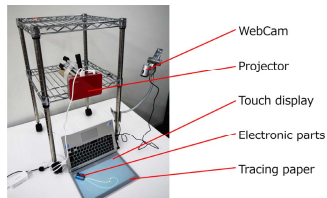


**Author Keywords**

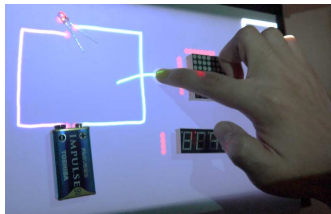
Projection mapping; Electronics; Pseudo-light emitting; Virtual wiring

**ACM Classification Keywords**

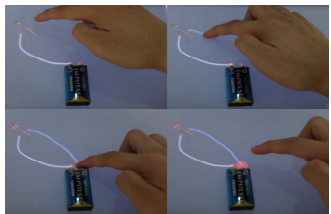
H.5.2. Information interfaces and presentation (e.g., HCI): User Interfaces.



System appearance



Wiring similar to circuit diagram



Virtual wiring and pseudo-light emitting

# Electronic Kit with No Current Flow that Uses Projection Mapping

**Yoh Akiyama**

Meiji University  
1-1-1, Higashimita  
Tama-ku, Tokyo, JAPAN 2140033  
gutugutu3030@gmail.com

**Homei Miyashita**

Meiji University  
4-21-1, Nakano  
Nakano-ku, Tokyo, JAPAN 1640001  
homei@homei.com

**Abstract**

With this system, you can make electronic circuits using trial and error and learn how each element works. You can connect or disconnect circuits by finger tracing. What is special with this system is that LEDs and matrix LEDs appear to emit light because light is projected to the parts by projection mapping. No current is flowing in the parts! In addition to making LEDs emit light, you can also set off a buzzer. Further, you can turn a switch on or off by covering it with your hand. To make this system easy for beginners, all wires have the appropriate resistors, and this is the default setting of the system. However, you can change this system in such a way that the elements in the system can be damaged by excessive voltage and current.

A tracing paper is placed on the touch panel display. A projector projects light onto the paper and a camera is used to detect motion. The tracing paper is used to balance the transmitted light from the touch panel and the projected light from the projector. By using the touch panel, you can drag wires to connect or disconnect them. The camera detects shielding of the switch, and AR markers are used for alignment of the optical system. The positions of the parts are not recognized by image recognition; rather, they are registered at the start of system.

Since no current is flowing, you can use damaged elements or unopened parts. We believe this system is superior to breadboards because accidents such as breakage of elements and poor connection can be avoided. We are sure you will have a better touch feeling in this system than in breadboards or circuit simulators. Other related studies include HMMBB, which automatically compensates open wires and performs projection mapping, and Visible Breadboard, which makes current visible.

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