



**SciKids**

**User Manual**

SciKids

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# 1. Introduction

This document contains instructions based on installation, troubleshooting tips, usage, and information necessary for future developers. A link to our GitHub repository can be found here:

<https://github.com/Oakheart27/Capstone>. This repository contains all project files for both the Unity editor and the standalone build. Some of the main features of our system include:

- **Interactive GUI with Gesture Support** - The main menu allows the user to navigate through the system by way of gestures.
- **Configurable Gesture Mapping** - Ability to configure gestures to perform desired actions.
- **Gamification Support** - Ability to access and play several games housed in the module. Allows for save spots and keeps high scores.
- **Dynamic Content Addition** - Future developers can add content with tools the team has provided.

## 2. Installation and Setup

Since our system is going to be used by future developers as well as anyone in the community, we have provided different sets of instructions for each.

### 2.1 Users

You can download the system using the following link: [Download SciKids Product](#) [5]

This will automatically download a .zip file. Unzip the file into your desired location on your computer, and open the resulting folder(s). You should see the following directory:

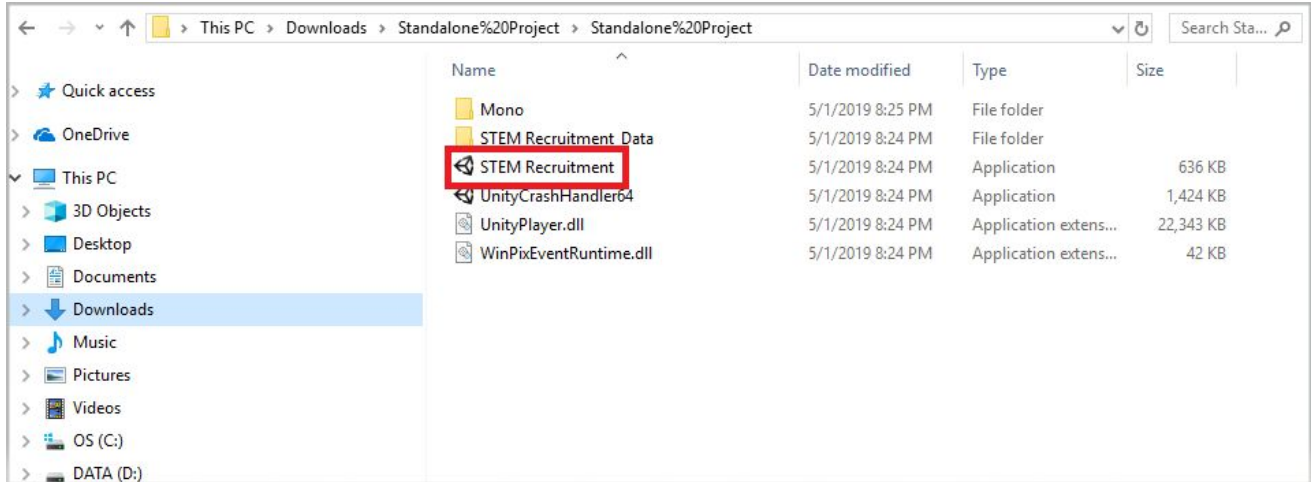


Figure 1: Standalone Folder

Before opening the application, we need to connect the Intel RealSense camera to the computer. Attach the camera to the provided tripod and connect the USB-C plug of the provided cord to the camera. Then, connect the camera to a USB-3 port on your computer. A USB-3 port on a computer looks like the following:



Figure 2: USB-3 Port

Once the camera is plugged in, you can open the STEM Recruitment application. Stand in front of the camera at a minimum of 1.25 meters so that the system can begin to read your gestures.

Depending on your computer, the USB-3 port may not be obvious. You may have to reconnect the camera to different ports to see which is compatible. You can tell that the camera is fully functional when you see small red lights in the camera's largest lens while the application is open.



Figure 3: Intel RealSense camera

## 2.1 Developers

In this section, we will assume that the developer has worked with GitHub before. If the developer has not, they can refer to [GitHub Guides](#) [1] for any help throughout this setup. That being said, we also assume the developer has downloaded Git Bash.

First, the developer will initialize a new git environment and clone the project's repository

A screenshot of a terminal window. The title bar at the top reads "MINGW64:/c:/Users/Claudia Rosas". The terminal content shows the prompt "Claudia Rosas@DESKTOP-N4DS10V MINGW64 ~" followed by the command "\$ git clone https://github.com/Oakheart27/Capstone". The terminal background is black, and the text is in various colors (green, pink, white). The window has standard Windows window controls (minimize, maximize, close) in the top right corner.

Figure 4: Git clone command

Since our product uses NuiTrack, the skeletal tracking and gesture recognition software, the developer will also need to set that up. NuiTrack has provided a set of instructions for installation on their website, which can be located here: [NuiTrack Installation Instructions](#) [3]

The developer will also need to download and install Unity. Since the product was developed using Unity version 2018 3.5 provided here is a link to install that version: [Unity version: 2018 3.5](#) [6]

If the future developers choose to update their version of Unity, we are unable to confidently say that our product will work without some work. The team will have to be cautious on behalf of updating.

### 3. Configuration and Daily Operation

When the user first opens up the program they will see a splash page with the SciKids logo and then there will be the main menu page.



Figure 5: Main Menu

From the page displayed in Figure 5, users are able to access the login screen, register an account, read about the development team, setting, and exit the program. This screen is the start of the user experience for navigating the system and accessing resources. All screens in the program are accessible from the main menu screen.

### 3.1 Create User Accounts

For users who don't have an account but would like to create one, click on the *Register* button. You will be taken to screen that looks like this.

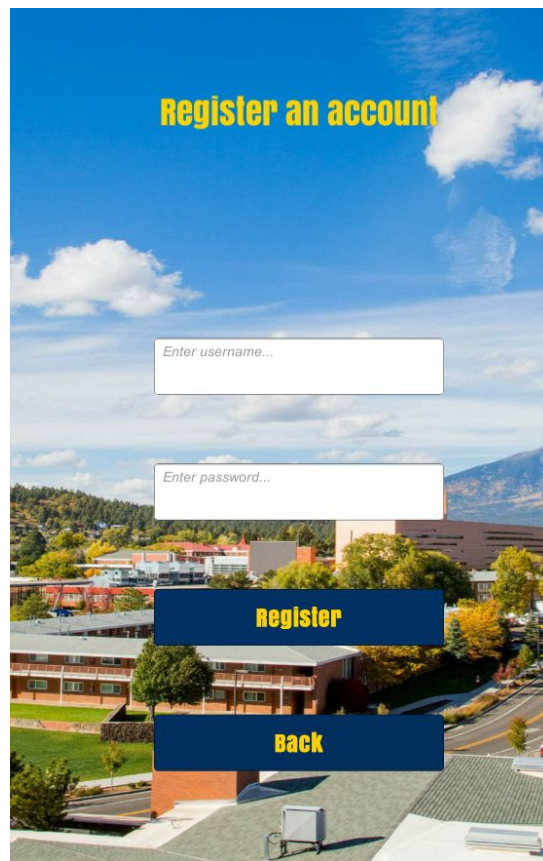


Figure 6: Registration

Fill in each text field accordingly with your chosen username and password. Then click on the *Register* button. After clicking on this button you will be taken back to the main menu screen. You will remain logged in and the login button will turn into a logout button. If you decided to log out, click on the log out button.

### 3.2 Log In

If you already have an account, type in your username and password in the text fields provided.

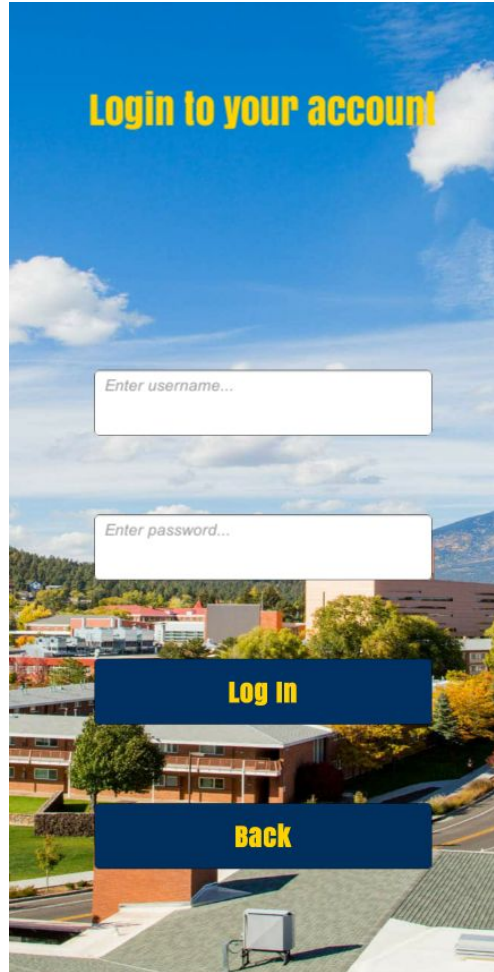


Figure 7: Log In

After you have logged in, you will also be returned to the main menu screen. If your username and password don't work look underneath the words "Login to your account" for a debug log that will tell you an error number and what the error is. The login button turns into a logout button.

### **3.3 Accesses Software Content**

From the main menu screen, click on the module button. This takes you to a screen that contains all of the current modules in the system.





Figure 8: Modules page

Click on the module that you wish to access and the content of that module will be displayed in the form of buttons. By clicking on one of the buttons, you are able to start a game or access a resource.

### **3.4 For Developers**

The software system allows for developers to create new content and add them to modules, or create a new module section and add content to new modules. The developers are expected to have some experience with Unity to aid in navigating the Unity editor for the creation of new content and then adding the content to the existing software system. The type of content added to the system should be done in collaboration with the sponsor and development team. Please note that all of the members in our team has used Windows to develop this project. Some steps may have to be modified if you have a different system.

The following directions provide information on how to add the content of another developer to the system.

- **Importing an external scene:** If you have created a scene outside of the base system and wish to import it into the STEM Recruitment project, the steps are:
  1. *Export the desired scene from your project.* On the upper menu of the Unity Editor, go to Assets -> Export Package.

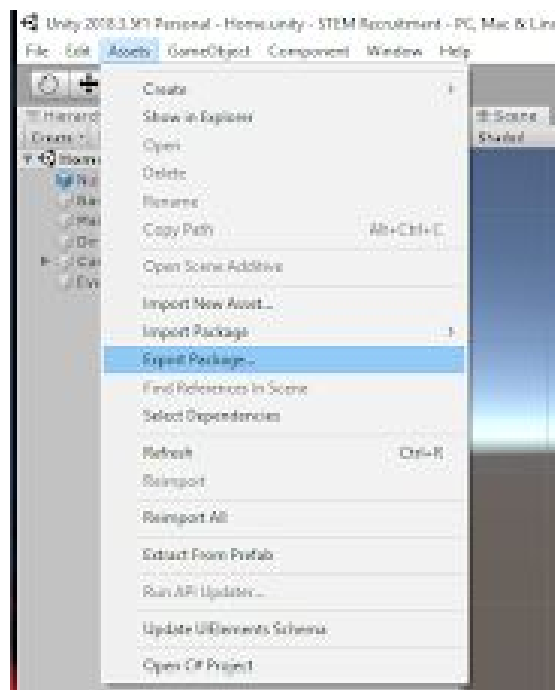


Figure 9: Export Package

Make sure to include all dependencies of the scene (prefabs, scripts, etc.). Then, click “export” and save the Unity package in your desired folder.

2. *Import your scene to STEM Recruitment project.* To do this, open the STEM Recruitment project and go to Assets -> Import Package -> Custom Package.

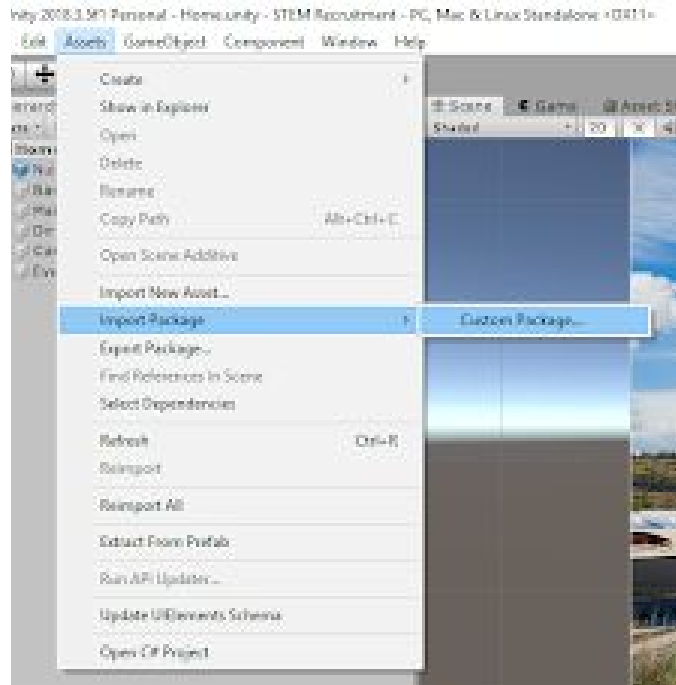


Figure 10: Import-Package

Navigate to your Unity package and import it into the project. Unity will automatically organize your dependencies into their respective folders.

3. *Add your scene to the build.* In order for the system to have access to your scene, the it must be added to the build. Open your scene in the editor and go to File -> Build Settings. Then click “Add Open Scenes”.

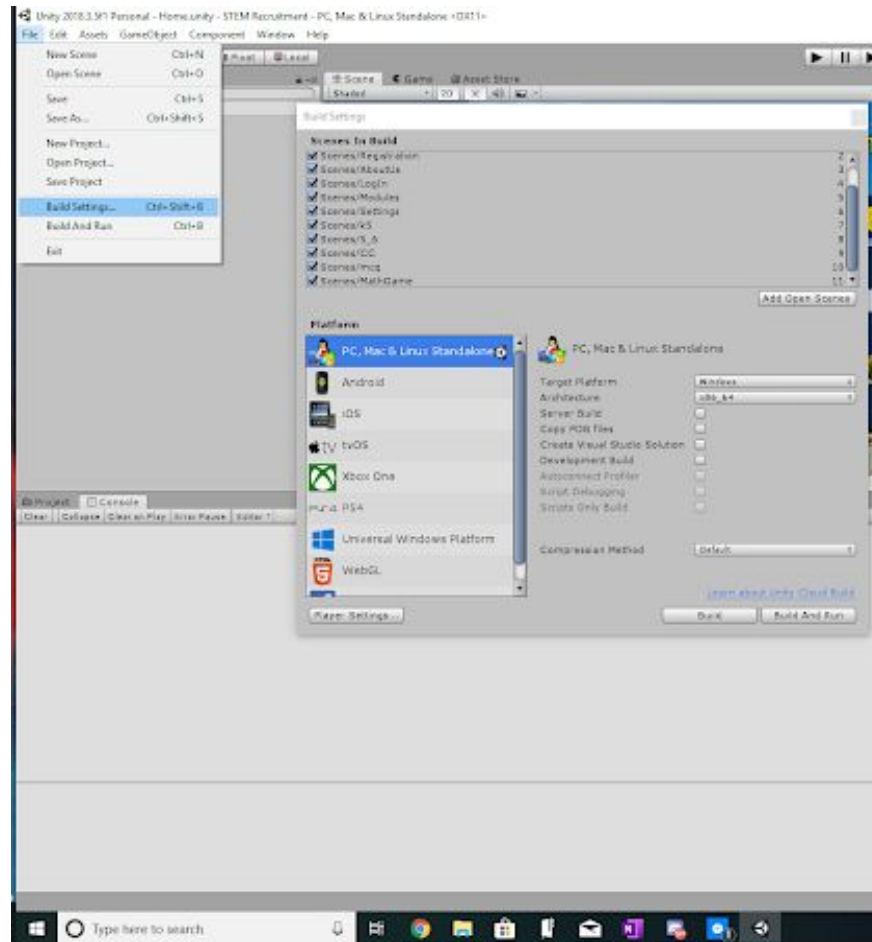


Figure 11: Build Settings

- **Connecting scenes through button.** In the Assets/Prefabs folder, developers can find a button prefab that they can use to connect scenes. The steps to do this are:
  1. *Add button onto canvas.* Open the scene from the STEM Recruitment project that you want your scene to be connected to. Drag the myButton prefab from the Assets/Prefab folder onto the canvas of the scene. This prefab contains a HoverToClick script that works with both a mouse and gesture recognition. Note that you can also change the color, text, etc. of the button prefab.
  2. *Create a new OnClick task.* In the Inspector, add a new OnClick() task. The OnClick() task needs to reference the Canvas (as that is where the script to load a scene is located). Call the function LoadSceneThroughButton.changeScene, and enter in the name of your scene into the input parameter.

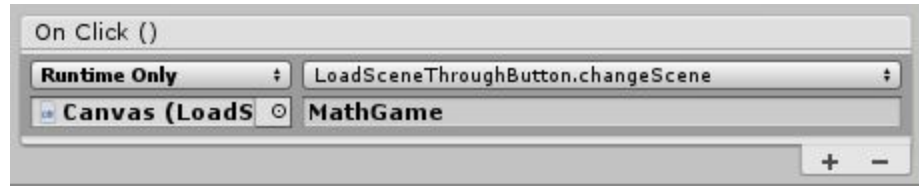


Figure 12: Managing OnClick Events

- **Adding gestures to your scene:** In the Assets/Scripts folder, a HandCursor script is available for developers to use. This script allows users to navigate through menus and click on buttons using gestures, as it maps the user's hand to the mouse cursor.
  1. *Add the HandCursor script to a button.* This can be done by either finding the HandCursor script in the "Add Component" option of the Inspector or by dragging the script onto the button in the hierarchy menu.

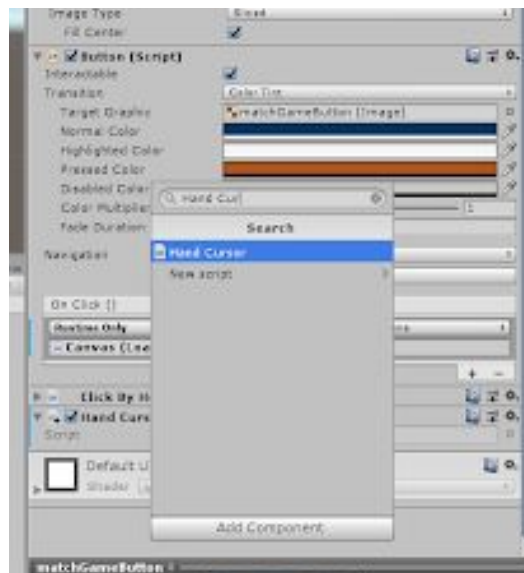


Figure 13: Adding HandCursor

2. *Add NuiTrackScripts prefab onto canvas.* This prefab is found in Assets/NuiTrackSDK/Prefabs. Add it to the scene and make sure that the Gestures Recognizer Module and Hands Tracker Module are both checked in the Inspector.

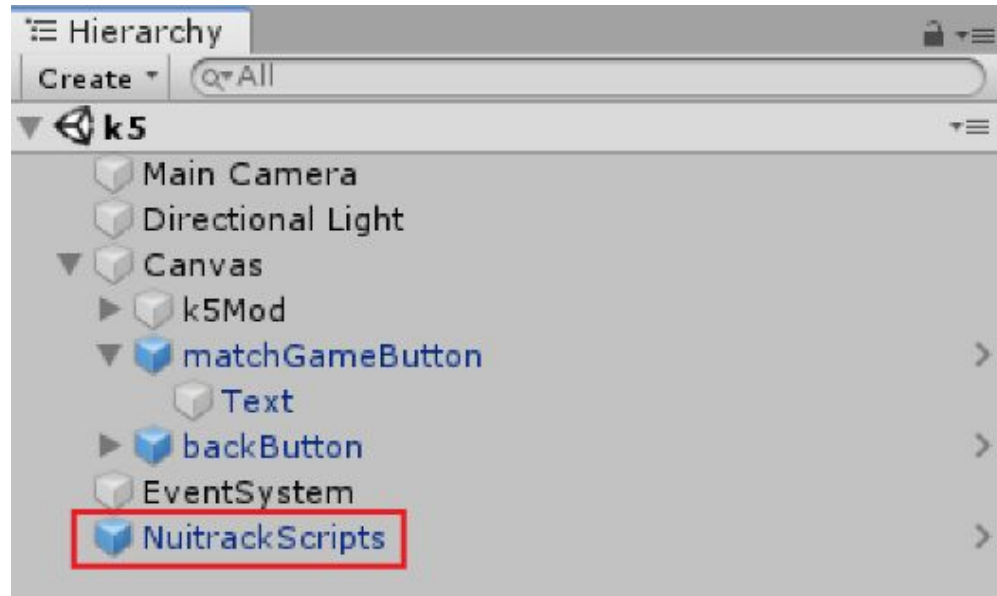


Figure 14: Adding NuitrackScripts Prefab

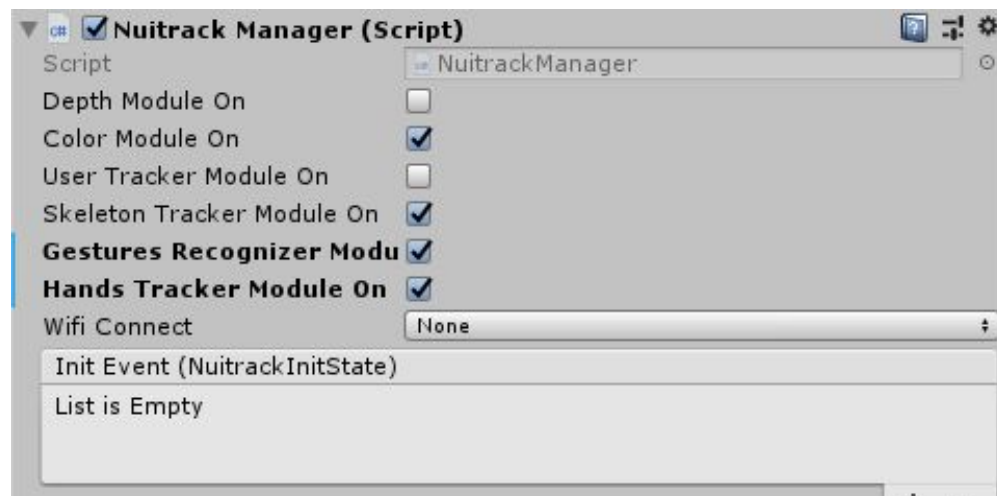


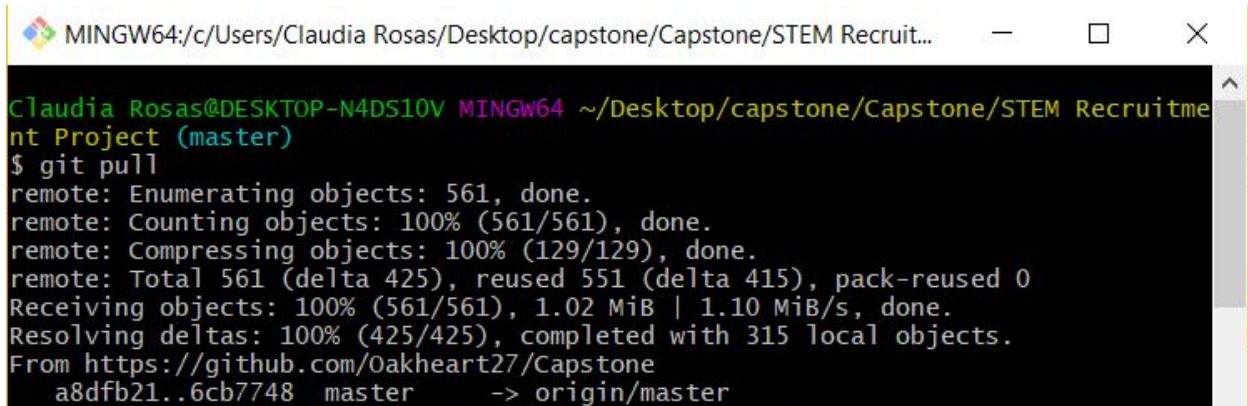
Figure 15: Nuitrack Manager

To add more gestures, please visit the [Nuitrack API](#) [2]. Here you can find tutorials using Unity along with a list of their classes, modules, etc.

## 4. Maintenance

If your product becomes out of date, the current updating process is keeping it current according to our GitHub link. As stated earlier in this manual, the version of the project is 3.5 and this is to

be changed by the developers as seen appropriate. Other than that a simple Git Pull method should keep the product updated like shown.



```
MINGW64:/c:/Users/Claudia Rosas/Desktop/capstone/Capstone/STEM Recruit...
Claudia Rosas@DESKTOP-N4DS10V MINGW64 ~/Desktop/capstone/Capstone/STEM Recruitme
nt Project (master)
$ git pull
remote: Enumerating objects: 561, done.
remote: Counting objects: 100% (561/561), done.
remote: Compressing objects: 100% (129/129), done.
remote: Total 561 (delta 425), reused 551 (delta 415), pack-reused 0
Receiving objects: 100% (561/561), 1.02 MiB | 1.10 MiB/s, done.
Resolving deltas: 100% (425/425), completed with 315 local objects.
From https://github.com/Oakheart27/Capstone
 a8dfb21..6cb7748  master    -> origin/master
```

Figure 16: Pull Project

Type all of this information into a GitBash program. A simple google search of 'GitBash' will provide several sites with download links.

## 5. Troubleshooting

### 5.1 Developers

The team has encountered some problems when downloading a build or having multiple builds on the same device. Please note that our team is using Windows to develop this project. Some of the problems are the following:

- *Undestroyable bubbles in math game.* The bubbles and user mapping in the K-5 module's math game is created using object colliders. Bubbles are set to be destroyed when a user touches them. If a bubble is not destroyed in the standalone build, a problem may have arisen in the project's dll files. In this case, create a new build in a separate folder through the editor.
- *Math game not updating the high score.* This bug may go together with the first bug mentioned. This is due to multiple builds accessing the same database. If this happens, access your AppData folder (this can be done by typing in "%appdata%" into Cortana). Go to AppData/LocalLow/Stem Recruitment. The local database is located here. Ensure that all entries in the database what is expected.

## 5.2 Users

If you are a user and experience any bugs, try redownloading the application onto your computer and deleting the old build. You can also go to AppData/LocalLow/Stem Recruitment and delete the database here. The system will create a new database the first time a user registers an account. Instructions on how to do this can be found in the previous section under “Math Game Not Updating High Score”.

## 6. Conclusion

Thank you for choosing SciKids’ product! We hope that this fits your needs and expectations. With this system, we aim to aid the recruitment of STEM individuals as well as prepare them for their future careers in the field by providing interesting and informative content for users. We expect this system to further develop in the future and continue to increase user interest and engagement with the system.

If you so wish to contact any of the SciKids team members our contact information is listed below:

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Samantha Earl - sje74@nau.edu

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## 7. Appendix A

Below is a list of websites given throughout the manual.

1. *GitHub Guides*: <https://guides.github.com/>
2. *Nuitrack API*: [http://download.3divi.com/Nuitrack/doc/UnityTutorials\\_page.html](http://download.3divi.com/Nuitrack/doc/UnityTutorials_page.html)
3. *Nuitrack Installation Instructions*:  
[http://download.3divi.com/Nuitrack/doc/Installation\\_page.html?fbclid=IwAR3cS-NXSxqZhcUYHYIwmPLVL3A3VwyloYpuYJ2GMc1gKchOzEV82UjwKdI](http://download.3divi.com/Nuitrack/doc/Installation_page.html?fbclid=IwAR3cS-NXSxqZhcUYHYIwmPLVL3A3VwyloYpuYJ2GMc1gKchOzEV82UjwKdI)
4. *SciKids Github*: <https://github.com/Oakheart27/Capstone>
5. *SciKids Project Download*:  
<https://minhaskamal.github.io/DownGit/#/home?url=https://github.com/Oakheart27/Capstone/tree/master/Standalone%20Project>
6. *Unity Version 2018.3.5 Download*: <https://unity3d.com/get-unity/download/archive>