From Computational Thinking to Computational Making

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Abstract

This demo focuses supplements our paper "From Computational Thinking to Computation Making" to allow visitors to interact with the various technologies the children in our club created, including an interactive monster. Additionally, to make the demo interactive and to encourage conference attendees to discuss their experience of "making" we will have a Monster Making contest.

Author Keywords

Ubicomp; making; children; programming; education

ACM Classification Keywords

K.3.2. Computing Millux; Computers and Education

Children's Projects

We will display two types of the children's projects:

Bunny Bright
For this activity, a Bunny Bright electronics kit was used, that is designed to teach basic electrical knowledge to children from the age of 5 and up [1]. Instructed by the tutors in the computer club, the children soldered the LED, a reed switch, a resistor and a battery holder onto a circuit board. The switch on the completed board could then be activated by a magnet and the LED would lights up. The completed circuit board was then placed into a stuffed, sewn animal. For

Figure 1: Figure projects included a swan on a lake, a dragonfly and a monkey with a banana.

Figure 3. Some of the children's monsters.

our example project this was a stuffed rabbit containing the board with a carrot housing the magnet (see Figure 1). When the carrot was touched to the rabbit's mouth, its belly lit up to show it was happy. Some children elected to create alternate forms.
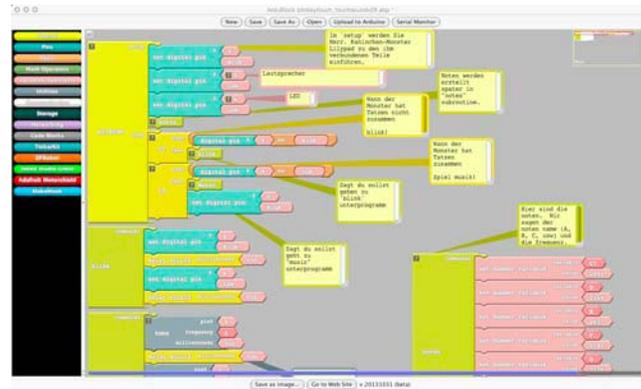

Figure 2. Ardublock programming language.

Monster Making
The activity was based on one of the chapters in Buechley, et al. [2] "Sew Electric", though we did the project using Ardublock. Ardublock is a drag and drop add-on to the Arduino IDE, similar in its appearance to MIT's visual programming environment Scratch [3] (see Figure 2). Children made a stuffed monster from pieces of felt (see Figure 3), connected electronics and then learned how to program it to be interactive. Each project contained a LilyPad Arduino microprocessor, a speaker, and an LED all connected by conductive thread. When the monster's paws were held together it played music. When the paws were not touching one another the LED just blinked. The paws were made of conductive fabric so touching them together completed the circuit.

Monster Making Contest
In our paper we discuss computational making being a broader concept than computational thinking. In our paper we emphasize that in addition to computational thinking skills, computational making requires aesthetics; creativity; constructing; visualizing multiple representations and understanding materials. We hope by doing the monster making project, Ubicomp attendees will have a chance to experience and discuss computational making. Participants will have to purchase their Aurdinio Lilypad and speaker, but we will provide all supplies. To make things a little more fun we will offer prizes for the best monster.

Acknowledgements

References
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