WWW Technologies and Applications 2025

Assignment 2 – JavaScript and DOM

TA: Albert (Email: chichonglee01@gmail.com)

Deadline: 11:59 pm, April 10, 2025

➢ ATTENTION

Please follow all the specifications below, or you will get a deduction or a zero score.

1. You are required to build a playable maze game by using JavaScript and DOM.
2. Implementing maze functions is a crucial requirement in this assignment. You are not restricted to using any CSS style, but you must have a hover effect whenever a menu item or a button is hovered. You are free to design any other visual effects as your preference.
3. Do NOT copy others' work, or you will get a zero score.
4. You should link your homework2 button on the page you completed for Assignment 1 to this assignment. If not, this assignment will NOT be graded.

➢ DESCRIPTION

In this assignment, you need to build a playable maze game, where a player can use a keyboard to control an icon at the start point and move it to reach the designation. You can refer to the following website: https://github.com/devression/Maze-Game, and the features should be restricted as follows:

1. The layout of the home page:

Figure 1 displays the design of a functional maze game that should correctly display on the center of the page. As shown in Figure 2, the two dropdown menus (events and difficulty), the start button, and the replay button (green arrow button) should have an effect respectively while your cursor hovers. The two slider buttons (foggy mode and recording mode) should have a transition effect respectively while you turn on and turn off the buttons. Specifically, you need to change the color of the slider buttons as it scrolls. All the necessary materials *(i.e.*, fog.jpg) required for the project can be found on eCourse2, or alternatively, you can use your own materials.

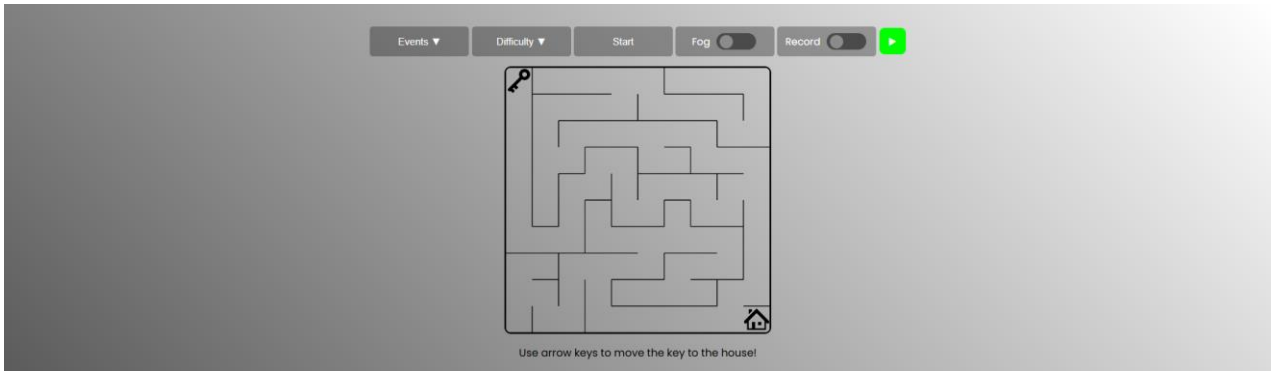

Figure 1. Maze game layout

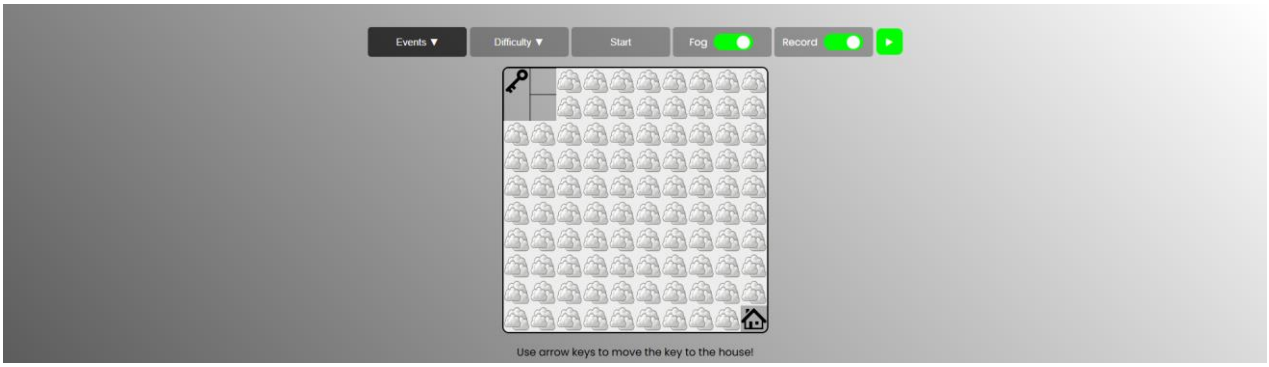

Figure 2. Dropdown menu hover effect and slider button transition effect

2. The maze game display and functions

The maze game is made up of two main parts: the functionalities and the maze rules. The functionalities include two dropdown menus (events and difficulty), a start button, two slider buttons (foggy mode and recording mode), and a replay button as shown in Figure 3. The maze including a start point (represented by a key icon), destination (represented by a house icon), and a maze map generated by a DFS searching algorithm as shown in Figure 4. The start point and destination are randomly generated at the opposite ends along the diagonal of the map.

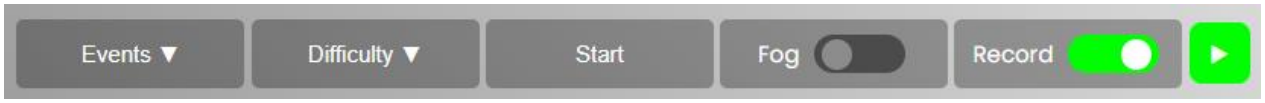

Figure 3. Maze functionalizes

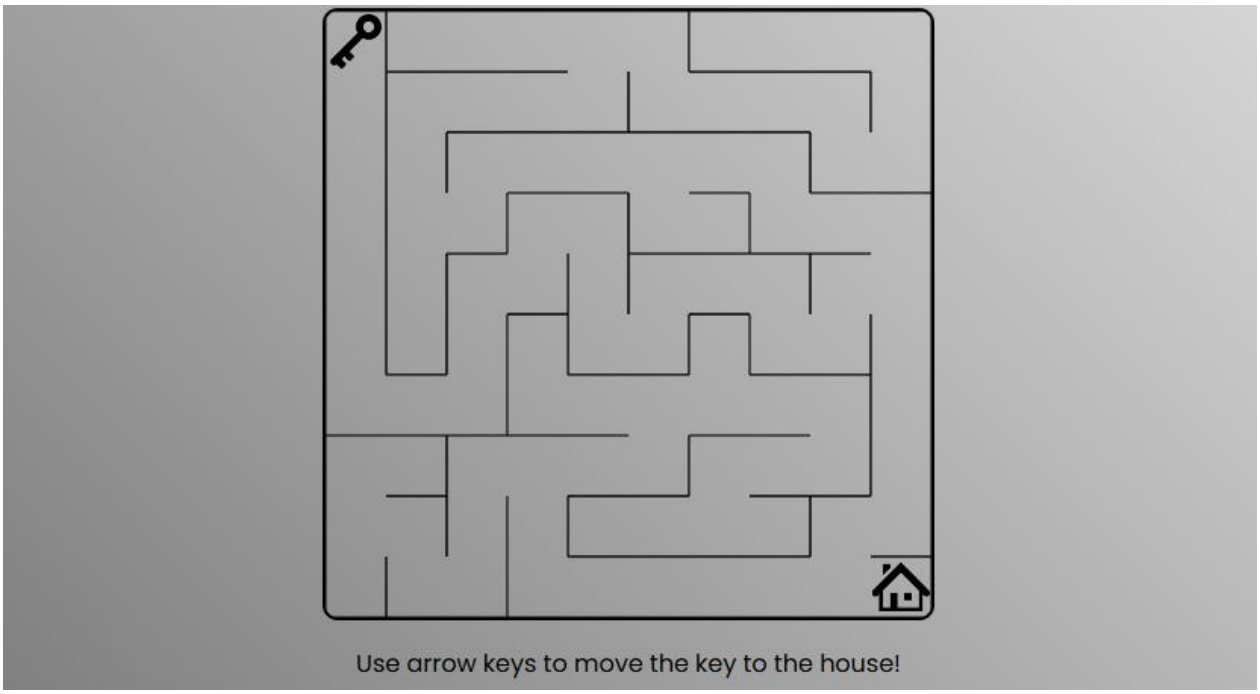

Figure 4. Maze map

2.1 Maze functionalities

[1] Event quantity selection

Players can adjust the number events in the maze by the dropdown menu. The number of events ranges from 0 to 8 (with the default set to zero), and an event is triggered when player stands on an event image (shown as a dice.png). As one example is shown in Figure 10, you need to display the selected event quantity in place of the dropdown menu after a quantity is chosen, and five dices randomly on the maze.

[2] Difficulty settings

The difficulty of this game contains four sizes: 10*10, 15*15, 25*25, and 38*38 (the default is set to 10*10). A player needs to click the start button to generate a corresponding size of the maze when the difficulty is set, as shown in Figure 5 and Figure 6. Furthermore, a player can press a start button to re-generate a new map given the current setting.

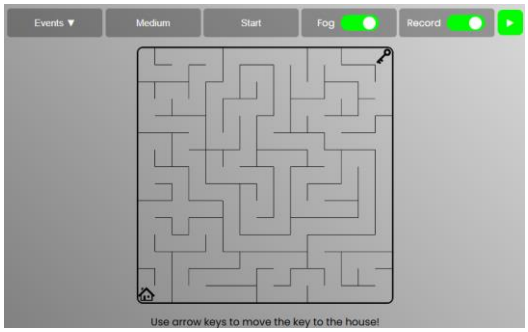

Figure 5. Difficulty = Medium

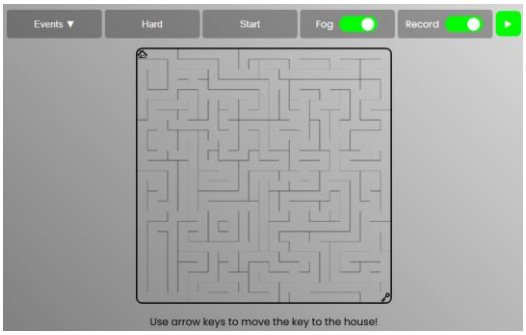

Figure 6. Difficulty = Hard

[3] Start button

This button is used to updating the difficulty of the maze and generating a new maze corresponding to the maze size that is set.

[4] Foggy mode

The maze is covered a layer of fog while turning on the foggy mode. The fog should cover all the map, except on (1) the 2*2 area when the player stands on the start point (see Figure 7); (2) the 1*1 area at the destination (see Figure 7); (3) the 3*3 area of the player's vision, when the player is at a non-border position (see Figure 8); (4) the 2*3 area or 3*2 area, when the player walks along the top-and-bottom border and the left-and-right border, respectively (see Figure 9).

***** Note *****

After the player moves out the start point, preserve the 1 * 1 area at the start point as shown in Figure 7 to Figure 9.

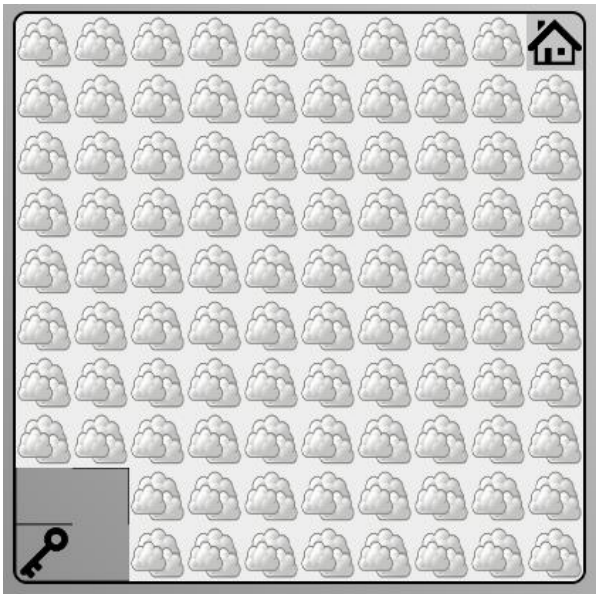

Figure 7. Initial case

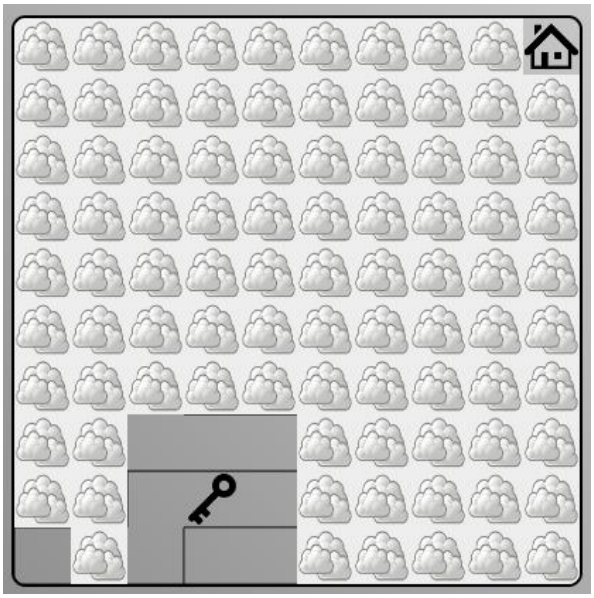

Figure 8. The 3*3 vision area of the player who is at a non-border position and the preserved 1 * 1 area of the start point

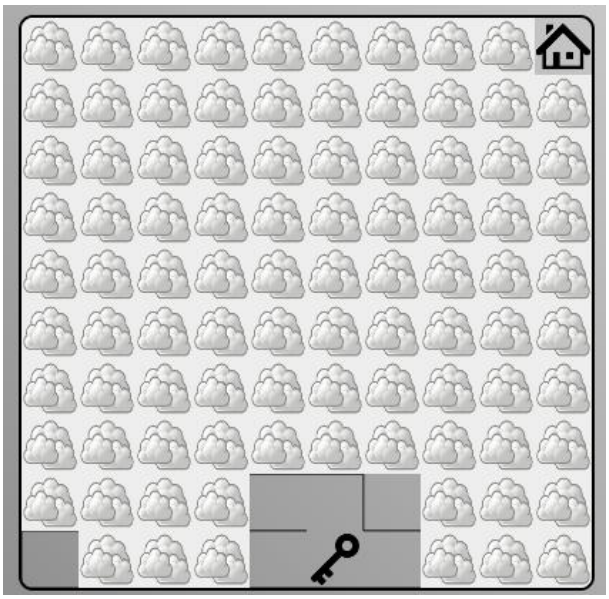

Figure 9. The 2*3 vision area of the player who walks among the bottom border

2.2 Maze rules

There are two different ways to play the maze:

[1] On the unfoggy mode

Figure 10 is shown how the events are displayed on the unfoggy mode. In this example, there are five events, defined in events.json file (which can be found on eCourse2), containing four types of events: (1) vision enhancement (5*5 vision), (2) vision restriction (1*1 vision), (3) passing wall a time, and (4) returning to the start point and clearing the path records. Once the player has walked onto one event, it triggers one of the four event effects randomly and have an alert window to illustrate what the effect of the event is, as shown in Figure 11.

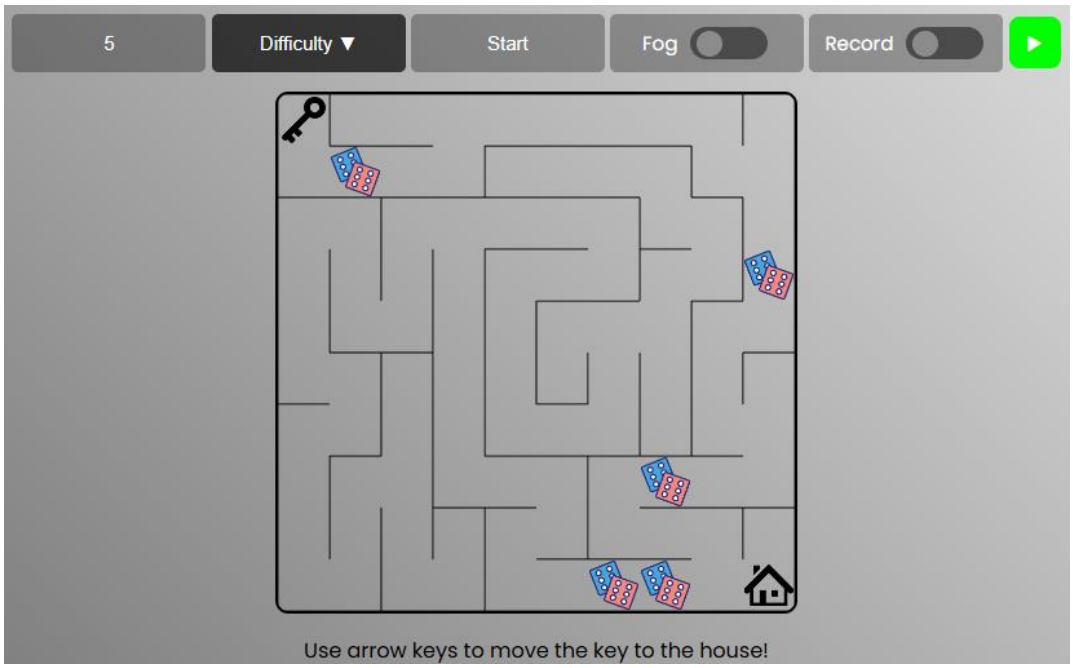

Figure 10. An example with 5 events and on the unfoggy mode

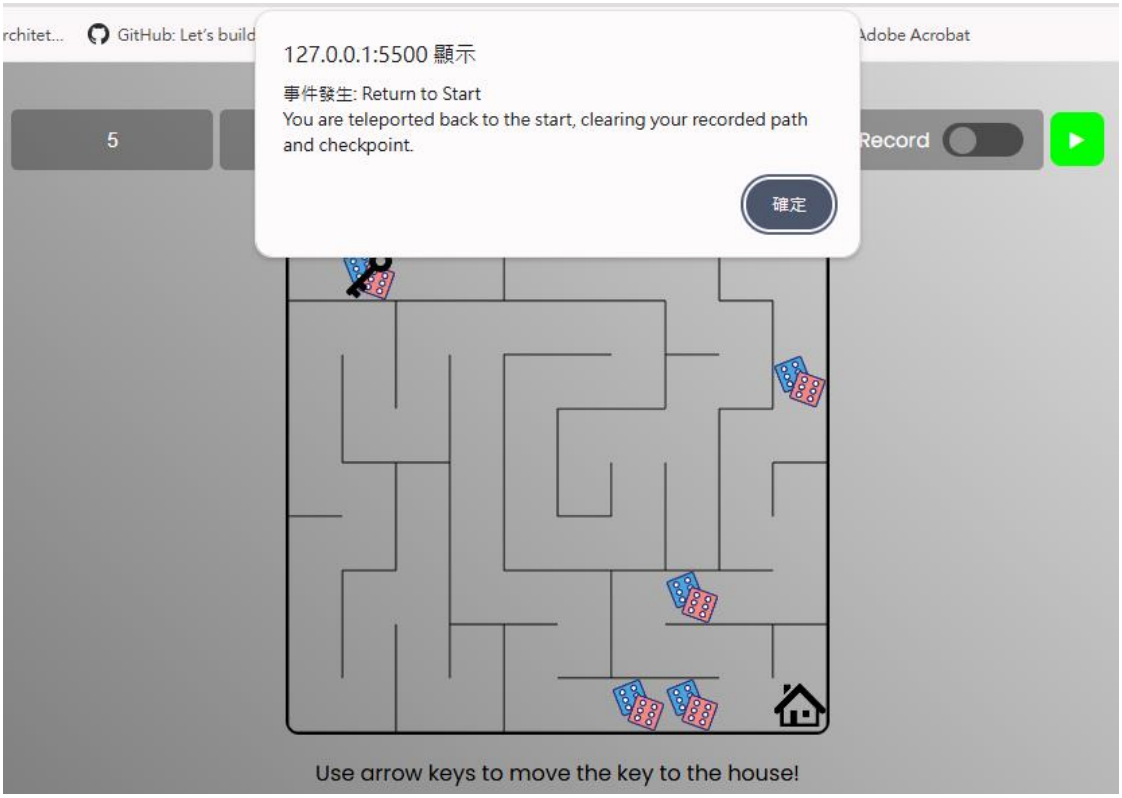

Figure 11. Example of an event triggered by a player

[2] On the foggy mode

When the foggy mode is turn on as illustrated in Figure 12, the maze would be covered by the fog, excepting the start point, destination, and the player vision as described on Section 2.1 Foggy mode above. Similar to the unfoggy mode, an event is triggered when a player stands on it. For vision enhancement and vision restriction events, the player's vision changes accordingly and reverts after a specified number of steps, as defined in the events.json file. For example, if the player steps onto a vision enhancement event, their vision expands to a 5*5 area for three steps. After taking three steps, their vision returns to a 3*3 area, if the player is not at a border position.

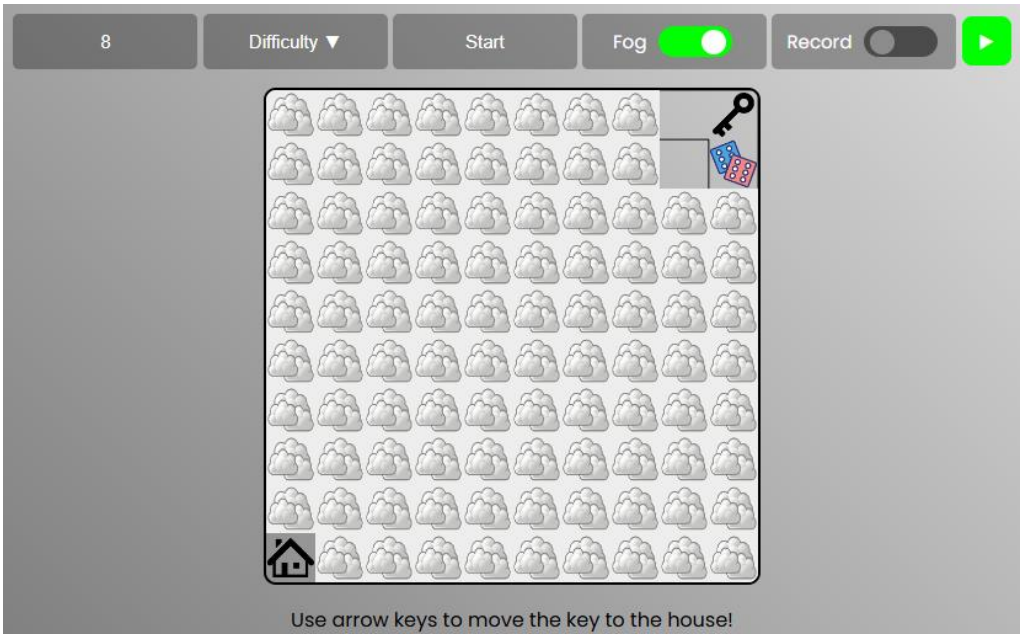

Figure 12. Event display on the foggy mode

[3] Recording mode and the replay button

When the recording mode is turn on, the moving path, player vision area, and foggy distribution are recorded. Once the replay button (shown as a green arrow button) is pressed, the records would be played and the player would not move until the replay process ends. The replay process must be correctly displayed on the maze. When the foggy mode is turned on, the fog should change according to the player's vision as well as the vision events (vision enhancement and restriction events), and the foggy distribution on the maze must be also recorded.

➢ Submission

1. How to submit your assignment

   The procedures for submitting your assignment can be found on our document website (http://wwwdmplus2025.csie.io:81/).

2. What should be submitted

   You should **submit your assignment to GitLab** and deploy your website on your server. You should also record a demo video showing each function in your assignment and upload it to YouTube.

➢ Grade policy

Graders will test your homework only on Google Chrome in 1920*1080. The homework submitted late will be accepted for up to 7 days after the due date and will receive an automatic 30% penalty. Homework submitted more than 7 days after the due date will not be accepted. Only one final submission (either one on-time or one late submission) is accepted. **Your assignment will not be graded without a demo video.** You should explain all the functions of your assignment in the demo video. **The link to your demo video should be submitted to eCourse.** The TA(s) will mark and give points according to

the following grading policy:

Layout	The interface of the maze game (Figure 1)		5%
Functions	Functionality and display	• The maze and item of functionalities are correctly displayed (10%) • Hover effect and transition effect (5%)	15%
		Difficulty settings and start button are correctly displayed and executed	10%
	Maze rules	Foggy mode • Cover the fog when turning on the foggy mode (5%) • Start point with the initial 2*2 vision (3%) • Start point with the preserved 1*1 vision area while a player moves out the start point (2%) • 1*1 vision area for the destination (3%) • Player vision is correctly displayed in the general case (3%) • Player vision is correctly displayed in the both enhanced vision and restricted vision (14%)	30%
		Recording mode • Correctly record the moving trajectory in the general case (5%) • Correctly record the moving trajectory on the foggy mode (5%) • Correctly record the moving trajectory and automatically adjust the vision size according to the vision effect events (10%)	20%
		Replay button • Correctly replay the moving trajectories on the foggy and unfoggy modes (10%) • Correctly replay the moving trajectory and automatically adjust the vision size according to the vision effect events (10%)	20%