PLAYER HANDBOOK

Play the Knave is a mixed reality video game for Windows that enables virtual design and performance of dramatic scenes. Use the game's menu system to select one from among hundreds of Shakespeare scripts (preloaded), or write your own script for 1-4 characters. Then design your virtual production of the scene, selecting avatars, a soundtrack, and a theater stage. When it's time to perform, your avatar appears on your virtual theater stage. Lines from your script appear karaoke-style, to be read aloud, and a Kinect motion-sensing camera allows you to use your own body to move your avatar around the virtual stage. The game automatically creates an animated video of the performance, so you can watch or share your production after you play.

But there are lots of other things you can do with *Play the Knave* besides performing scripted dramatic scenes. This handbook gives you an overview, step-by-step instructions, and tips for how to get the most out of *Play the Knave*.

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REQUIRED HARDWARE

You'll need the following hardware in addition to a large TV or projector with screen. If you don't have particular pieces of equipment, you can arrange to borrow them through our Knave Kit Equipment Loan Program. See the Classrooms page at http://playtheknave.org to learn more.

1) A gaming PC computer that runs Windows 8 or 10. Most "gaming computers" will work, but the following are recommended specs for the PC you choose to run *Play the Knave*:
   - 64 bit (x64) processor
   - 8 GB Memory
   - Intel i7 3.0 GHz (or higher)
   - Built-in USB 3.0 host controller (Intel or Renesas chipset).
   - DX11 capable graphics adapter (see list of known good adapters below)
     - ATI Radeon HD 5400 series
     - ATI Radeon HD 6570
     - ATI Radeon HD 7800 (256-bit GDDR5 2GB/1000Mhz)
     - NVidia Quadro 600
     - NVidia GeForce GT 640
     - NVidia GeForce GTX 660
     - NVidia Quadro K1000M

2) A Kinect v2 motion sensor device (ASIN# B00YT168WA), the camera used for the Xbox One. Microsoft has stopped manufacturing these, but you can still find them through various distributors online. We are investigating options for additional motion sensor devices that would be compatible with our software.

   *** Make sure you have the Kinect v2, not Kinect v1, which will not work ***

3) A Kinect v2 adapter (to connect your Kinect to your PC). E.g ASIN# B07LH1V4XP. Note that Microsoft has stopped manufacturing these adapters, but all the non-Microsoft brands have worked for us.

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Note: Your TV or projector will need an HDMI connection. If you have only a VGA input, you will need an HDMI to VGA adapter.
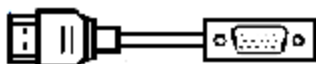
B. SETTING UP YOUR HARDWARE
1. Place the Kinect camera at the edge of a table or surface in front of your TV or screen, with its sensor facing toward the players. Make sure there is a power outlet nearby.
2. Place your computer near the Kinect.
3. Connect your computer to your TV or projector.
4. Make sure that there is sufficient space for the players to move around in front of the TV or screen.
5. Connect your computer to the Kinect camera by using the Kinect adapter. Notice that there are three ports on the adapter, each with its own dedicated cable:
   a. A port for the cable that connects the adapter to a power outlet.
   b. A port for the cable that is attached to your Kinect camera.
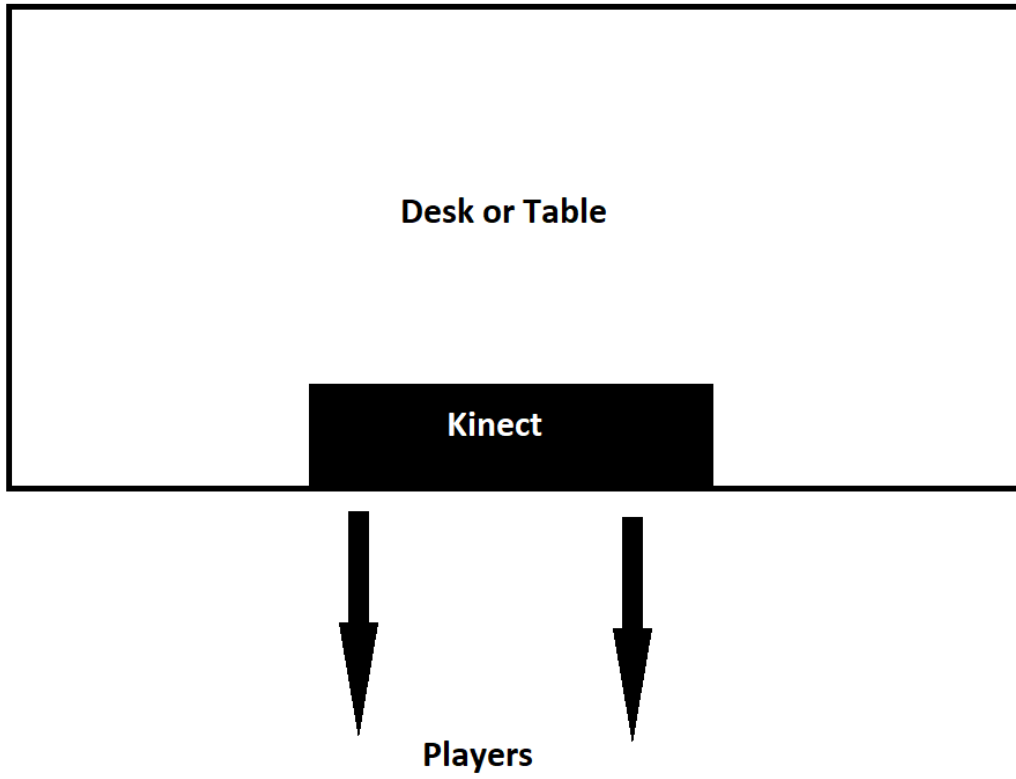   c. A port for the cable that connects the adapter to your computer's USB 3.0 port.

Make sure all your input plugs are connected tightly to their sockets.

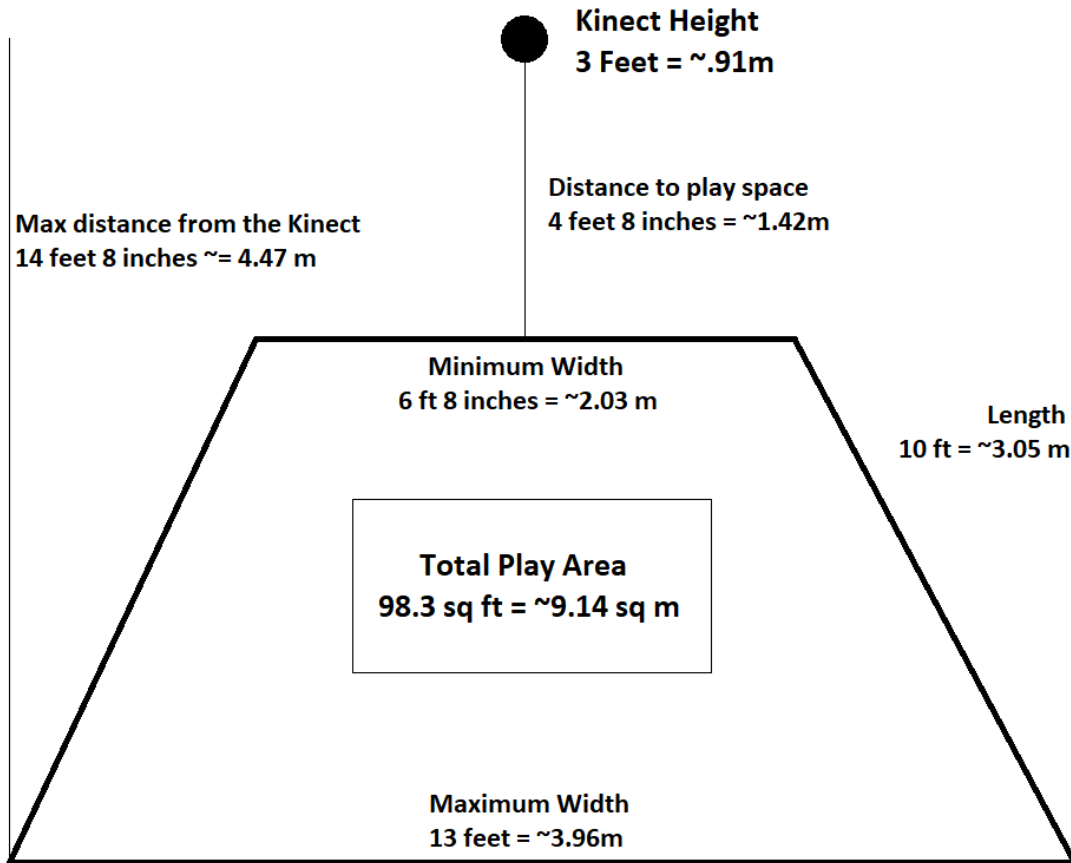**If you are borrowing a Knave Kit from us, consult the kit instructions.**

TIPS FOR A GOOD GAME:
1.   Position the Kinect so that its front edge is directly on top of table's front edge. [See "Kinect Positioning" illustration.] The surface can be anywhere between 2 and 6 feet of the ground. Adjust the angle of the camera by tilting it up if the camera is lower or tilting it down if the camera is up high.
2.   You will need a good amount of open space (minimum 6 feet) in front of the Kinect. The Kinect will search for people who are its optimal zone, shown in the diagram [See the "Play Space" illustration]. So it is best to clear space on the sides of the playing area as well. The more space you have, the more your players can move around. The more players you have, the more space you will need.

Kinect Positioning

Desk or Table

Kinect

Players

Play Space

Kinect Height
3 Feet = ~.91m

Distance to play space
4 feet 8 inches = ~1.42m

Max distance from the Kinect
14 feet 8 inches ~= 4.47 m

Minimum Width
6 ft 8 inches = ~2.03 m

Length
10 ft = ~3.05 m

Total Play Area
98.3 sq ft = ~9.14 sq m

Maximum Width
13 feet = ~3.96m

Play The Knave Setup

Display Device (Monitor, TV, or projector)

HDMI Cable
(plus HDMI to VGA adapter
if necessary)

Mouse and Keyboard

Computer power adapter

Computer

Kinect USB Adapter

Kinect Camera

Power outlet

Kinect power adapter

(Optional) If you'd like to get your Kinect camera's feedback to help you set up your play space, you can install an optional software program from Microsoft.

    a. Download Kinect 2.0 SDK from Microsoft's Download Center, following all installation instructions.

    b. Place your Kinect in the optimal position and connect it to your computer and a power outlet (see above)

    c. When the download is complete, click "Kinect Studio."

    d. Select the "Monitor" tab and click the "Connect to Service" button.

        i. If everything is working, you should see a live stream of the Kinect's depth camera on the right-hand side. You can use this view to adjust the Kinect angle, check the play area boundaries, and preview the skeleton tracking.

        ii. If you do not see anything after clicking "Connect to Service," double-check the cable connections between the Kinect and the PC and restart Kinect Studio.

C. INSTALLING GAME SOFTWARE

1. Download a copy of the game from our website's download tab at http://playtheknave.org.
2. **Right click on the .exe file and select Properties. If there is a button or checkbox that says "Unblock," select it, click apply, and close the properties window.**
3. Follow along with the installer instructions, selecting the default options.
4. Double-click the game's icon on the desktop shortcut to launch it. After it loads, press the ESC key once and wait for the main menu to appear. (This can take several minutes.)

If you have problems launching or running the game for the first time after installing the software, see the troubleshooting section on "Troubleshooting Software Installation."

D. NAVIGATING THE MENU

The boxes on each menu page will prompt you to make choices for what you want to do. Just click on the boxes to make your selection.

At the bottom of the screen, you will find other **navigation buttons**:

Find out more about the team that created *Play the Knave* or link to our website.

BACK

Return to the prior menu (i.e., if you change your mind about your selection)

RESET

Clear your selections and return to the first menu to start choosing again, stopping any currently running scene.

QUIT

Shut down the game.

START

This button will appear when you have made all the possible selections in the menu and are ready to perform your scene. See section J for more information on scene performance.

E. OPTIONS FOR PLAY

The first menu offers you a range of options for *Play the Knave* gaming. Here is a brief description of the options; more details follow below.

         a) Theatre Games: this is a series of fun warm up games to get used to performing with an avatar; avatars are all robots!

         b) Perform a Scene from Shakespeare: the game is preloaded with hundreds of Shakespeare scripts, allowing 1-4 players to perform a scene from one of the bard's plays.

         c) Perform Your Own Script: you can write your own script, Shakespearean or not. Upload it, and it will appear karaoke-style just like the scripts preloaded in the game.

d) Free Play: you can play around with your avatars on the screen for as long as you would like. No karaoke script instructs you about what to say or do.

e) Warm up: In this warm-up activity, you get a feel for your avatar and some practice acting.

Theatre Games

These short games are similar to the kinds of improv games people play in acting classes, but here you will play them using robot avatars. The concept here is that you are robots learning to become actors. Descriptions of each game are available when you hover over the game title with your mouse.

Perform a Scene from Shakespeare

Choose one from among hundreds of Shakespeare scenes to perform karaoke-style. The karaoke scripts are all taken directly from Shakespeare's plays, though they have been edited slightly to make them more easily playable in the game.

1. Select your play and scene.
    a. Click on a genre to select Comedy, Tragedy, or History
    b. If you know what play you want to perform, click it, and a pop-up screen will show you the names of all the scenes available for that play.
        i. In cases where you know the number of players you have, you'll want to pay attention to that information in the scene title. Alternatively, you can click the "Filter by Player" button so that the menu shows you only scenes with the number of players you have.
        ii. Hovering over the scene name will pull up an additional pop-up window that tells you about the characters in the scene and explains key context so you know what is going on at this point in the play.
    c. If you're not sure which play or scene to choose or want some help narrowing down your options, you can click "Filter by theme." E.g., you can find scenes about love or fighting; or scenes involving singing or clowning.
    d. If you're not sure what scene to pick or just like the fun of a surprise, click on "choose for me" to have our system randomly pick a scene for you.

2. You will then be prompted to make a few more decisions about your script:
    ● "Warm up": Decide whether you want to do the warm-up activity before you perform your scene. See the description for "warm up" above for more information about the warm-up. If you select "include a warm up," you will move through the warm-up script and then right into your scene.
    ● Script version: Choose between two versions of the scene you selected. Both versions use Shakespeare's language from the original play, edited slightly to

make for a more enjoyable game experience. The "full" version is more complete, while the "abridged" version removes some of Shakespeare's more complex language to create a more streamlined script.

- Script speed: When you perform your scene, the lines from Shakespeare's script appear on screen. Decide now how fast you want to read them. For two or more players, agree on the speed that works for all.
  - Slow: Designed especially for those who need or prefer to read at a slower pace, this script speeds gives you lots of time to spend on each line.
  - Medium: This level is designed for more experienced readers or those who have mastered the slow level of this script. Unlike the fast level, the medium speed gives the player time not only to deliver the lines, but to act them out physically, moving around the stage and engaging more with playing partners.
  - Fast: for especially strong readers and those who are very comfortable with Shakespeare's language, the fast speed allows for conversational delivery of the bard's lines. Note that less experienced actors will have less time to perform physically with the fast speed.

Perform your own script

If you want to perform a script not preloaded into our game, you can write it yourself using our Mekanimator Scriptmaker program. Access it via your browser (Chrome and Firefox work best) at https://modlab.ucdavis.edu/scriptmaker/. For instructions on using the Scriptmaker, click the HELP tab on that page or download our Scriptmaker Handbook from the Download page on our website http://playtheknave.org.

Once your scene has been created via Scriptmaker and saved to the game computer, return to the game and choose the option for "perform your own script." A dialogue window will open automatically. Navigate through your computer's drive to find the file and open it. The script will automatically load into *Play the Knave*. Proceed with steps F-J below.

Free play

If you don't want a karaoke script to appear on screen and direct your avatars, you can select "Free Play" from the first menu and then proceed with steps F-J below.

When you are finished with free play, hit ESC on the keyboard to end the scene and return to the main menu.

Warm up

This short activity gives you a chance to play around with your avatar, get a feel for the play space, and some practice choosing movements that convey character emotions. You have the option to play this same warm-up activity directly before you perform a scene from Shakespeare or you can play it on its own by selecting "warm up" from the first menu.

F. AVATAR SELECTION

Once you have selected your script, you will be prompted to choose an avatar for each of the scene's characters. To select from our 30 different avatars, you can
1. Browse them all by clicking the "next" arrow on the screen.
2. Click "Filter by costume" to see avatars from a particular setting. We have three options for historical eras (Ancient, Elizabethan, and Modern) and a group of fantasy/sci-fi avatars.
3. If you're not sure what avatar to pick or just like the fun of a surprise, click on "Choose for me" to have our system randomly pick an avatar for your character.

> **TIP FOR A GOOD GAME:**
> Think about how your scene or your character might be played differently depending on the setting and avatar choice. What would it mean for Hamlet to be a Roman soldier vs. a man in a business suit? Do you want to have Lady Macbeth dressed like a woman or a man (remember that Shakespeare's female roles were played by male youths). What are you saying about the famous star-crossed lovers of *Romeo and Juliet* if you cast Romeo in an Elizabethan dress while Juliet is a robot?

G. SOUND DESIGN

In selecting your scene's soundtrack, think about what mood you want to set. You can hear a sample of each soundtrack by hovering over the selections in each category:
1. Music: this is background music for your whole scene. Like in a movie, this is a soundtrack that sets the mood for the audience but usually the characters in the scene don't hear it.
2. Atmosphere: these soundtracks help establish what the atmosphere or location for the scene is. For instance, you can decide whether you are at a ball game, in a battlefield, or in a forest at night.

As always, there's a wild card option: if you're not sure what sound to pick or just like the fun of a surprise, click on "Choose for me" to have our system randomly pick background sound for your scene.

If you would rather not have any background sound, you can select "none."

H. THEATER VENUE
Select the venue for your show. Four theaters are available:
1. Historical theaters: The Rose Theater in London (circa 1600) and the Queens' College Cambridge Temporary Stage (circa 1547).
2. Contemporary theaters: the Stratford Festival Stage, Canada's premiere Shakespeare theater in Ontario, or "The Container Globe," a replica of Shakespeare's famous globe that is currently being built out of shipping containers.

Again, you can click on "Choose for me" to have our system randomly pick a theater stage for your scene.

I. START PLAYING
Once you click START at the bottom of the screen, your scene will begin, so make sure that immediately after clicking START, players and spectators move out of the Kinect's tracking area. About 10 feet away from the Kinect camera should be sufficient.

> **TIP FOR A GOOD GAME:**
> If you wait too long to move out of the Kinect's tracking area, the Kinect may try to match you to the wrong avatar in a multi-player scene. See Troubleshooting if you get assigned the wrong avatar and want to fix this.

J. PERFORMING THE SCENE
Instructions for play and the lines for any character dialogue in the scene will appear on screen.

There are two parts to every great acting performance: voice and movement.
1. **Voice:** Each character's lines will be color coded on screen so that you know when it is your character's turn to speak. A karaoke style timer will help you pace your delivery of the lines. The lines will disappear more quickly if you chose the FAST speed and remain

longer if you chose the SLOW speed. You can read ahead to the upcoming line by looking at the small white type below the colored text.

2. **Movement:** The avatars won't move unless you do. So when you deliver your lines or listen to your playing partner(s) deliver lines, try to come up with some movements to show what your character is thinking or feeling. A few things to keep in mind:

    a. Scenes with two, three, and especially four players require a good amount of room for the actors. If players cross in front of each other, the Kinect may not be able to track them: an avatar may disappear or get switched with another player's avatar.

    b. If your avatar disappears and you are still inside the playing space, a skeleton figure will appear in place of your costumed avatar, and the white line you used to get your costume will reappear. Maneuver your skeleton to stand on the white line, and your avatar will get its costume back. Or, if you like being a skeleton, avoid standing on the white line to play the rest of the scene as a skeleton!

    c. Your avatar will be best able to mirror your bodily movements if you face the Kinect camera directly and do not cross your arms in front of your body. If you turn sideways, your avatar will move in unpredictable and sometimes hilarious ways. It is up to you whether to use this "glitch" as a feature!

    d. Your avatar may not follow you easily if you sit or lie down on the ground. If you want your avatar to do these things, consider sitting or lying on a chair or table--the furniture won't show up on screen, but your animation viewer can imagine it.

    e. There are no physical props in *Play the Knave*, so if your avatar needs to use a prop in the scene, use your imagination and gestures to pantomime what the object is or pretend it is there. Remember, too, that you can be creative in interpreting the script. For instance, if you don't want to fight with an imaginary sword, you can use your fists or another pretend weapon.

TIPS FOR A GOOD GAME:

- The better you understand the game and what the system can and can't do, the more complex your staging can be. For instance, you can make your avatar disappear on purpose and play as a skeleton (especially fun if your character is supposed to die in the scene you have chosen!). For inspiration, see player videos on our website http://playtheknave.org.
- "Glitchy" avatars are a good part of the fun of this game. It's almost impossible to get a smooth avatar performance, so instead of getting frustrated, get creative! Think about how these glitches could be meaningful for your scene. For instance, if your character is being attacked by another character, you can turn sideways or cross your arms on purpose to make your avatar go wonky.

K. VIEWING YOUR VIDEO

Play the Knave automatically creates an animated film of your performance and stores it on your computer's desktop in a shortcut folder entitled "Play the Knave videos." Just open this folder, click on the video you want to watch, and watch your video using your computer system's video player. If you delete the video, it will no longer be stored on your device.

L. TROUBLESHOOTING GAMEPLAY

Problem	Solution
The game froze.	Hit ESC on your keyboard and when the menu appears, click the STOP button. Restart the game.
The game won't load/ stop/close/quit.	Click and hold ALT-TAB. Hover your mouse over the box that appears until you see an "x" in the corner. Click that to quit the game manually. If this doesn't work, try pressing ALT-F4 on the keyboard to force-close the game. Press it once and wait a few moments.
I get an error message saying"Mekanimator.exe is not responding. If you close the program, you might lose information."	Close the program. And then restart the game by double-clicking on the game's application icon.
I tried the above options, and nothing will work.	If you can press ALT-TAB until the desktop appears, click on the windows menu and restart the computer. Otherwise, move on to the next solution.

The computer is not responding.	Turn off the computer by holding down its power button. (This is the alien head if you borrowed a Knave Kit through our Equipment Loan Program.) Once the computer has powered down, turn it on again and restart the game.
The display of the game looks odd or off-centered.	Hold down "shift" after double-clicking the game's icon on the desktop. This will bring up a launcher where you can change the game resolution to match the display.
The karaoke font size is too large or small.	With the game running, hold down the Windows key + Tab key. In the search bar, type in Chrome or whatever other internet browser you have installed. In the browser search bar, type in: http://localhost:8080/config. Scroll down to the options for "ui" and look for the "subtitle_display" section. Change the number (up or down) next to size. Click Save Settings at the bottom of the screen. Close the window. Quit the game and relaunch it. Repeat the process if the font size is still not to your liking.
The lines from the scene I chose are not showing up.	Press ESC on the keyboard. When you see the game menu, click the "RESET" button. Try choosing your options again. If the scene's lines still won't load, send us a bug report at playtheknave-help@ucdavis.edu and try a different scene.
When I double-click on the game, I get an error message saying that the game is already running.	Look at the bottom left of the screen or hit ALT-TAB on the keyboard to see other windows that are open. If you see the game running in one of those windows, either manually close that window (click the x) or select that window to open it and use the version of the game that is running there. If this message still appears, restart the computer.
My avatar is acting glitchy, and I want to smooth out its movements.	Face the Kinect camera head on; don't turn your body to the side or cross your hands and feet in front of each other.
My avatar disappeared or turned into a skeleton, and I want my costume back.	Re-enter the play space and stand on the white line to get your costume again. Once you have your avatar back, try not to cross in front of the other player.

The lines are not appearing at a speed I like.	Click ESC on the keyboard. When you see the game menu, click the "RESET" button. Choose the scene again, this time selecting a different speed level.
I got the wrong avatar when we started the game, and I don't want to play the scene out this way.	Have both players leave the play space. Then have players re-enter one by one in the correct order, making sure each player comes to the white line to receive the correct costume before the next person enters.
My avatar sometimes disappears for no apparent reason or flickers on and off, even though I have not left the play space.	If the Kinect camera also turns off when your avatar disappears, it could be that your Kinect isn't getting enough power. Try connecting your Kinect power cable to a wall socket that is further from the one you're using to power your computer. If the problem still occurs, try changing the way your computer handles power for this device: 1) With your Kinect camera connected to your computer, search your computer for the n"Device Manager" control panel. 2) Double-click on "Kinect sensor device" to reveal the "WDF KinectSensor Interface 0" and double-click on that. 3) Click on the tab for "Power Management" and <u>uncheck</u> the box "Allow the computer to turn off this device to save power." Click OK to save your changes. If you still have trouble, it's possible your computer isn't powerful enough to run the software. Check the [Required Hardware section of our Installation Guide](#) to verify.
The Kinect camera isn't turning on when the game is running. The skeletons for avatars don't appear when I step into the play area.	Check your cable connections and make sure they are tight. Then hit ESC on your keyboard to exit and restart the game. If you have downloaded [Kinect 2.0 SDK](#) (see section B, page 8), you can also check the Kinect's performance directly. Open the Start menu and search for "Kinect Studio v2.0". Click the "Monitor" tab and then click the "Connect to service" button. This will let you see from the Kinect's point of view. If nothing appears in the Monitor window on the right, try the following in order:

	1. Check the connections again and make sure the Kinect is plugged into a power source.
	2. Unplug the Kinect's USB from the computer, restart the machine, and plug it back in.
	3. Consult the [Kinect v2 troubleshooting guide]().

| Something else is happening and I'm not sure how to fix it. | Send an email to playtheknave-help@ucdavis.edu with the subject "Play the Knave bug." Describe the issue in the message body. If you can include a screenshot of the issue that helps describe the issue, please do. |
| | It's very helpful to include the game's output log. To find this, right-click on the game's icon and click "open file location". Open the folder called Mekanimator_Data and look for a text file named output_log. Right-click on this file and select "send it to the documents." Once you have it in documents, you can either drag it to a USB drive to email from your own computer. Or you can log in to your email client using Chrome on the computer and drag your file over to the email. Attaching this log in the email you send us will drastically improve our ability to help you! |

M. TROUBLESHOOTING SOFTWARE INSTALLATION

If the solutions above do not work, it's possible the software installation was not successful. Below are some known problems that can occur during installation and how to fix them.

I can move through the game menu, but when I try to play for the first time, the screen goes black and the game stalls.

If you are on a laptop, it's possible that your computer is trying to run the game using its "integrated graphics card" instead of the "dedicated graphics card." Here is how to override this if you have an NVIDIA graphics card:

1. Right click on the desktop, click NVIDIA Control Panel, and go to 3D Settings > Manage 3D settings
2. Click on Program Settings
3. Add the three programs below using the following bolded settings:
    - (Game directory)/**Mekanimator.exe**
    - (Game directory)/bin/**KinectDaemon.exe**
    - C:\Windows\System32\Kinect**KinectService.exe** (if not present)

4. Note: if you move the game's folder or install to a new location, you will have to re-apply the settings above the new executable locations! If, however, you download the latest version and install it to the same location as before, you do not have to change any settings.

If you have an AMD graphics card, the general concept is still the same. You need to specify that **Mekanimator.exe**, **KinectDaemon**, and **KinectService** are all running using the dedicated GPU rather than the integrated GPU.
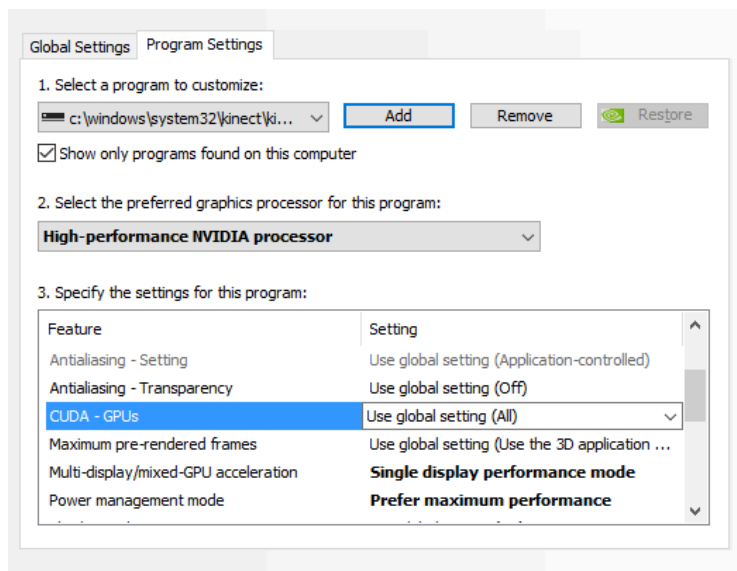
International users: If you have done all of the above and encounter the same issue, here is a short-cut fix to try:
a. Search for your computer's Region Settings.
b. Below, under Regional Format, use the pull-down menu to select "English (United States)"

I followed the instructions above, but it still doesn't work.
You may need to update your Kinect driver. Here's how:
a. Make sure your Kinect is plugged into the computer's USB 3 port.
b. Find your "Device Manager" settings on the computer.
c. In the list of devices, click on the arrow next to the one for "Kinect sensor devices" to expand it. You should see "WDF KinectSensor Interface 0" below.
d. Click on "WDF KinectSensor Interface 0" and a window will open, with several tabs across the top of it. Select the "Driver" tab.
e. Click on the option "Update Driver" to update the driver for this device.

f. When prompted, choose the option for "search automatically for updated driver software." Follow further instructions for downloading the updated driver software.
g. Restart your computer and try launching the game again.

When I go to my "Device Manager" settings, I do not see the "WDF Kinect Sensor Interface 0" that you mention above. Or I don't see "KinectDaemon" **and/or** "**KinectService" programs you mention.**
You need to install the Kinect driver on your machine. Here's how:
a. Unplug your Kinect sensor from your machine. (Important!)
b. Visit Microsoft's Download Center to download ["Kinect for Windows Runtime 2.0"](#) and click the Download button.
c. From the download location, double-click on "KinectRuntime-v2.0_1409-Setup.exe"
d. When installation is complete, plug your Kinect sensor into your computer's USB 3.0 port, making sure that it is also plugged into a power outlet via your adapter. The drivers should load automatically.
e. Restart your computer and try launching the game again.

Note: When you plug in the Kinect again, the firmware on the device will be updated. This may result in the "device enumeration" happening repeatedly for a few minutes. (A pop-up window will keep appearing, asking what you want to do with the Kinect, and when you click on the pop-up window, it shows that the driver is still uploading.) Let this process go on for a while, but if it hasn't stopped after 10 minutes, restart your computer and try running to the game again to see if you're set.

Acknowledgements: