



PWDAS-24

SIMPLE WIRELESS CONTROLLER USING A LASER POINTER

Jaemyoung Lee

Korea Polytechnic University, Korea

We propose a wireless receiver unit of photodetectors for a commercially available laser pointer. A laser pointer has been mostly used in presentations, and has extended its application areas due to its portability, low cost, and visibility of the laser beam spot. Lots of papers have used it as an input device, and some papers have modified the laser pointer to afford other functions as such the functions of a mouse. In this paper, we use a commercially available laser pointer as a wireless controller to activate and control a multimedia player. To use the laser pointer as a wireless controller, we build a wireless receiver unit of photodetectors arranged in a rectangular shape. A microprocessor in the receiver unit perceives the scanning direction of the laser pointer and determines a control mode in accordance with the proposed algorithm. Microprocessor's acting on the scanning direction can alleviate problems due to hand jitter, and laser pointer's misdirecting at a specific point. II. Laser pointer as a wireless controller

A microprocessor in the receiver unit monitors the resistance of each photodetector to determine the laser pointer's scanning direction over the photodetectors. The microprocessor activates an action on the multimedia player based on the scanning direction of the laser pointer over the photodetectors, such as leftward, rightward, upward, or downward. The proposed scheme could also activate certain action by tying each photodetector for an action

of the multimedia player. However, the tying of each photodetector for an action could cause unexpected actions due to laser pointer's misdirecting. Since it is hard to project a laser pointer's beam on a specific photodetector at a distance without hand jitter, tying an action with a scanning direction through a group of photodetectors is less vulnerable to misdirection and to hand jitter, compared with tying an action with on- or off- status of a photodetector. The proposed control algorithm of the proposed scheme will be shown in the conference. III. Experiment We investigated the feasibility of the proposed scheme by measuring the resistances of photodetectors being projected by a laser pointer. In experiment, we measured the resistances for each case and averaged the measured resistances. Measured resistances show monotonous increase as the laser pointer moves away from the photodetector. Because of the laser pointer's electrical jitter, we observed variations in resistances, which are shown as error bars. However, we could drive the multimedia player with the laser pointer at the distance of more than 20 m away from the receiver unit. IV. Conclusion In this paper, we propose a wireless receiver unit of photodetectors for a commercially available laser pointer. To use a laser pointer as a wireless controller without any alteration to itself, we build a receiver unit of photodetectors. Experiment shows that resistances of photodetectors monotonously increase as the laser pointer moves away. The microprocessor in the receiver unit acts on the scanning direction of a laser pointer in the proposed scheme. We believe that the proposed control algorithm can further afford other control modes and be applied to other systems.