Appendix F

User Manual

Eye Tracking for Simulation Assessment

This user manual will guide you to use this application

Figure F.1: Icon and front page

F.1 Introduction

Eye tracking is the process of measuring either the point of gaze (where the user is looking) or the motion of an eye relative to the head. In this project, users will watch simulations on the software. Combined with the functions of eye recognition and fixation

point positioning, the researcher analyzes the user's eye movement trajectory and derives relevant information to obtain the different concerns of users for different simulations.

F.2 Prerequisites

- This App is proven to run successfully under Windows 10 environment. However, other operating systems such as Linux, macOS haven't been proven to support this App. Please contact us before running this App if you are a user of those operating systems.
- Node.js (>12.x) should be installed before this App can run. Here is the link to Node.js official website: Node.js
- A network connection is required for this App to run smoothly.
- Hardware requirements:
  - webcam (720p or above)
  - hard disk: at least 700MB space available
  - memory: at least 8GB RAM

F.3 Usage

Figure F.2: The short cut of the application

Figure F.2 After the installation of this App, a short cut shown in figure1 would appear on the user's desktop. The logo resembles a big eye, which insinuates that this App is related to human eyes.

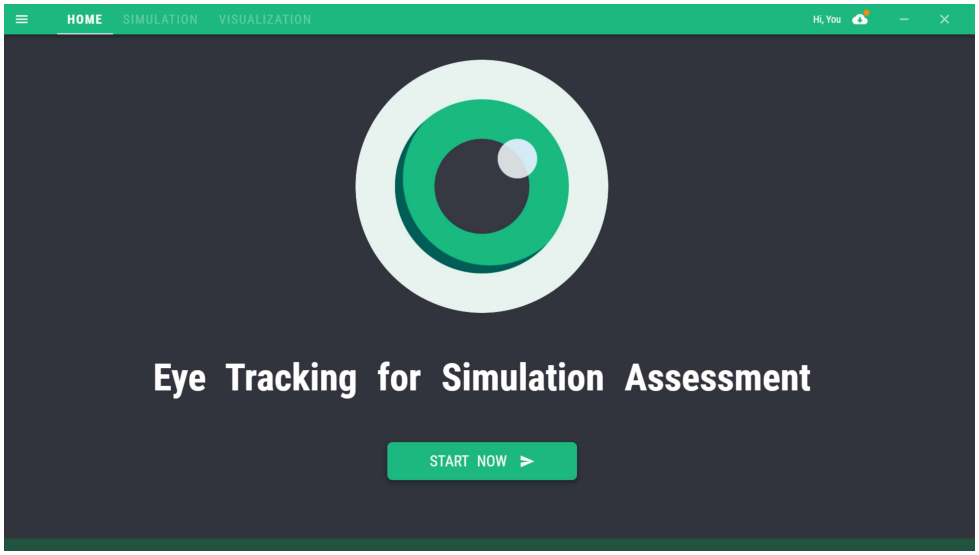

Figure F.3: Home page

Figure F.3 The home page displays the logo and the title of the project as well as a start button. On the top navigation bar, there are six buttons related to basic control functions. The leftmost hamburger links to a side drawer that manages the information about the users and the records. The "home", "simulation" and "visualization" function as routers to the 3 main pages of this App. The rightmost 2 cloud-like buttons are dedicated to downloading and uploading data between local storage and cloud storage.

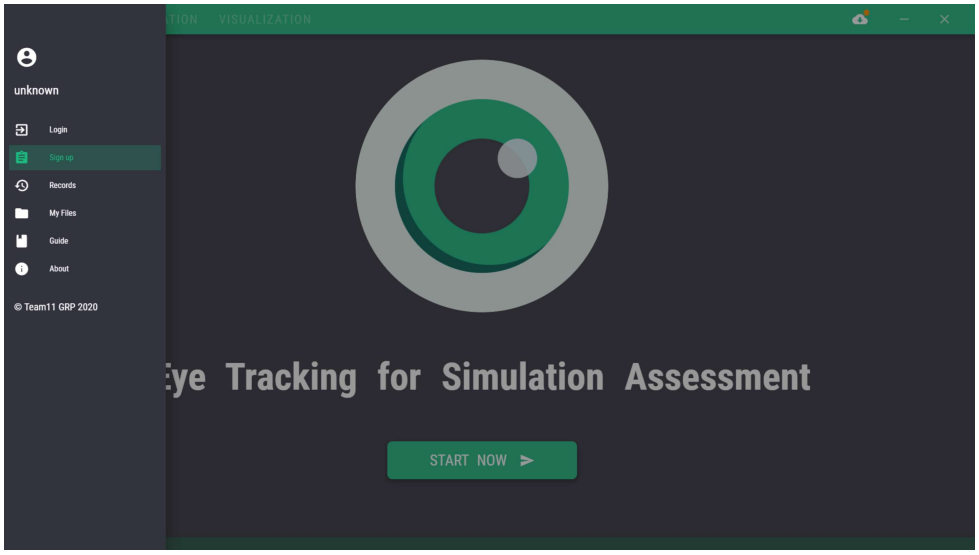

Figure F.4: The menu list related to the users and records

Figure F.4 After the leftmost hamburger is clicked, a side toolbar would appear on the left as shown in Figure F.4, which contains another six buttons.

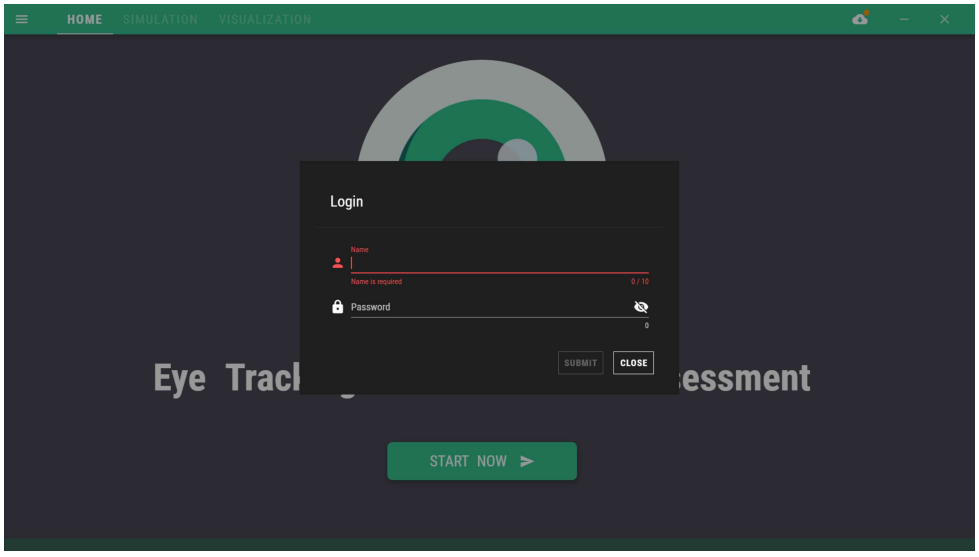

Figure F.5: The login window

Figure F.5 Click "Login", the user will see that a new dialogue pops up. The user can log in to the system by typing in the correct account and click "SUBMIT". Alternatively, he or she could click "CLOSE" to close the dialogue. It should be noticed that the text field in the form of the dialogue will turn red if the information in it is invalid or in the

wrong format.

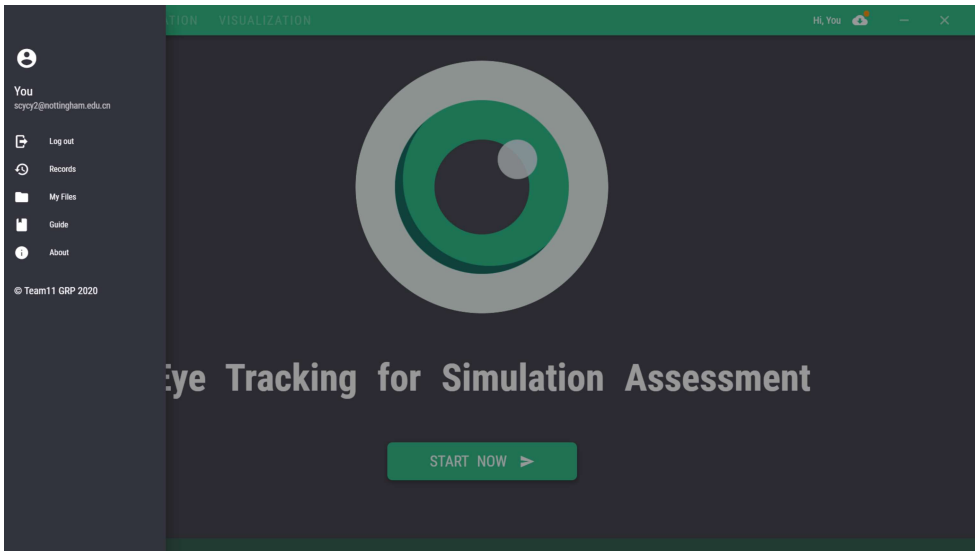

Figure F.6: The menu list with a user logged in

Figure F.6 When the user successfully logs in, nothing would change except that the original "Login" would turn into "Log out" and the "Sign up" button will disappear as shown in Figure F.6. In addition, if the user intends to log out, he or she could click the "Log out" on the sidebar.

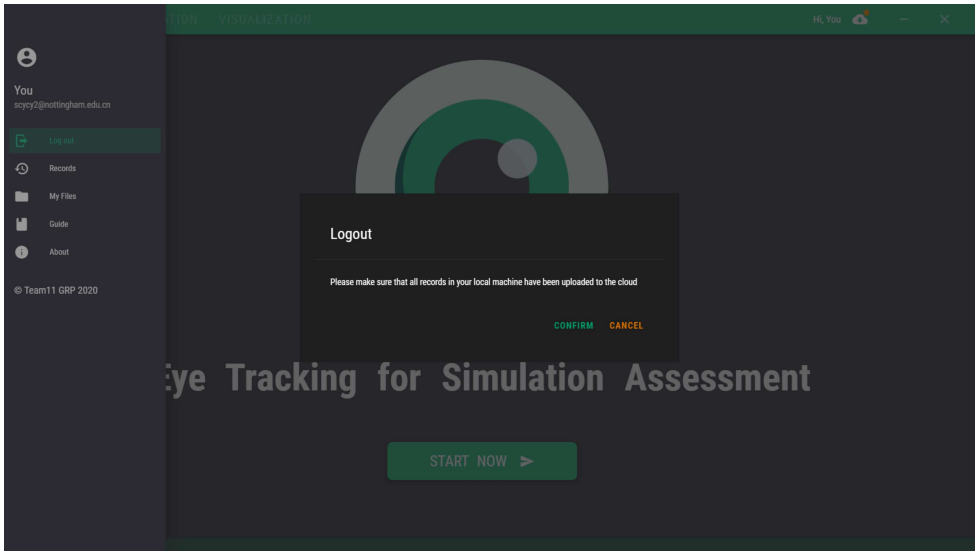

Figure F.7: The logout dialog

Figure F.7 After the "Log out" is clicked, a new dialogue will pop up to ask for con-

firmation. The user can click the “CONFIRM” to log out, or “CANCEL” to cancel this operation.

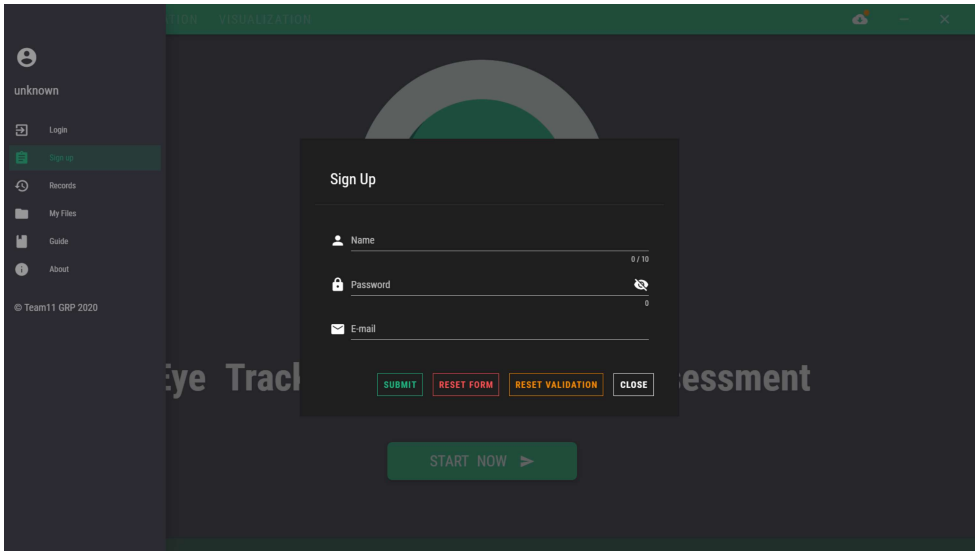

Figure F.8: The signup dialog

Figure F.8 In contrast, if a new user wants to register an account, he or she could click the “Sign up” and fill in related information. The text field in the form of the dialogue will turn red if the information in it is invalid or in the wrong format. The user can finally click the “SUBMIT” to create a new account and log into the system directly. In addition, “RESET FORM” would be the choice if the user wants to reset all the fields. If the user merely wants to clear the inappropriate information, he or she could click the “RESET VALIDATION”, which is more efficient than clearing the fields one by one.

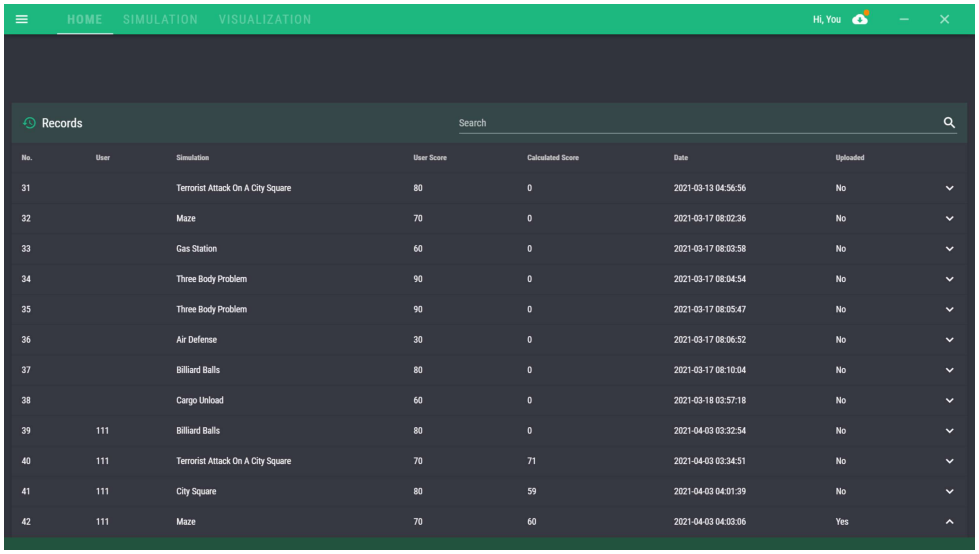

Figure F.9: The records table

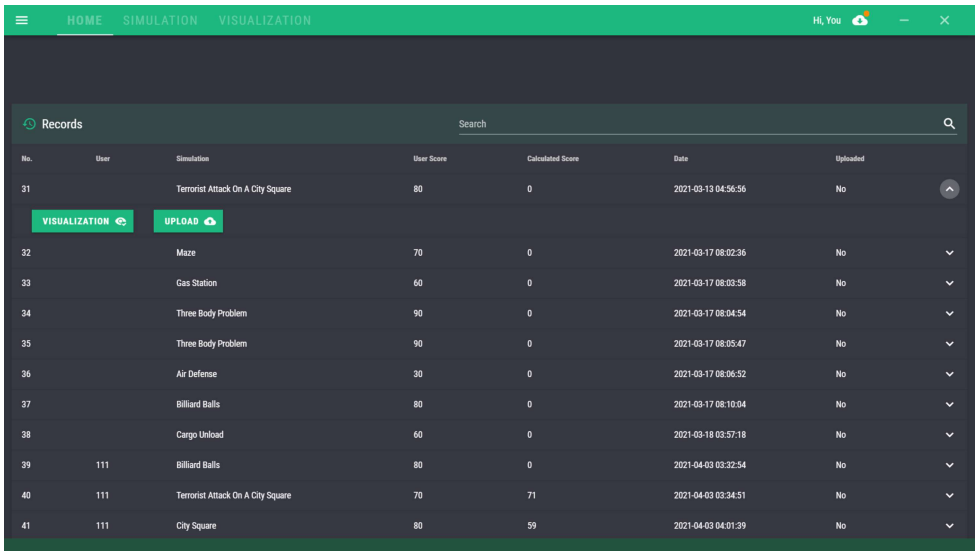

Figure F.10: The table item with visualization option

Figure F.9 & Figure F.10 If the "Records" in the sidebar is clicked, a list of the previous records will be shown with the names of simulations, user scores, calculated scores, date as well as synchronization state. If the user clicks the rightmost expansion arrow appending each record item, the "VISUALISATION" button and "UPLOAD" button will appear as shown in Figure F.9. The "VISUALISATION" button would bring the user to the same page as the "VISUALISATION" on the top menu bar. The main difference between them is that this one in the table is to display the visualization of a specific simulation, while the one on the top is to display the visualization of the simulation that

the user has interacted most recently. If the user clicks this button, the App will jump to the page of the visualization of the eye tracking part as is shown in Figure F.17 and Figure F.18. And users are able to upload the dataset by clicking “UPLOAD”.

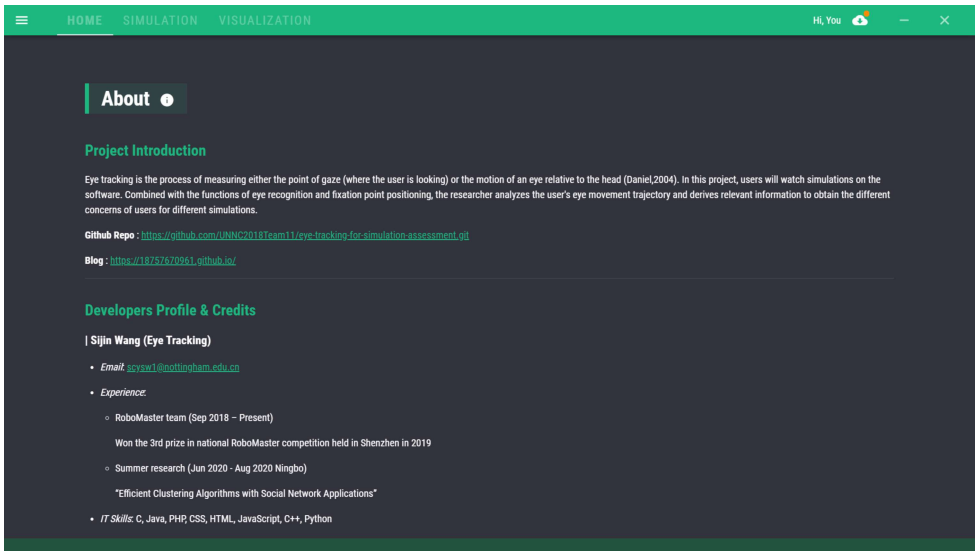

Figure F.11: Detailed information on this application

Figure F.11 The user could click the “About” to view detailed information on this application.

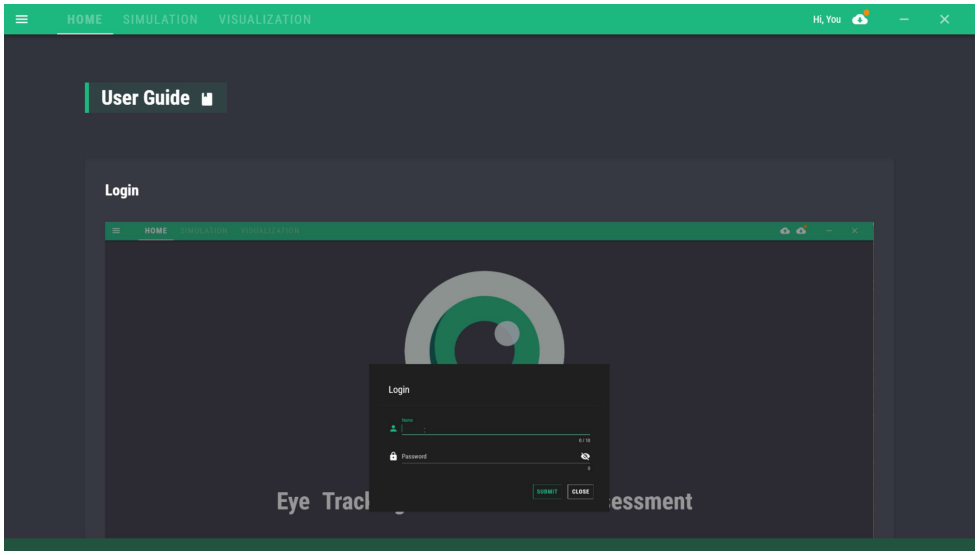

Figure F.12: The guidance of this application

Figure F.12 If the user clicks “Guide”, detailed guidance will appear to help the user,

especially the fresh ones, to get familiar with this application.

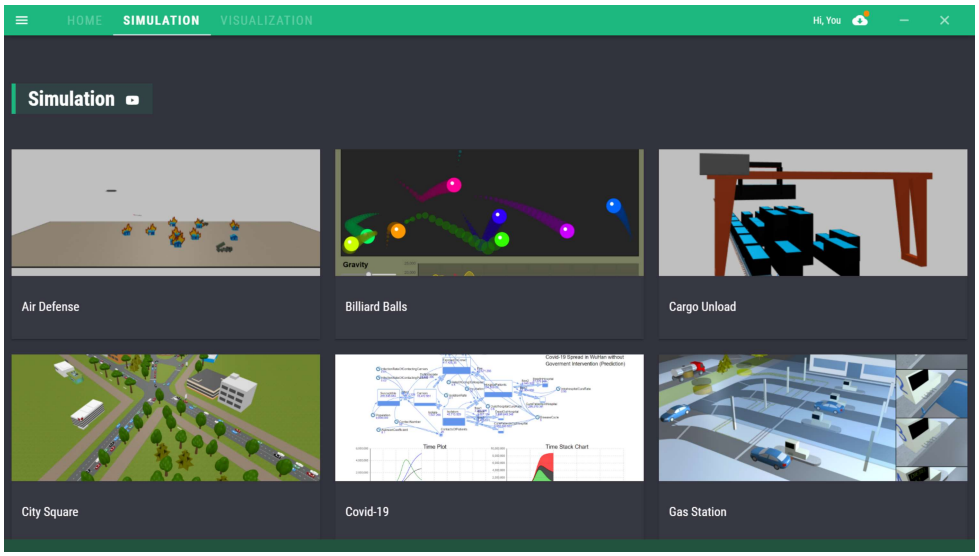

Figure F.13: The simulation menu

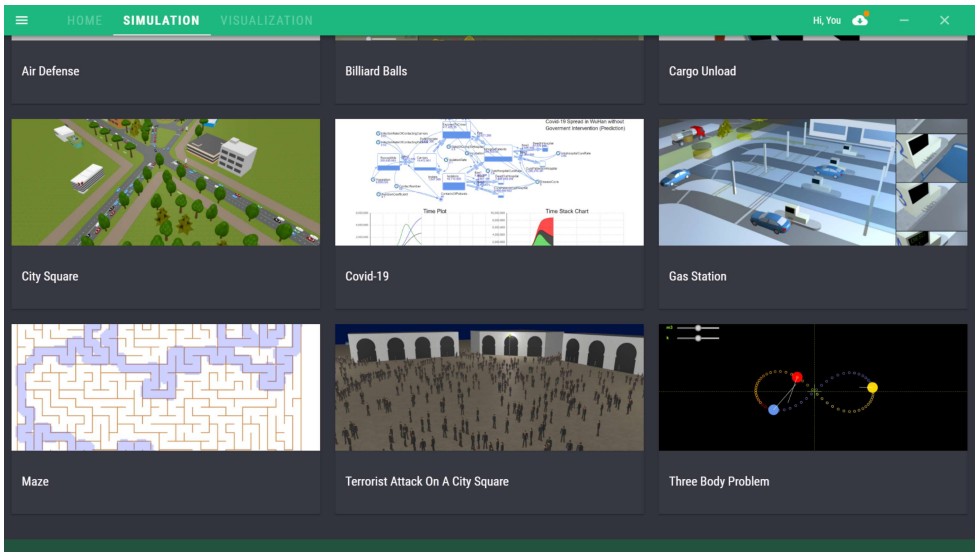

Figure F.14: The simulation menu

Figure F.13 & Figure F.14 If the user clicks the "SIMULATION" on the top, the App will jump to the page of the simulation library which contains nine different simulations as is shown in Figure F.13 and 14.

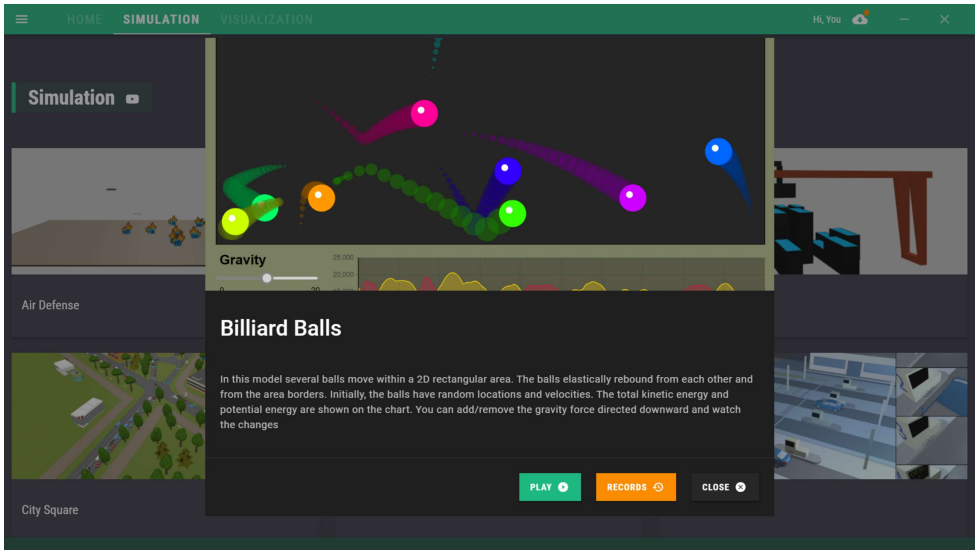

Figure F.15: The introduction of the simulation

Figure F.15 Once a simulation is clicked, a new dialogue would pop up which contains a brief introduction to this simulation. The user can simply close the dialogue by clicking "CLOSE". The user can click "RECORDS", the records of this simulation will be shown right away and the user can also choose to visualize one of them by clicking "VISUALISATION".

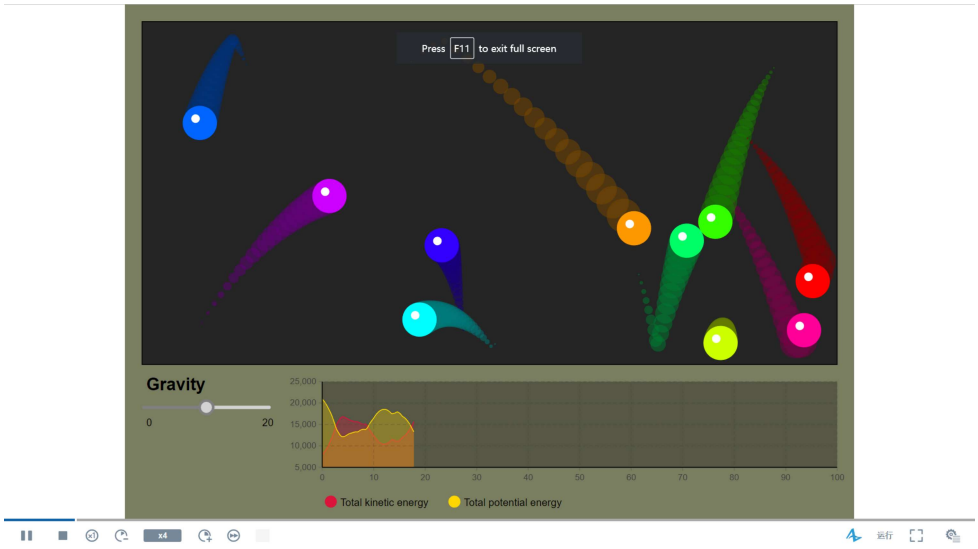

Figure F.16: The simulation player

Figure F.16 If the user clicks the "PLAY" button, a video of this simulation would start

to play. The user is unable to halt the video until the video finishes.

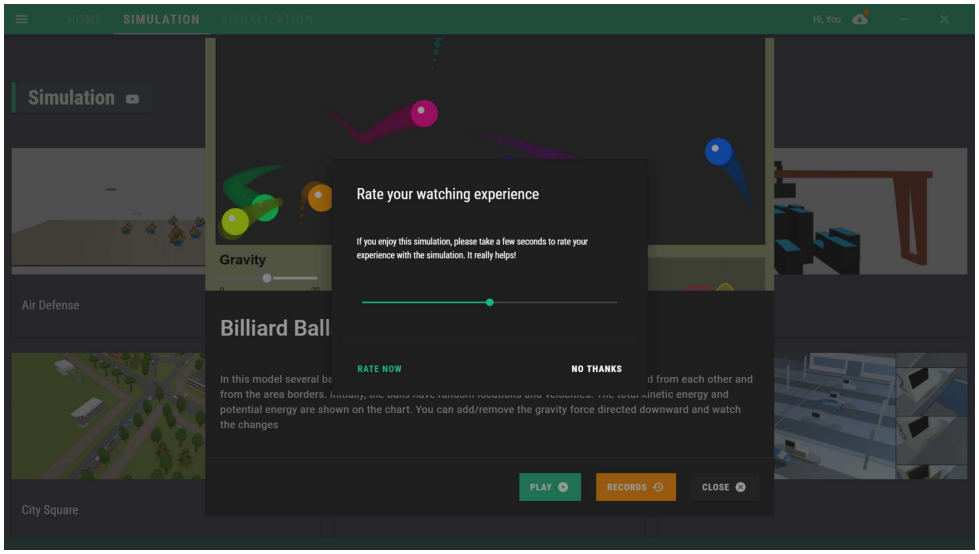

Figure F.17: The rating dialogue

Figure F.17 When the simulation finally stops, a rating dialogue will pop up asking the user to score the simulation according to the performance of the simulation. The user can choose "RATE NOW" to rate it or click "NO THANKS" to close the dialogue.

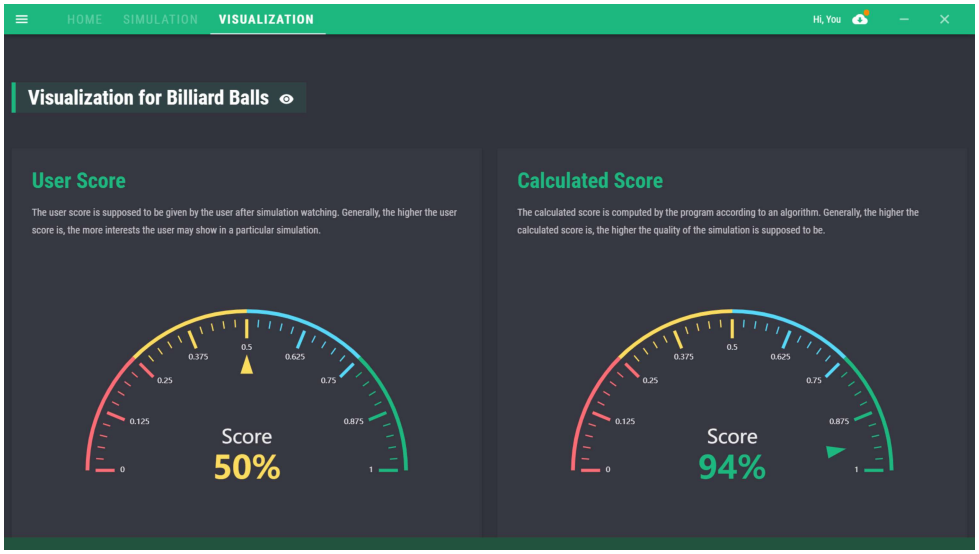

Figure F.18: The visualization page

Figure F.19: The visualization page

Figure F.18 & Figure F.19 If the user clicks the "RATE NOW" button, the window will jump to the visualization page and display the score marked by the user as well as the score calculated by the system from a large set of eye tracking data. In addition, the graph displays the gazing point during the watching time as is shown in Figure F.18. Each square of the graph is an area of the detected gazing points while the number in the area is probably the seconds of the user gazing at this specific area. These data are calculated by the eye tracking program running in the back end with specific math methods.

Moreover, the user is able to navigate back to watch another simulation or navigate to the home page by simply clicking the button on the top menu bar.