Practice System for Controlling Cutting Pressure for Paper-cutting

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ABSTRACT

Our aim is to improve cutting skills for paper-cutting. Novices tend to cut paper with an unstable and higher pressure than necessary. Cutting paper with the appropriate pressure is an essential skill for artistic expression. We have developed a device to support cutting practice with a stylus and a drawing display and measured the difference between cutting pressures of novices and experts. Moreover developed a practice system for controlling appropriate pressure based on the pressure used by experts. We confirmed that novices practiced with the system, and their range of pressure used, and variation in pressure improved more than with the existing practice method.

MEASUREMENT SYSTEM

Device measures the cutting pressure.

- User cuts paper on drawing display with device.
- Our knife has a blade on the tip of the stylus.

EXPERIMENT 1

Purpose: Evaluate in cutting pressure between novices and experts.

- Novices cut with stronger pressure than experts.

SUPPORTING SYSTEM

Display shows the color and alert according to the pressure.

- Pressure of experts is 250 to 350 g.
- User controls pressure by function.

EXPERIMENT 2

Purpose: Evaluate of pressure control by our system.

- 3 groups perform the 3 steps.
 - 3 groups practice with various method in Step 2.
- Step 1: They cut the picture.
Step 2: Practice with various methods.
Step 3: They perform same as step 1.
- Gr 1: With our system.
Gr 2: Without the system.
Gr 3: Trace with a pencil. *
- * One of the previous method.

Target in Step 1 and 3.

Practice in Step 2.

Compare cutting pressure variations.

Plot cutting pressure with wavy line.

MOTIVATION and AIM

Our goal is to improve the cutting skill.

Novices can control cutting pressure.

- Gr 1 cut with a lower range.

- Gr 1 maintained a pressure.