

## **I/O Brush**

### **Idea:**

I/O brush was designed as a drawing tool which was specifically targeted to the young children to examine textures, colors and movements found in day to day materials by simply picking up and drawing with them or use it to paint.

For example, if we take the brush and point it at say, an orange and when we paint with that brush, our brush stroke would be the orange texture. Movements play an important role in I/O Brush. For example, just point the brush few seconds at a person's eye which blinks and when we try to paint, it looks like a movie clip as if we are moving the brush around.

I/O Brush looks like a regular simple physical paintbrush that has a small video camera having touch sensors and lights inserted inside. On the outside of the drawing canvas, I/O Brush can pick up the texture, color and movement of a brushed surface [1]. Children can illustrate or sketch with the unique ink they picked up from their environment on the canvas. So, due to this, not only they know about complex works of design and art, but also they come to know about the features and patterns available in their environment.

Hence the main idea behind I/O Brush is based on 2 main functions: Picking up the traits or features from the real world and just painting with that features.

### **Technology (How it works?):**

I/O Brush system consists of 2 components: the drawing canvas and the brush. Brush contains a small CCD video camera in its tip with the supplement light bulbs around it as shown in the Fig [1]. Touch sensors that are spring based resembling the characteristic of the brush tips are also inserted inside the brush. So when the brush comes in contact with the surface, the lights surrounding the camera turns on to supply supplemental light for the camera. On that duration of time, the system snatches the frames from the camera and accumulates them in the program. Apart from that, there are 150 optical fibres [1] woven into the brush tip.

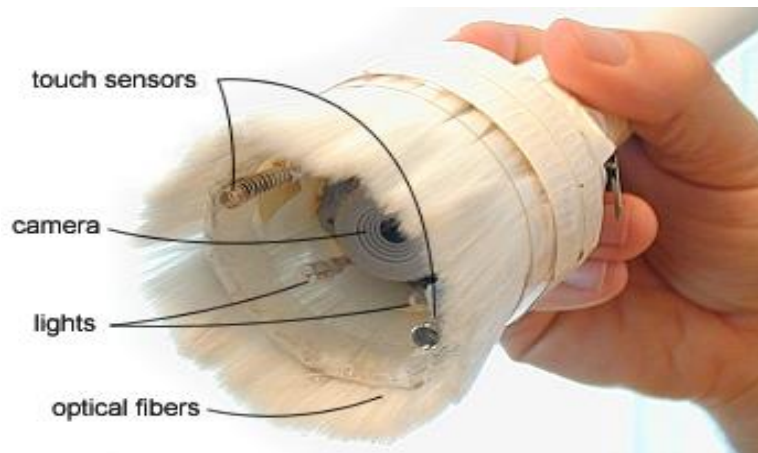


Fig [1]

I/O Brush has 3 modes for picking up the ink: Color, Texture and Movement. The Color mode calculates the RGB values of all the pixels in an encapsulated frame and returns the common RGB value due to which the child can sketch with a solid color. The Texture mode takes a snapshot of brushed surface that consists of one frame. The Movement mode snatches up to 30 successive frames [1] of brushed surface due to which the child can draw with the movement. So when the child moves the brush on the entire canvas, successive frames drops off and finally it shows a captured 30 frame animation in a loop.

### Suggestions:

- I/O Brush should be made **wireless** but still children need a huge drawing surface to sketch or draw.
- **Runnable** on a tablet PC.
- Providing **large canvas** and a **physical palette** (such as Personal Digital Assistant) that works with this wireless I/O Brush.
- To have different types of I/O Brushes such as **Color Brush**, **Pattern Brush** etc. having different characteristics.

### Reference:

[1] Kimiko Ryokai, Stefan Marti and Hiroshi Ishii, I/O Brush: Drawing with Eveyday objects as Ink