



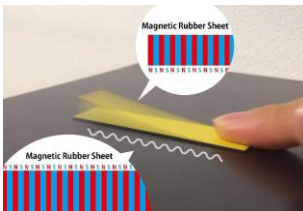
Abstract

In presenting haptic stimuli with devices such as vibrators and speakers attached to the hands and fingers, issues arise regarding the weight and size of the devices as well as wiring and power supplies for them. Meanwhile, in material-based haptic presentation, a power supply and wiring are not needed; however, it has not been possible to present various tactile stimuli with one structure. We developed a **magnetic tactile printing technology** that can **present various tactile stimuli with a very simple structure**. Only two magnetic sheets are used for this tactile presentation. When the sheets are rubbed together, though their surfaces are flat, a feeling of **a bumpy surface is presented between them**. Since the magnetic printed textures are retained for a long time, it is expected that magnetic haptic printing technology will expand the scope of applications of tactile experiences to toys, books, walls, and floors.

Haptic printing technology based on magnetic sheets!

Rewritable magnetic-field utilizing magnetic rubber sheets

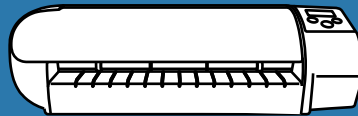
By rubbing these sheets together, it appears as if a real **bumpy texture** is generated **between the two sheets**.



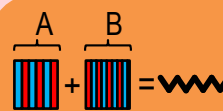
Expand tactile experiences to **toys, books, walls, and floors.**

Magnetic haptic printing technology

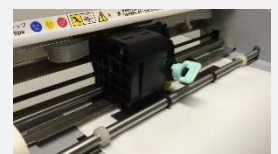
Magnetic Plotter



Magnetizing method



Haptic design method



Since things required for the magnetization are **common materials** and **general tools**, it is possible to provide a haptic experience **at low cost**.

A designing method for particular haptic surfaces

This technology enables us to **estimate** and **design** the **strength** and the **size** of the **bumpy texture** by the combinations of the **magnetic patterns**.

Haptic texture

- Haptic texture book
- Haptic interface
- etc...



References

- [1] K. Yasu. "Magnetic Plotter: A Macrotecture Design Method Using Magnetic Rubber Sheets," in *Proc. of the 2017 CHI Conference on Human Factors in Computing Systems (CHI '17)*, 2017.
- [2] K. Yasu. "Magnetic Plotter: A Macrotecture Design Method Using Magnetic Rubber Sheets," in *ACM SIGGRAPH 2017 Studio (SIGGRAPH '17)*, 2017.

Contact

Kentaoro Yasu Sensory Representation Research Group, Human Information Science Laboratory