Blind Badminton
－System Development to Recognize a Flying Object Without Vision－

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There are some sports for the visually impaired called blind sports. Blind sports have been very helpful in improving mental health and physical deficits for the visually impaired, as well as providing a better life. Many blind sports have changed in response to the characteristics of the visually impaired, and we have focused on ball games. The reason is that in ball games, we were interested in how they were recognizing and hitting a flying object. In ball sports among blind sports, throwing / hitting has been changed to rolling / attacking. Therefore, I created a system that can recognize an object flying with the visual function blocked, and evaluated it. Badminton was selected as a model sport for the experiment because the feature of this sport is that it does a rally without dropping the shuttle. Additionally, this sport has less risk of physical contact in individual sports. For these reasons, Badminton was adopted.

Preliminary experiments conducted during the experiment revealed that the height of the flying object, the distance from itself, and the timing to hit it were difficult. Therefore, we created a program that tracks in real time using motion capture and changes the pitch in accordance with the height of the shuttle using Unity, and a program that changes the volume according to the distance between the shuttle and the racket. Each sound comes from a speaker beside the court. A drone was used to control the speed and trajectory of the flying object. We experimented with five different patterns: an undeveloped shuttle, a shuttle with a single-tone device, a shuttle with a tracking marker, a shuttle with a tracking marker and a single tone, and a drone. As a result of the experiment, it was found that the orbit and the left and right of the shuttle with a device that produces a single sound were easy to recognize.

In addition, it was found that it was not possible to judge sounds instantly due to the high speed of the shuttle falling, and it was difficult to hear a specific sound when multiple sounds were mixed. From previous experiment, we turned out that the sound from the flying object can tell the trajectory and left and right. In the future, we will create a small device and attach it. Furthermore, by using a drone, it was possible to hit it compared to other patterns, we are planning to develop drones and devices that notify the player of the approaching state and the timing of hitting with vibrations and sounds composed of themselves.

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