USER GUIDE

Gesture Controller Game System

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30th October 2022

1. System Overview

Our Gesture Controller game system uses the camera to capture and analyse the user's input in real-time as the system's input instead of the traditional game taking the keyboard and mouse input of the user to interact with the game system. It will keep attracting users to play this game and can slow the speed of rising of user’s tiredness of the game.

2. USER INTERFACE

Our project’s GUI is implemented using Python. Our system provides a user login page, project information page and game-choosing page with three different gesture-controlled games.
Our system offers three different game modules, a snake game, a rocket survival game and an intelligent quiz game. The interface of the snake module displays the current map, the generated fruits and the snake. The user can change the direction of the snake in real-time by changing gestures. The interface of the Rocket Survival module will show the generated obstacles and rockets, and the user can change the direction of the rocket movement by moving his finger. The interface of the smart answer module displays the current question and the available answers. The user changes the position of the finger to select different answers. The results of all games are displayed through the game's interface.

3. Requirements

For this system, we are using computing versions and related technologies to capture and analyze user action. Here is the basic requirement for running the system.

Hardware requirements:
Device: Camera
GPU: optional
RAM: 8GB or bigger
HD: 2GB or Bigger

Software requirements:
Operating System: macOS / Windows

Application: Anaconda

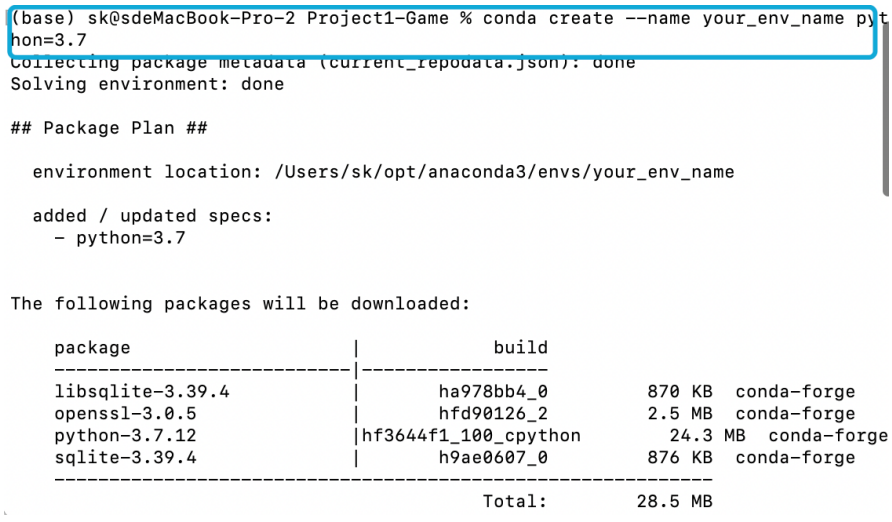
Environment requirements:
Database: MySQL
Language: Python (we strongly recommend version 3.7 for stable system performance)

4. Environment and software installation

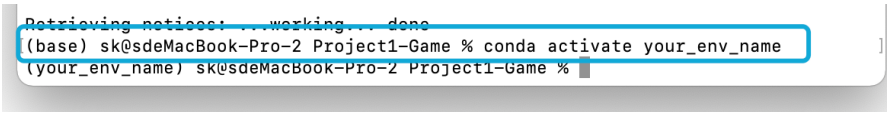
4.1 Python virtual environment installation

For this project, we highly recommend Python with version 3.7. Follow the steps below to initiate the python environment and switch to using Python 3.7.

1. Create and download a python environment
   Run ` **conda create --name [your_env_name] python=3.7** ` in your terminal



2. Switch to this environment
   Run ` **conda activate [your_env_name]** `

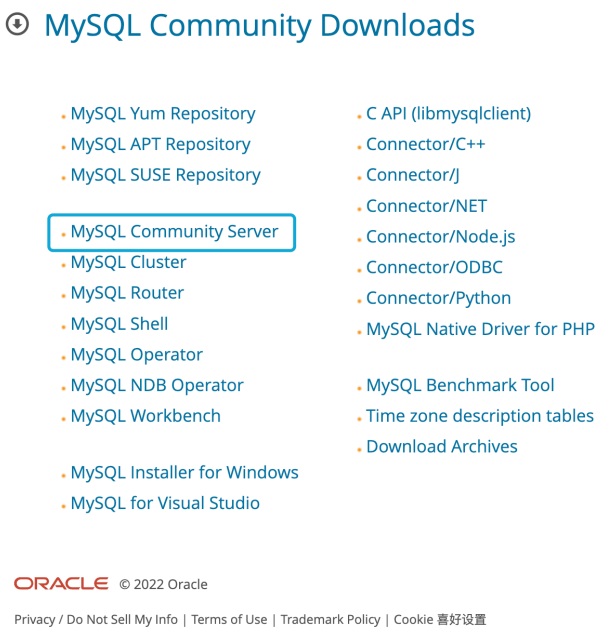


   Then you are using Python 3.7. And in the following parts, we are going to build the environment and run the system in this virtual environment.

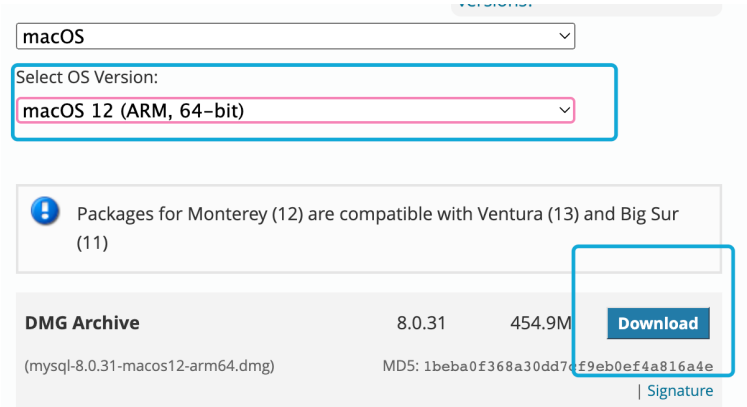
4.2 MySQL installation:

In this system, MySQL is used to store and query the answer for the 'Intelligent games' game. Follow the instruction below to set up the environment and initiate the database.

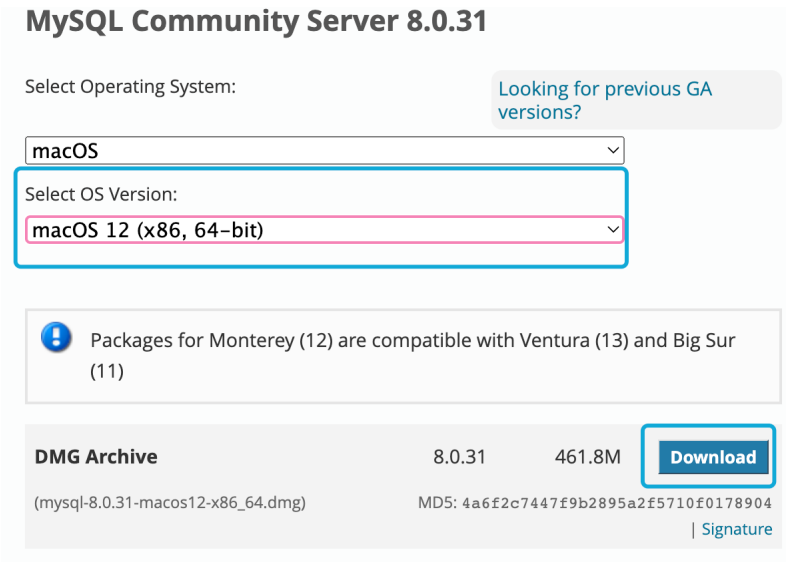
1. Get MySQL
   Rescore link: https://dev.mysql.com/downloads/
   Download the MySQL community server from this website.



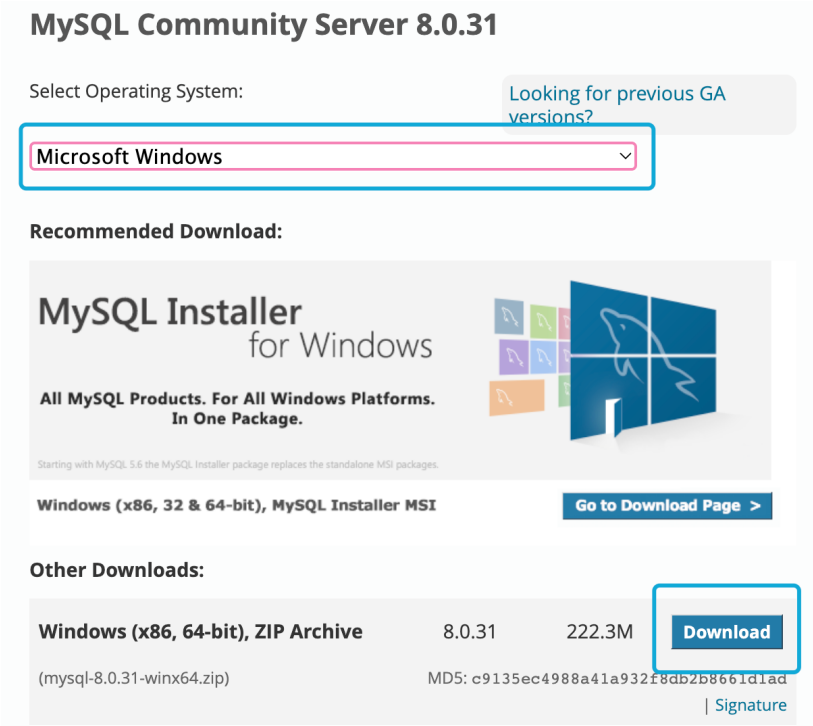
2. Choose the suitable version
   If you are using MacBook with **Chip M1**, please select ARM.



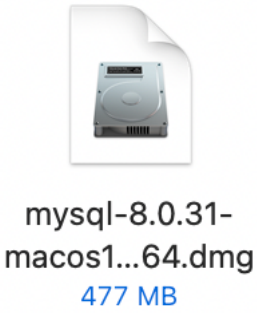
   If you are using MacBook with Intel, please select x86.



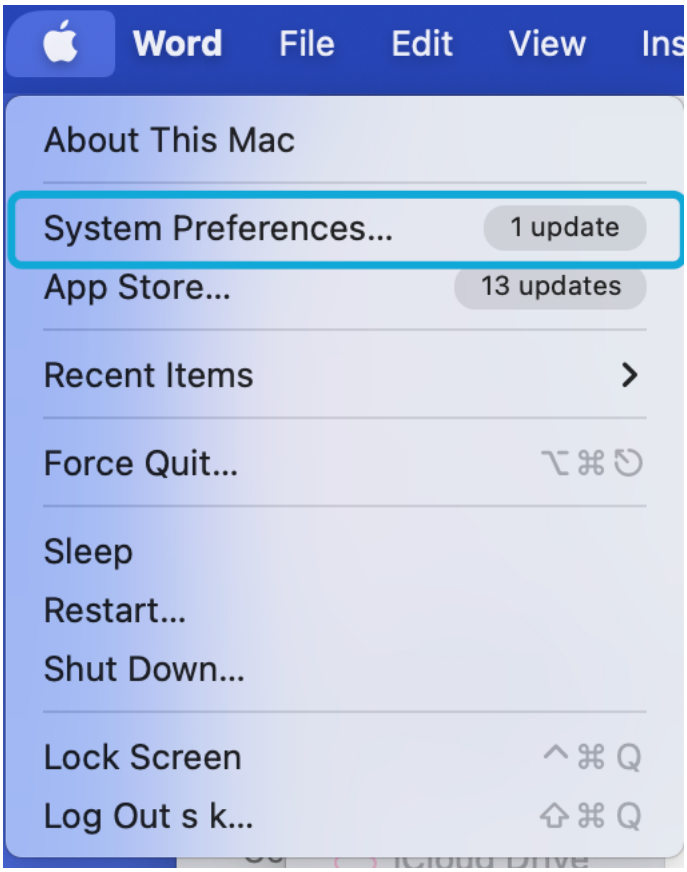
If you are using Windows, please select Windows.

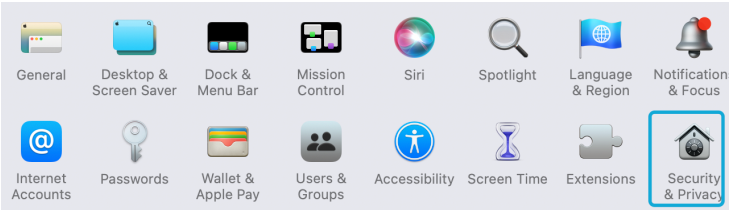


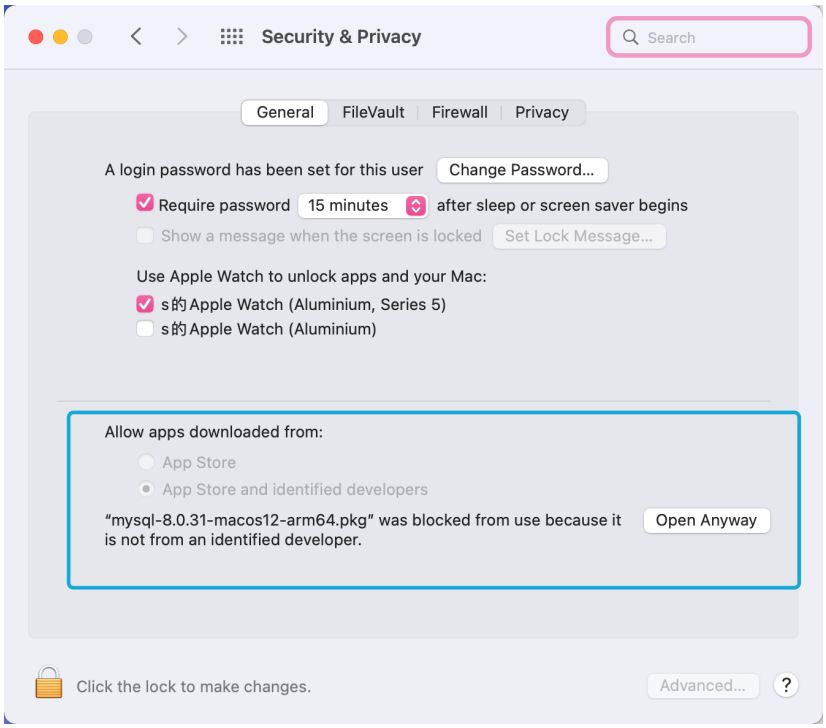
3. Start installation
   Click the DMG file

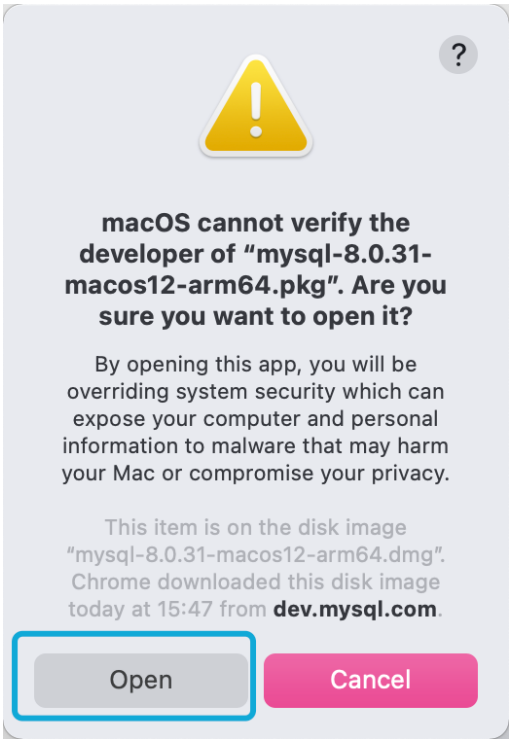


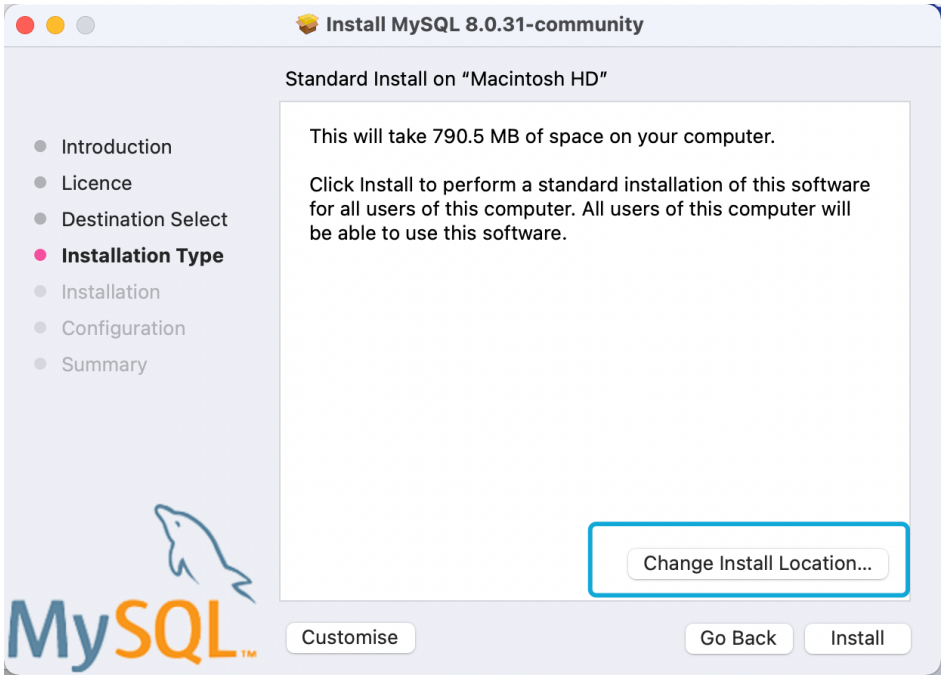
For Mac users, need to allow the extern file to be installed in the system. Go preference-Security and safety and click ‘Open anyway’. And then follow the instructions of the installer.





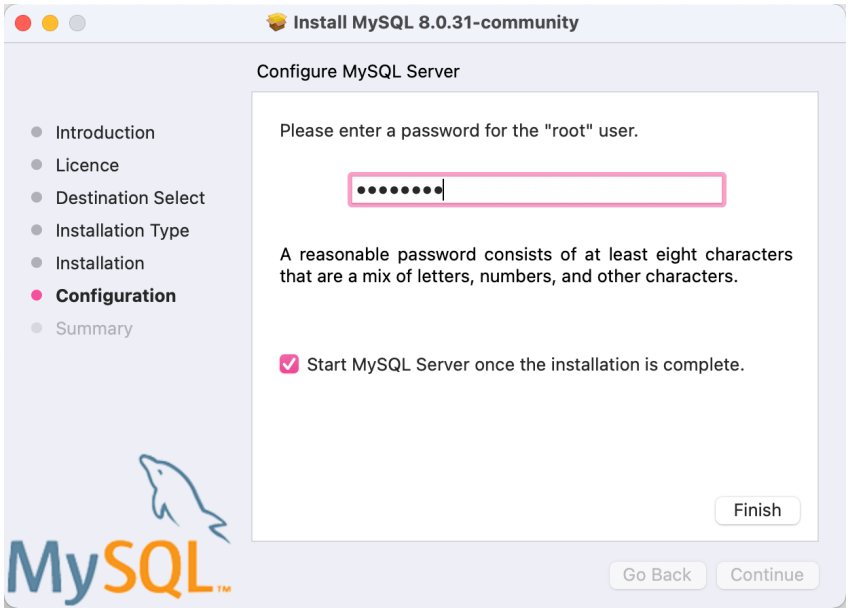

Security & Privacy
Search
General
FileVault
Firewall
Privacy
A login password has been set for this user
Change Password...
Require password
15 minutes
after sleep or screen saver begins
Show a message when the screen is locked
Set Lock Message...
Use Apple Watch to unlock apps and your Mac:
s的 Apple Watch (Aluminium, Series 5)
s的 Apple Watch (Aluminium)
Allow apps downloaded from:
App Store
App Store and identified developers
"mysql-8.0.31-macos12-arm64.pkg" was blocked from use because it is not from an identified developer.
Open Anyway
Click the lock to make changes.
Advanced...
?


?
macOS cannot verify the developer of "mysql-8.0.31-macos12-arm64.pkg". Are you sure you want to open it?
By opening this app, you will be overriding system security which can expose your computer and personal information to malware that may harm your Mac or compromise your privacy.
This item is on the disk image "mysql-8.0.31-macos12-arm64.dmg". Chrome downloaded this disk image today at 15:47 from dev.mysql.com.
Open
Cancel



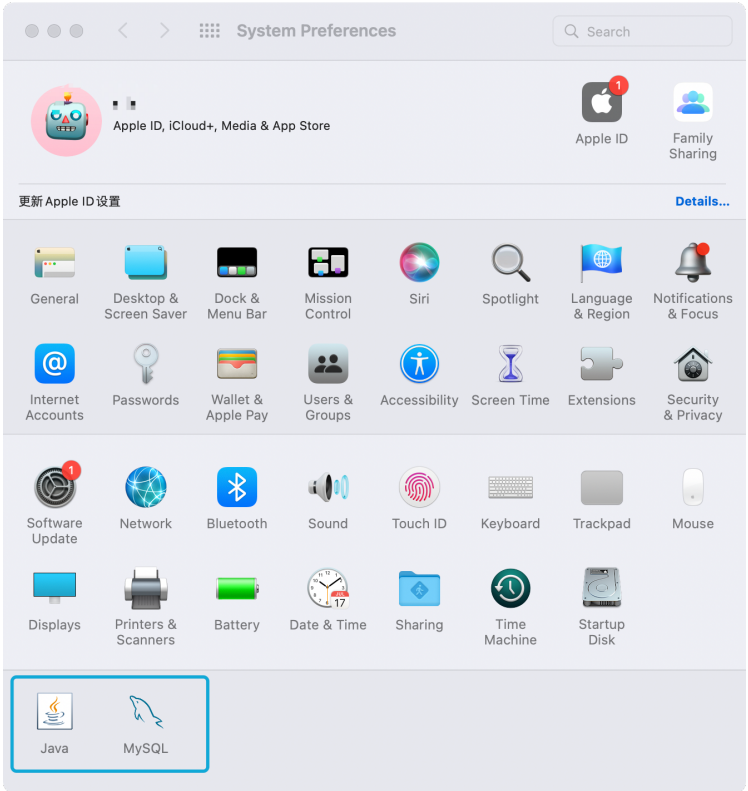
If you want to change the directory of MySQL, you can do this in this step:

4. Set the username and password
   Choose the type of password(to use the default config, please choose a legacy password and set the password as `12345678`) and do not change the username root.

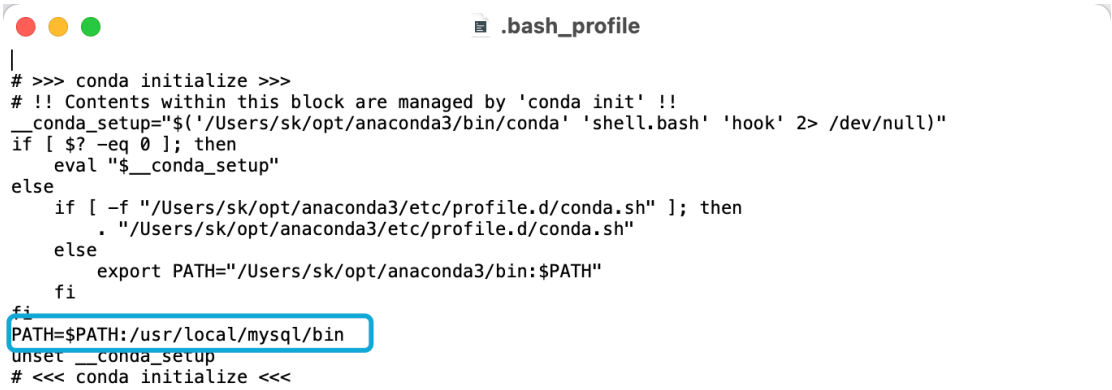


Type in your password and **REMEMBER it**. (the password will be required in the following steps). For the user who forgets the password, please uninstall the MySQL complete from your pc and repeat the former steps again.

5. Verify the installation
   Go to system preference. If MySQL is installed successfully, you will see the icon of MySQL on this page.



6. Set environment configuration
   In your terminal, run ` **open ~/.bash_profile**` and add this line ` **PATH=$PATH:/usr/local/mysql/bin**` to the file. Remember to save the change after editing.



   And run ` source ~/.bash_profile`

7. Verify the environment
   Run ` **mysql -u root -p**` in your terminal and input the password you set up before.

```
(base) sk@sdeMacBook-Pro-2 ~ % mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 8
Server version: 8.0.31 MySQL Community Server - GPL

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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql>
```

   If you can see this welcome message, configuration! The MySQL installation are finished.

4.3 Initiate Python and database

For this system, we use Python to design and develop all the models. It is annoying to install the required Python packages and import all the question data to the database. In this case, we provide a shell script to set up the whole environment automatically.

1. Run script **init.sh** in folder 'InitScript'
   Run **'sh init.sh'** in your ternimal

```
ect/lib/python3.7/site-packages (from -r requirements.txt (line 170)) (
Requirement already satisfied: threadpoolctl==3.1.0 in /Users/sk/opt/an
nvs/project/lib/python3.7/site-packages (from -r requirements.txt (line
.1.0)
Requirement already satisfied: typing_extensions==4.4.0 in /Users/sk/op
a3/envs/project/lib/python3.7/site-packages (from -r requirements.txt (
) (4.4.0)
***************Python packages all downloaded*********************

================Environment set up successfully====================
(project) sk@sdeMacBook-Pro-2 InitScript  %
```

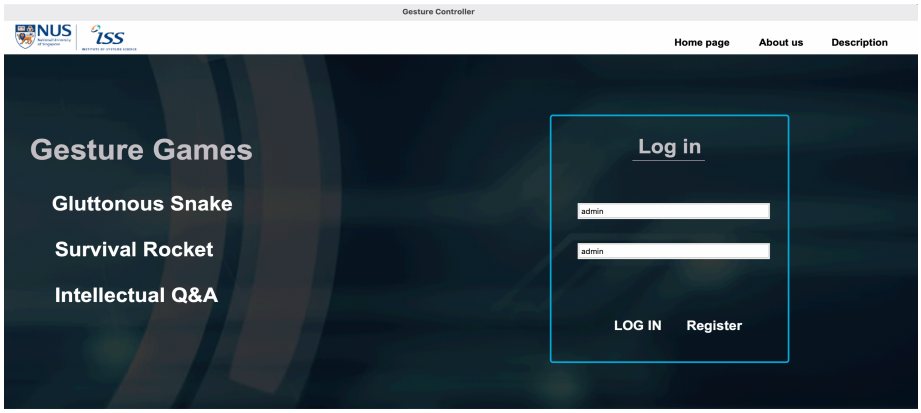
   If you can see this message 'Environment set up successfully', the environment and system are all ready to be used.

Tips: For the FAQs game, if the user wants to add extra questions to this game. Users need to run the script add_questions.py in the folder.

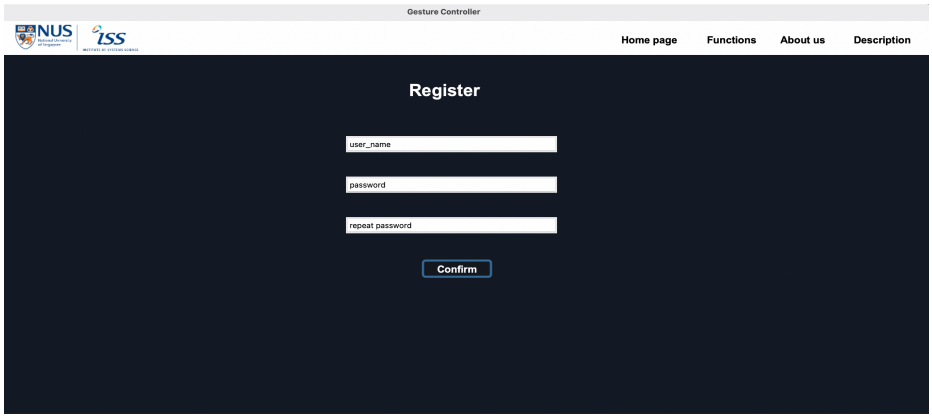
1. Add questions and answer to the game
   Run ` python add_question.py [your_question] [option A] [option B] [option C] [option D] [right answer] `

5. User Case:

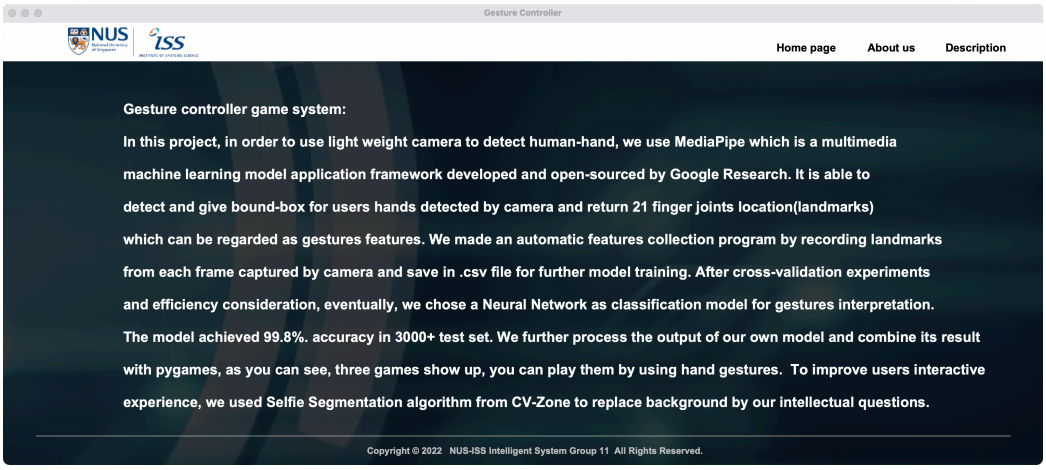
1. Start
   To use this game, users are required to register and log in first.

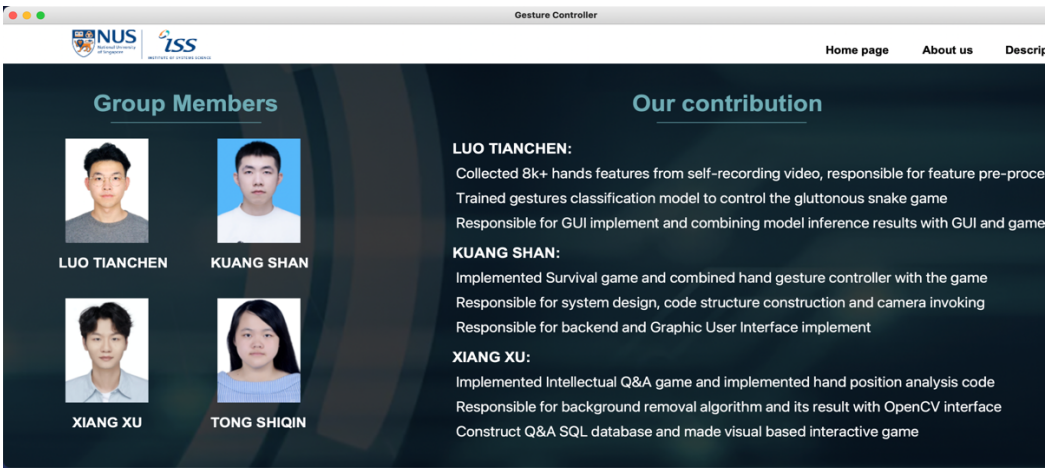


For the new user, please click register first.



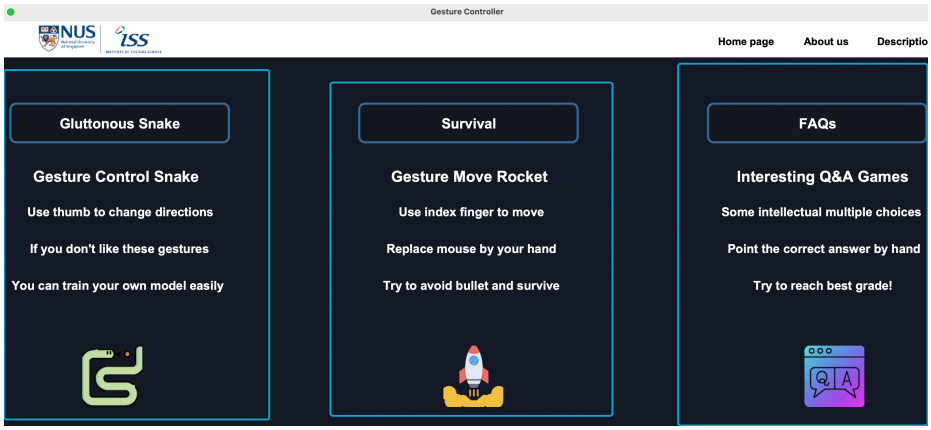
2. Users can click the button on the top to view the basic information of the game.



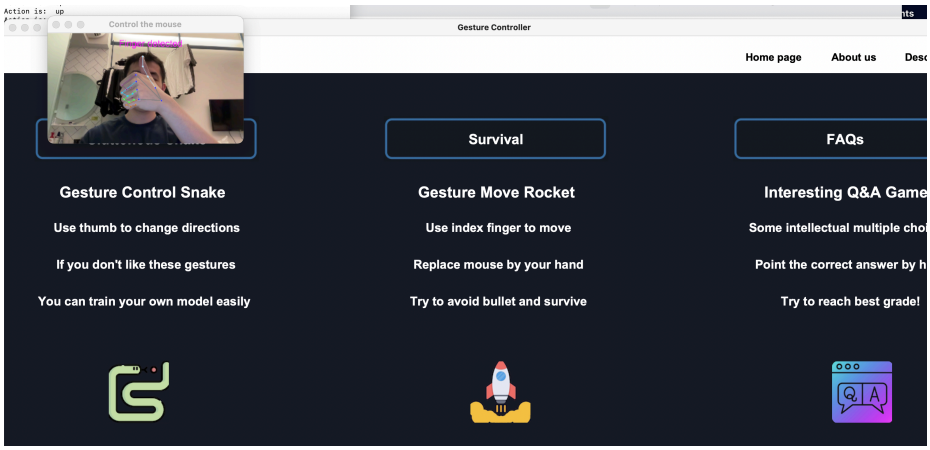


3. After log in, users can start to play the game.

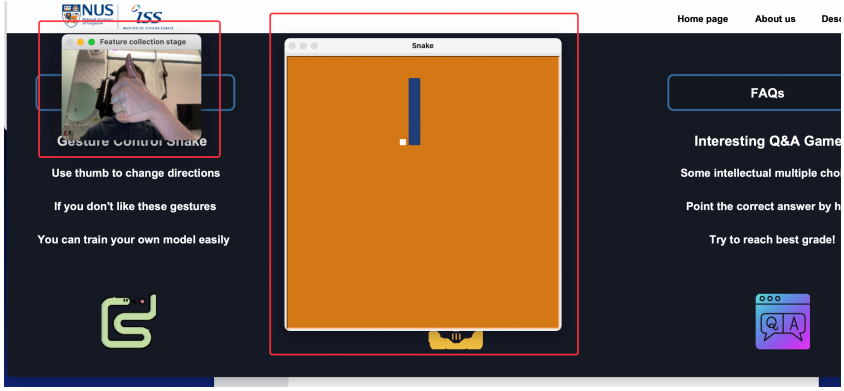
There are three different games that can be controlled by using gestures.



User can move their mouse by using their gesture.



Gluttonous Snake:
Users interact with the game using gestures to change the direction of the snake to get the fruit generated on the map.



Survival:
Users interact with the game by moving their fingers to move the rocket around to avoid the balls in space. If the rocket touches any of the balls, the game will end.

FAQs:
In this game, users choose the answer by putting their hand on the option. The game will give feedback about whether the answer is right or wrong as shown below.