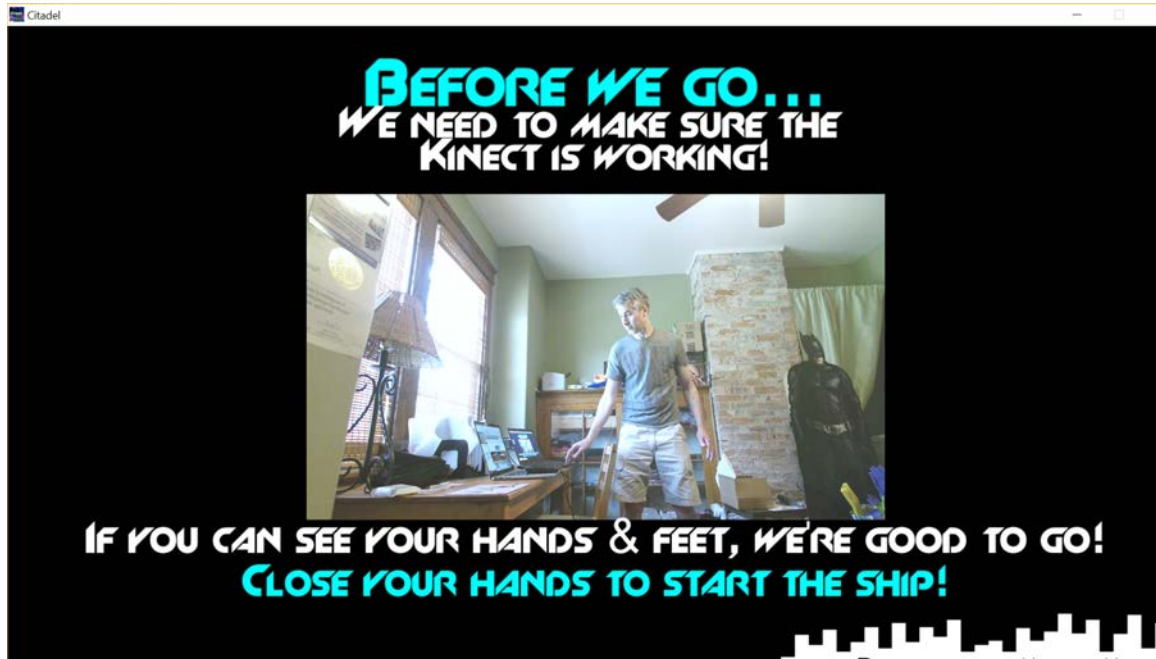
- The “Options” button allows you to change the parameters of the game.
- Clicking the “Options” button will bring up the parameters window.

## Exit

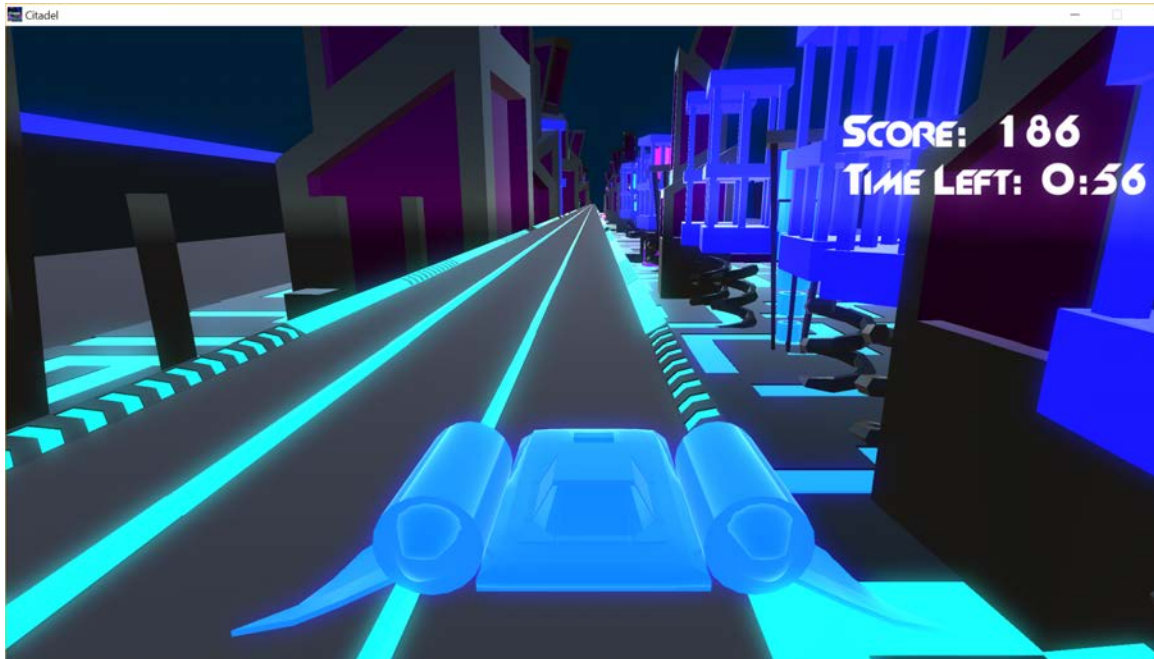
- The “Exit” button quits the game.

## New Game

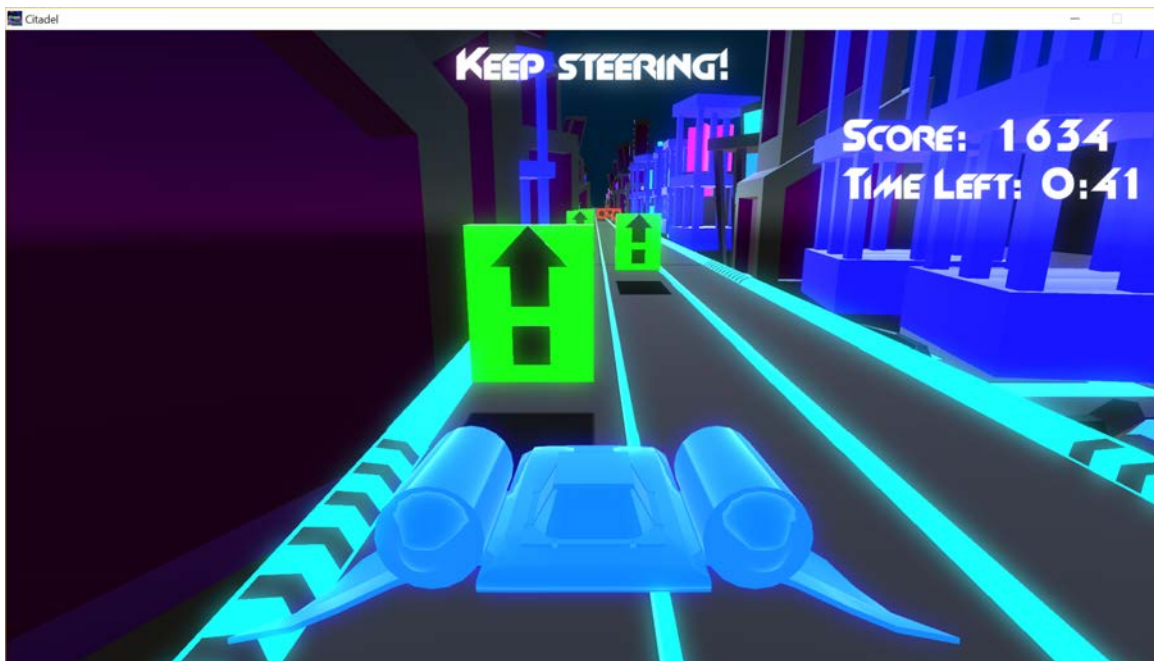
- After making the desired parameter changes and loading a body tracking profile, click “New Game” on the “Main Menu” screen.



- You will now see the Kinect Sensor screen.
  - This screen ensures that the Kinect sensor is calibrated to the player's body.
  - NOTE: For best experience, ensure that the sensor screen can see BOTH the hands and feet of the player.
- When the player is ready, have them raise their arms in a “T” motion, and make a fist with both hands. This will start the game.
- If a player cannot do this, **hitting the Spacebar will also start the game.**

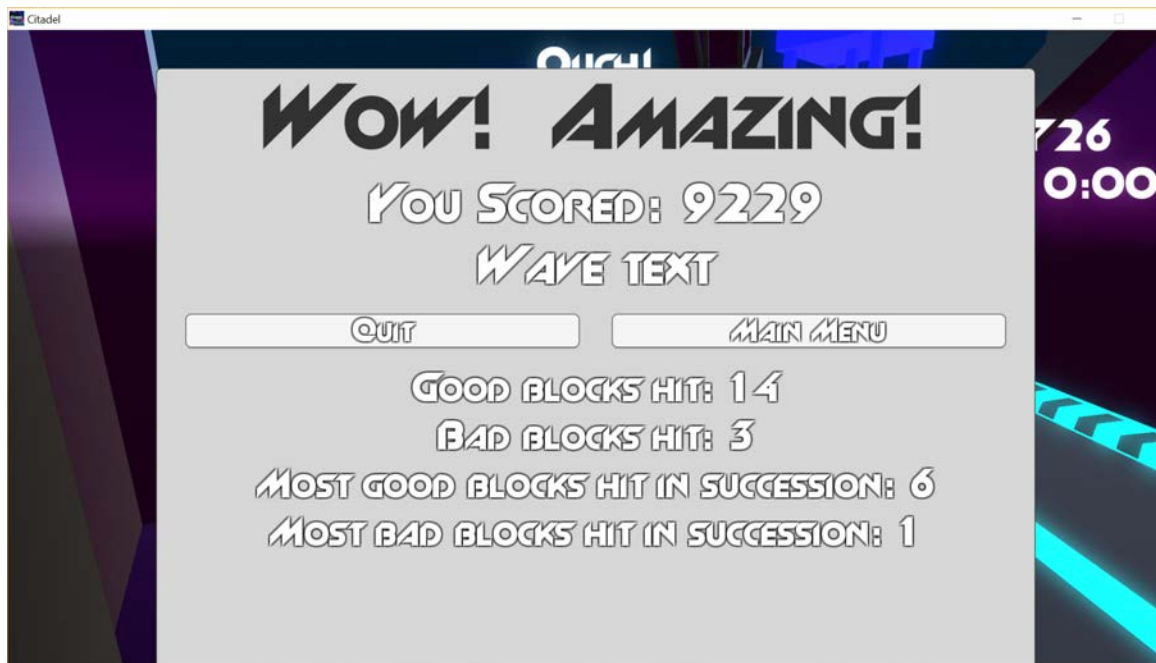


- The game begins, and depending on the Body Tracking profile that was selected, the player's motion controls the lane of the ship. Avoid the Red blocks and hit the Green blocks. The ship moves faster the better the player does.



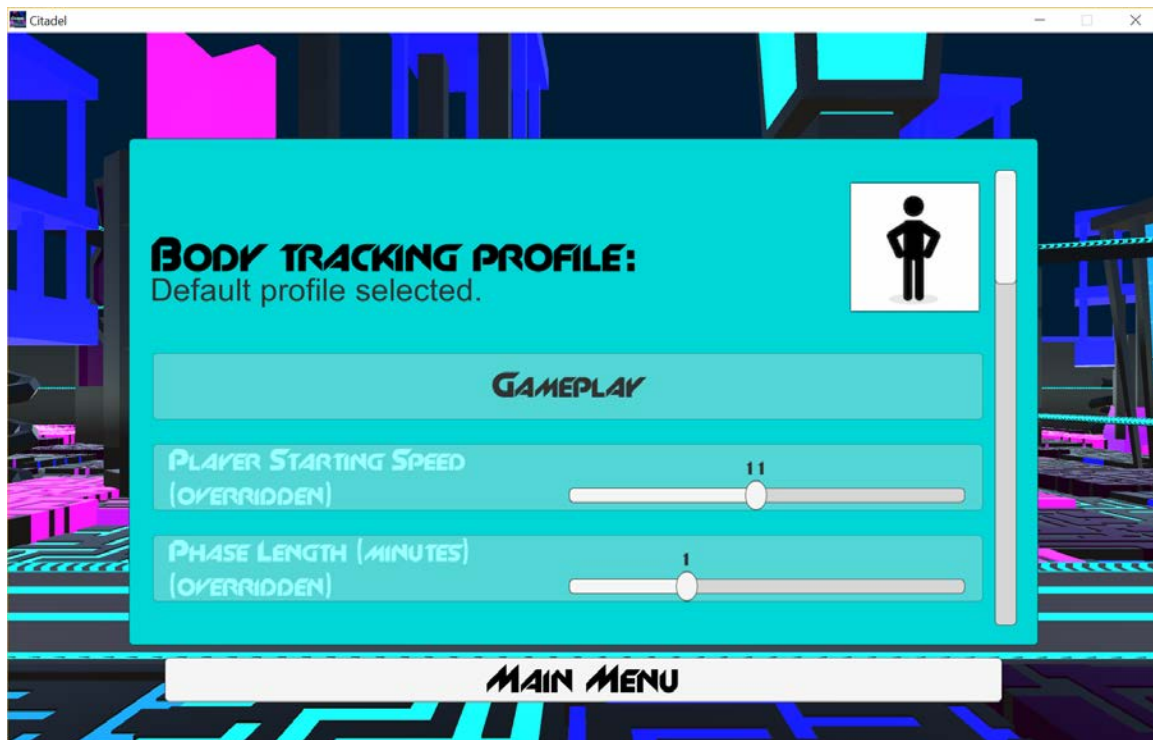
- NOTE: The default Body Tracking profile uses the Left Elbow angle to control the ship.

- When the game is over, the Score Screen pops up to show how the player did.



## Options

There are over 13 game parameters that can be set to create a customized gaming experience for the player. All parameters have default settings but clinicians may opt to set specific parameters to focus on a player's needs and abilities and to work toward achieving therapy goals. If a parameter is remotely Overridden via the web portal, it cannot be set on the parameter screen, and will be grayed out with an **Overridden** message below, as seen in the picture below.



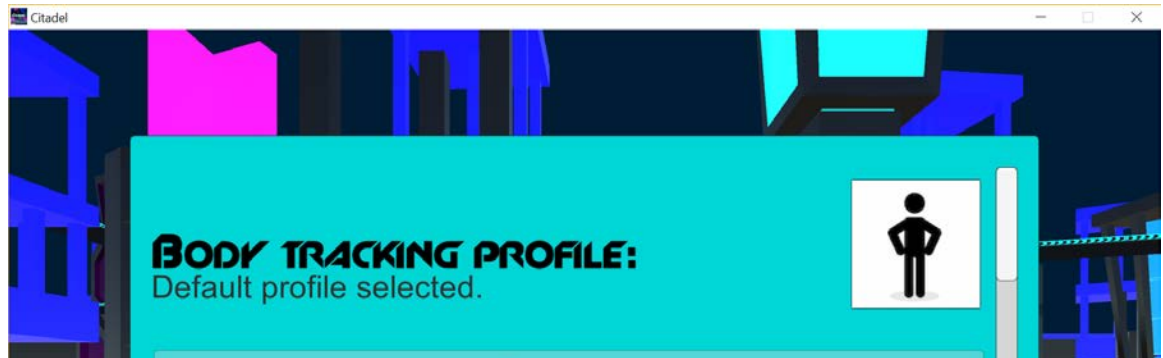
Before the game begins, a clinician will decide the goal for using the game in the therapy session. For example the clinician may want to:

- Work on physical activity or mobility endurance and may set the 'Phase Length' at a higher level for longer duration
- Target the type of therapy by choosing between arms or body gestures to control the game
- Set the amount of good and bad blocks on each lane to further target type of therapy and movements
- Set special effects to best meet the players cognitive and other sensory needs such as turning off noise, decreasing blocks, increase aesthetic choices motivation and fun

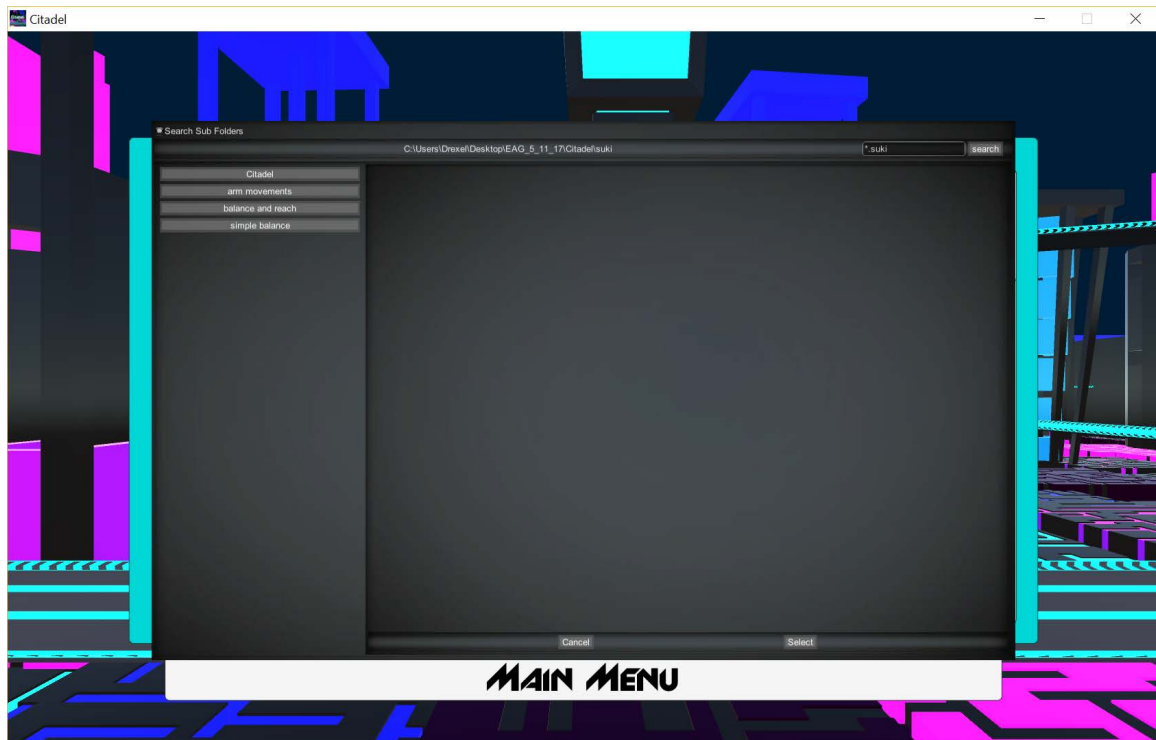


## Body Tracking Profile

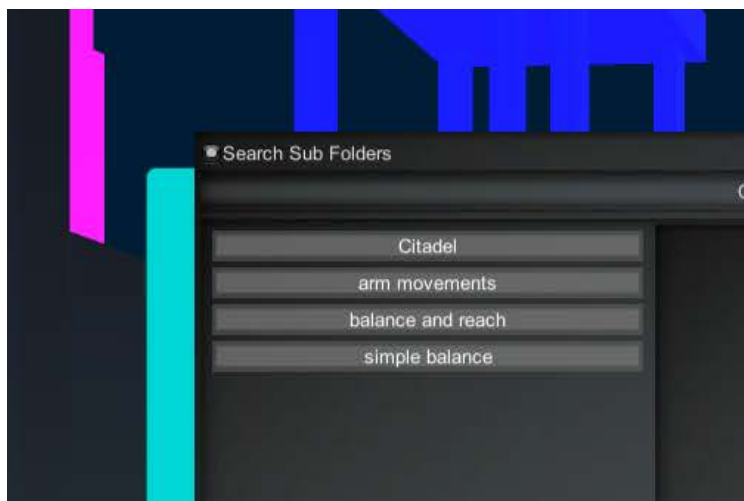
- Click the stick figure body icon in the upper-left. A new window for selecting profiles will pop up. A list of profile categories will appear on the left.

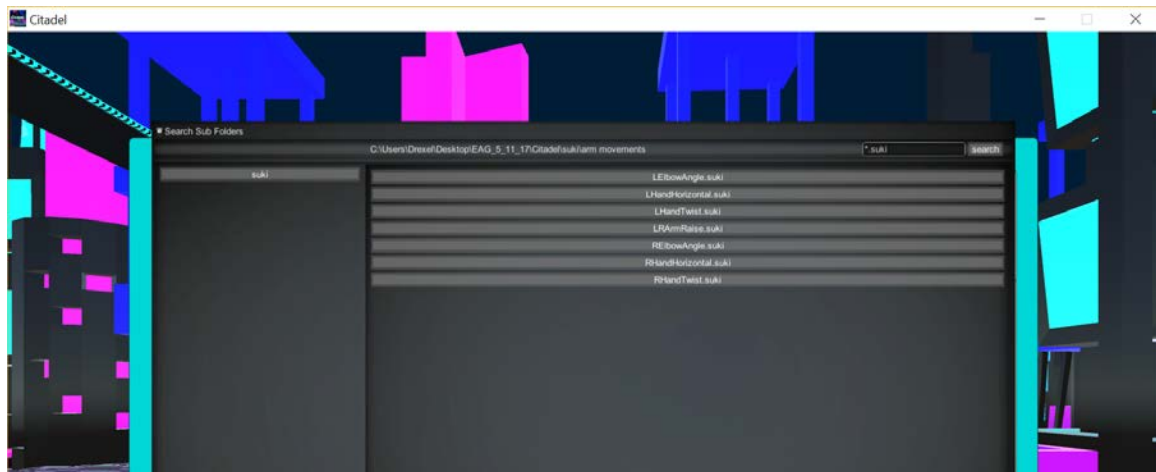


- Load a Profile – This allows you to load a Body Tracking Profile depending on the player's needs. This maps the player's body movements into control of the ship. (e.g. The ship tracks left/right leaning OR the ship tracks left/right reaching OR the ship tracks up/down elbow flexion)
  - Body Tracking Profiles are part of our advanced Standard User Kinematic Input (SUKI) framework. New profiles can be easily added.
  - NOTE: Categories are directories where the profiles are located, under the Citadel/suki directory.

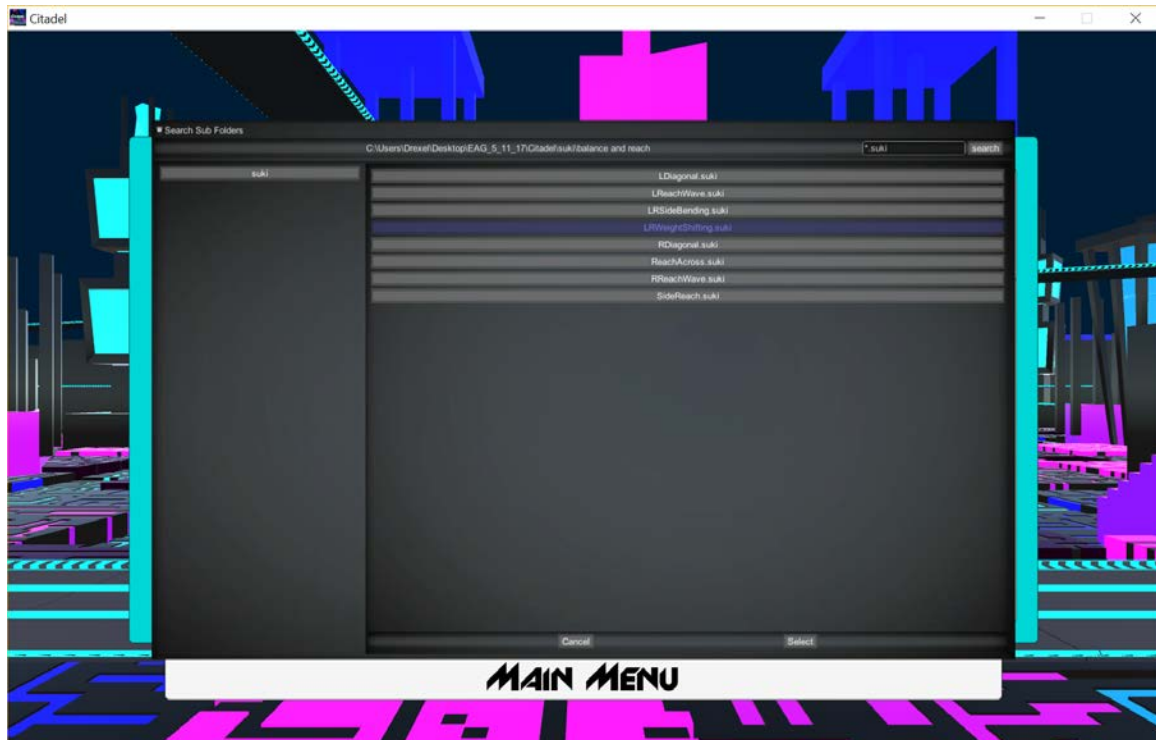


- Click one of the three profile categories that appear under the Citadel button to see the profiles in that category.
- Consult the Profile descriptions section below to get a detailed description of each of the standard body tracking profiles.





- Select the player profile that best suits the goals for the player. To return to the Categories, click the “suki” button on the left.

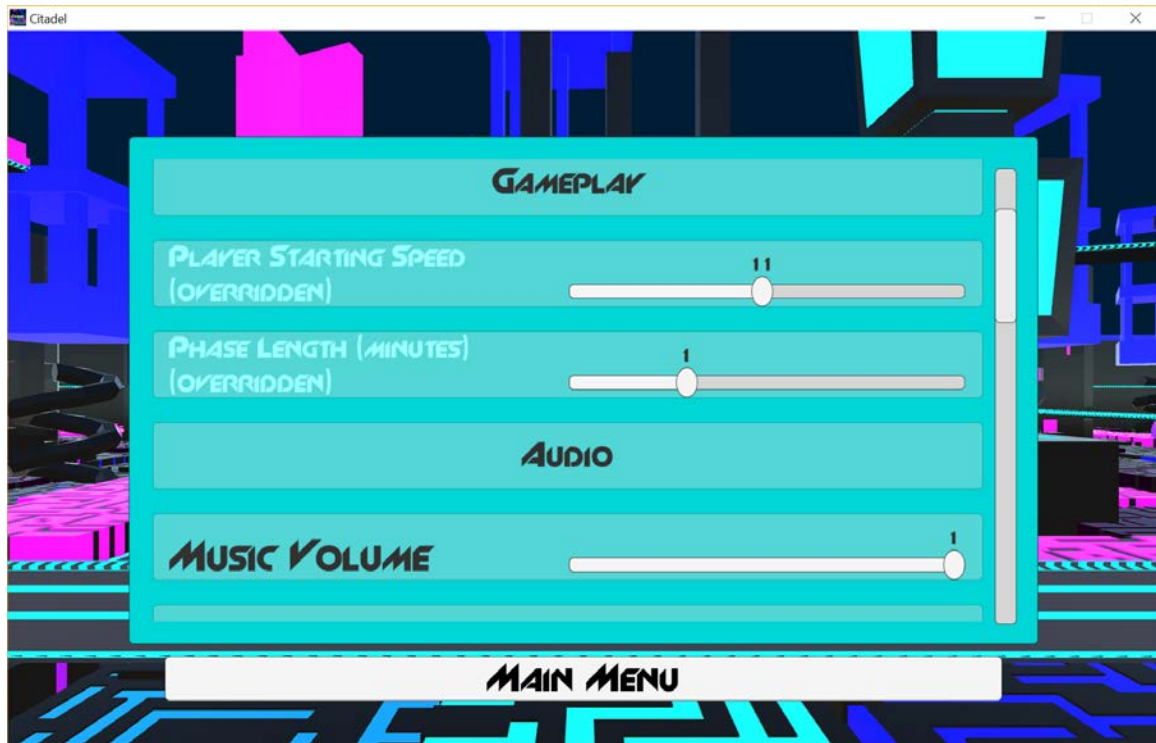


- Once a profile is selected, click the “select” button at the bottom of the window. You will now be returned to the parameters window.



## GamePlay

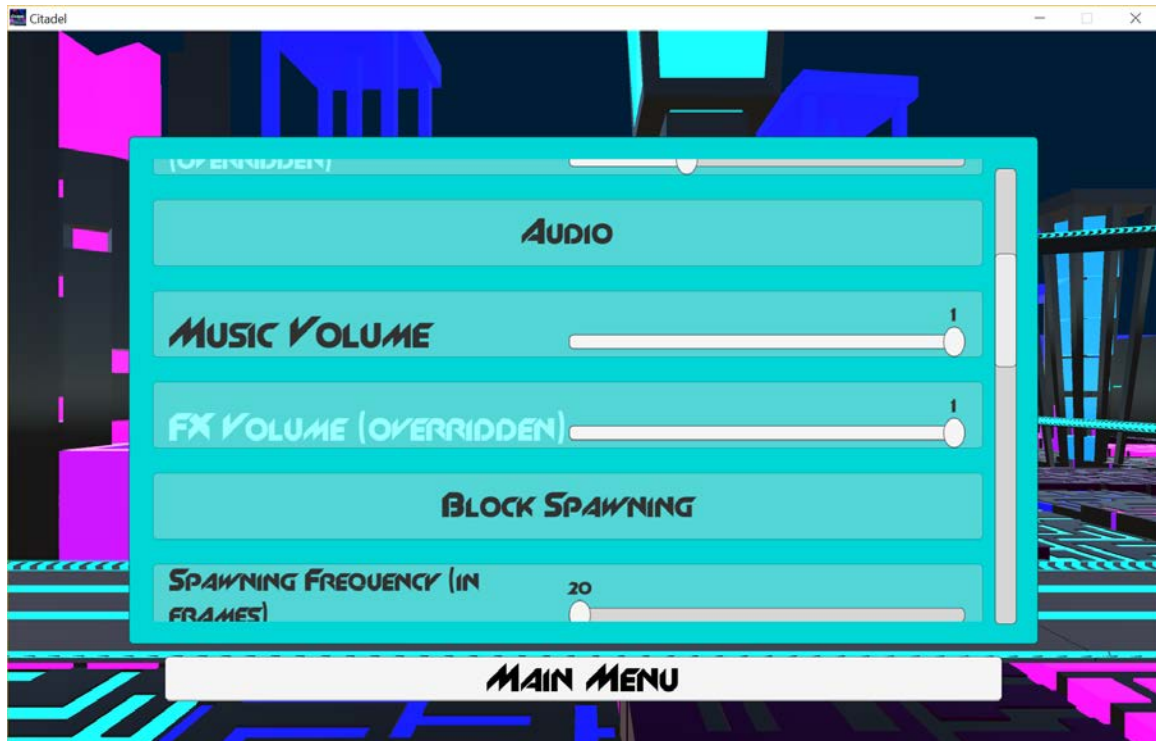
Choosing game length and starting difficulty



Player starting speed	Changes the speed that the player moves at the start of the game.
Phase length	Changes the length of the game in minutes.

## Audio

Setting music and sound effect volume.



<b>Music Volume</b>	Allows you to change the volume of the music.
<b>FX Volume</b>	Allows you to change the volume of the sound effects.

## Block Spawning

Setting how difficult the game is by how many good (green) blocks and bad (red) blocks there are, and the lane chance of each.



<b>Spawning Rate</b>	Adjusts how frequently new blocks can spawn (in seconds). Note: works together with <b>Block Spawn Chance</b> to actually spawn new blocks.
<b>Block Spawn Chance</b>	Percent chance that a block will actually spawn every <b>Spawning Rate</b> seconds. 100% means a block will spawn every time.
<b>Green Block Chance</b>	Changes how likely a green block or red block will spawn. <b>Increasing</b> this number makes green blocks spawn <b>more</b> often. For example, 90% means 9 green blocks will spawn for every 1 red block, on average.
<b>Left Lane Chance</b>	Chance blocks in the left lane. Default is 100%
<b>Middle Lane Chance</b>	Chance blocks in the middle lane. Default is 100%
<b>Right Lane Chance</b>	Chance blocks in the right lane. Default is 100%

## Visual Effects



<b>Glow</b>	Makes the scene have a slight glow around the bright objects.
<b>Co-pilot</b>	Toggles whether you want the co-pilot motivational messages.
<b>Score notifications</b>	Toggles whether you want the score to be displayed during the game.
<b>HUD Color Changes</b>	Toggles whether to show a square below the ship to show when a block has been hit.
<b>Track Light Changes</b>	Toggles whether to have the race track rail lights change colors to show when a block is hit.

# Body Tracking Profiles

- Body Tracking Profiles are part of our advanced Standard User Kinematic Input (SUKI) framework. New profiles can be easily added.
- NOTE: Categories are directories where the profiles are located, under the Citadel/suki directory.

## Arm Movements

### Elbow Angle

#### **LElbowAngle.suki**

#### **RElbowAngle.suki**

- Raise either left or right arm to side of body and move forearm back and forth like you are waving. Arm movement to the left and right moves the ship left and right.

### Reaching Forward, Left and Right

#### **LHandHorizontal.suki**

#### **RHandHorizontal.suki**

- Raise either left or right arm in front of the body. The hand's horizontal position in relation to the center of the body (head) controls the ships horizontal position.

### Raising Both Hands

#### **LRHandRaise.suki**

Raise the left hand above shoulder height to move 1 lane left. Raise the right hand above shoulder height to move 1 lane right. To move multiple lanes, raise and lower hand multiple times.

### Forearm Twist

#### **LHandTwist.suki**

#### **RHandTwist.suki**

- Raise either left arm or right arm straight out to side of body. Rotate the hand (wrist) along the twist direction of the forearm to change lanes.

## Balance and Reach

**\*IMPOTANT FOR PLAY:** If player is bent forward or leaning over, the ship will change to orange and inputs won't register (i.e. the ship will not move). In this way, we constrain/limit the player's posture. The player must correct their posture to continue playing. The ship will resume original color at that time to proceed with play.

### Reaching to the Side

#### **SideReach.suki**

- Reach/ stretch left arm up and away from the side of body to move one lane to the left, and same for the right (reach/ stretch right arm up and away from the side of body to move one lane to the right). Player must be up straight and cannot be bent forward/leaning over.
- Discrete movement among lanes (move there, and stay there until a subsequent movement).

### Reaching Across

#### **ReachAcross.suki**

- Move the ship right by crossing left hand up and across the body and reaching up toward the right. Move the ship left by crossing right arm in front of the body and reaching up and to the left.
- Discrete movement among lanes.

### Arm Reaching and Waving

#### **LReachWave.suki**

- Joystick-like movement left and right using the left arm as the control. Extending the left arm up and away from the body will move the ship left, and the player bringing the arm back over their head toward the right will move the ship right.
- Player's posture must be straight.

#### **RReachWave.suki**

- Joystick-like movement left and right using the right arm as the control. Extending the right arm up and away from the body will move the ship right, and the player bringing the arm back over their head toward the right will move the ship right.
- Player's posture must be straight.

### Crossover Arm

#### **LDiagonal.suki**

- Joystick-like movement left and right using left arm as the control. Stand straight and twist upper body to the right. Reach with left hand up and to the right to move right, or back to the left to move left (a diagonal movement of the arm in front of the body).
- Player being bent forward or leaning over (i.e. torso not in vertical alignment) will fail the constraint.

#### **RDiagonal.suki**

- Joystick-like movement left and right using right arm as the control. Stand straight and twist upper body to the right. Reach with right hand up and to the right to move right, or back to the left to move left (a diagonal movement of the arm in front of the body).
- Player being bent forward or leaning over (i.e. torso not in vertical alignment) will fail the constraint.

### Torso Side Bending

#### **LRSideBending.suki**

- Joystick-like movement using upper body side bending. Side bend at the torso with hips stationary to move the ship. Torso side bending left will move the ship to the left. Torso side bending right will move the ship to the right.

### Weight Shifting

#### **LRWeightShifting.suki**

- Movement is based on hip/pelvic position in relation to foot position. Shifting the hips and pelvis over the left foot will move the ship to the left. Shifting the hips and pelvis over the right foot will move the ship to the right.
- Ensure that the player maintains balance.