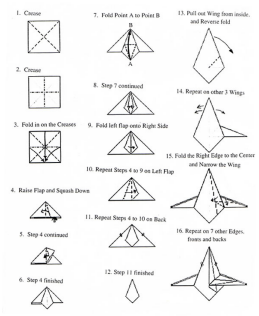
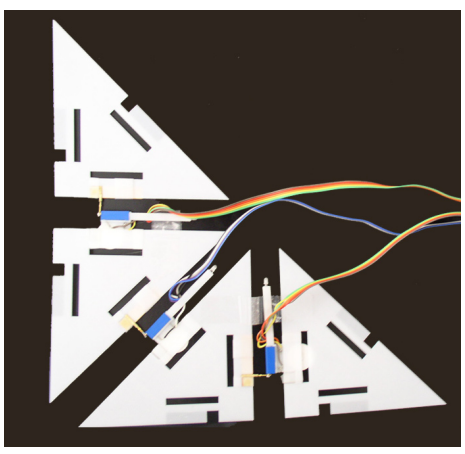
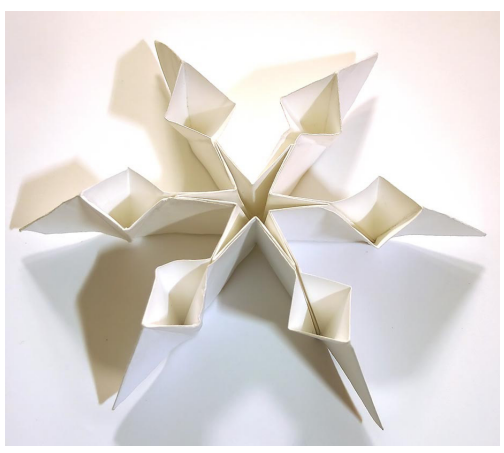


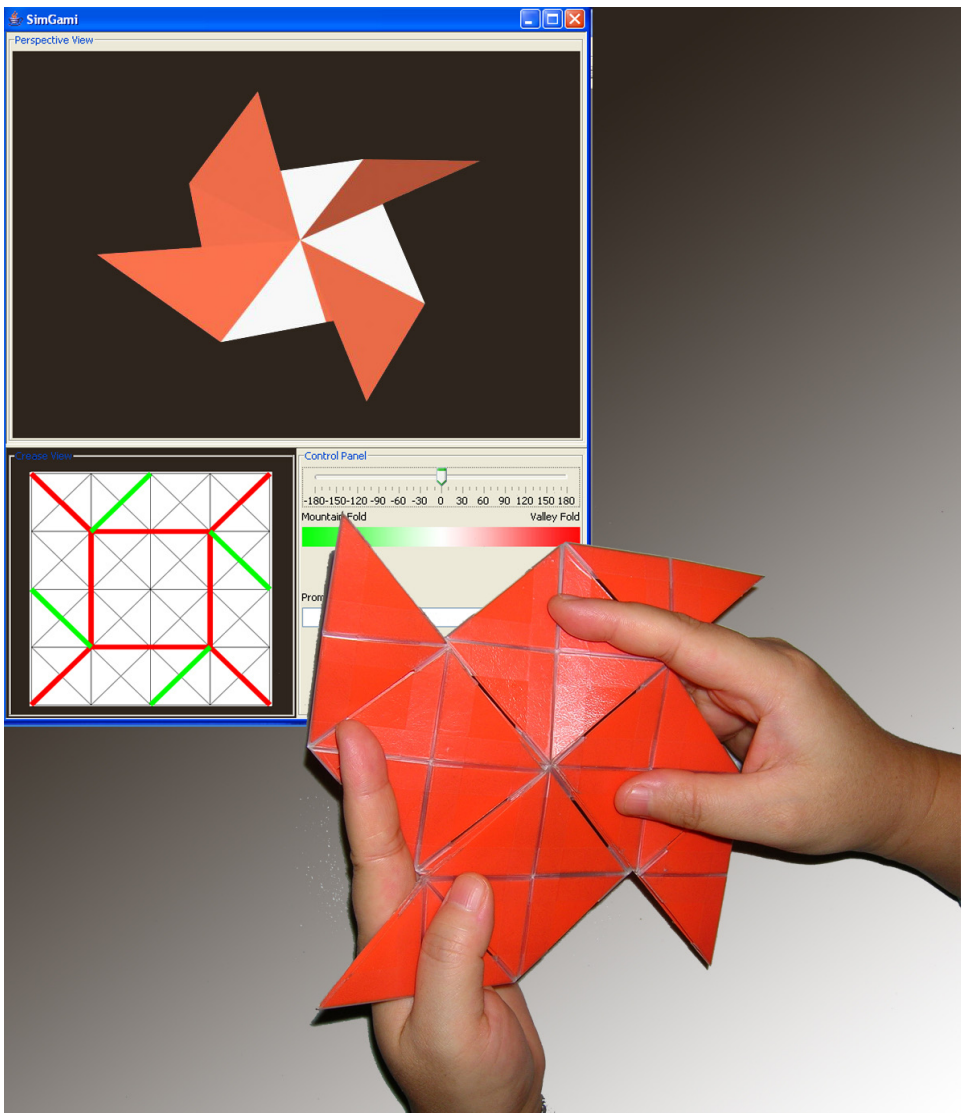
Easigami

Interactive Tangible and Digital Folding

Yingdan Huang







Playing with origami, children learn geometry and spatial reasoning skills. However children often find it difficult to interpret diagrams in a book into origami action. The traditional way of teaching origami discourages children from creating original paper models. It cannot reveal the rich content in the transformation between a 3D model and its 2D crease pattern. Easigami is a Tangible User Interface (TUI) that addresses these issues. It uses computer interaction to clarify origami actions and to encourage origami exploration through 2D-3D transformation. In this way Easigami can strengthen spatial reasoning abilities.

The physical interface of Easigami is a paper-like triangle tile toy composed of flat triangle pieces and electrically enhanced hinges. The hinges join plastic triangles to form a flat sheet with a crease pattern. Each hinge can provide folding instructions by illuminating LEDs to indicate which crease(s) are active as well as the direction to fold. Each hinge senses the relationship between the two adjacent triangles it connects, and sends the angular information to a desktop computer. Users can follow the instructional signals and use two hands to fold the Easigami interface along pre-folded creases. A real-time computer graphic model of the physical triangles is displayed on screen along with the corresponding 2D crease pattern.

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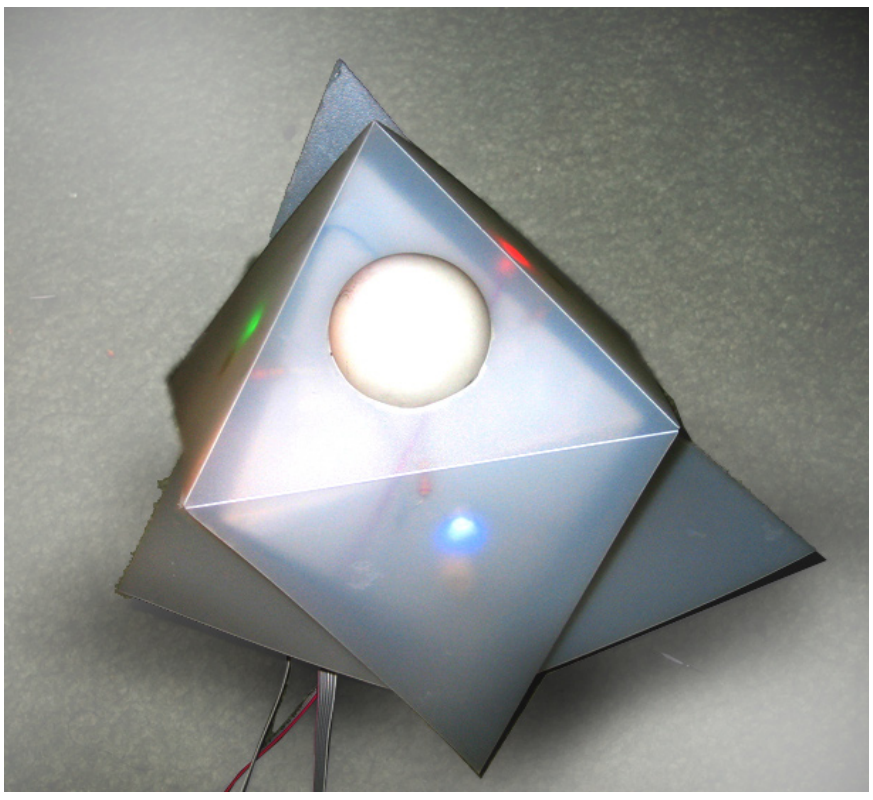
Color Mixer

Interactive play of color through lights

Tajin Nahar Ali Biswas



The Color Mixer is a toy for small groups of children to explore the nature of light colors as opposed to pigment mixing. Children interact with the Color Mixer by adding light to the red, green and blue faces to see the sum of the colors.

The Color Mixer demonstrates an interactive play of color through lights. Through painting a child is introduced to the amazing characteristics of mixing colors. This activity stimulates creativity and also opens up underlying principles of how colors mix than in paint and paper. Colors mix differently in light. To understand this phenomenon this toy provides a hands-on way to input the three primary colors of light in varying quantities and see the resulting color.

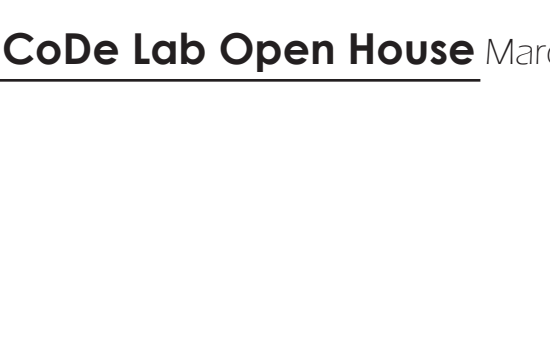
Designosaur

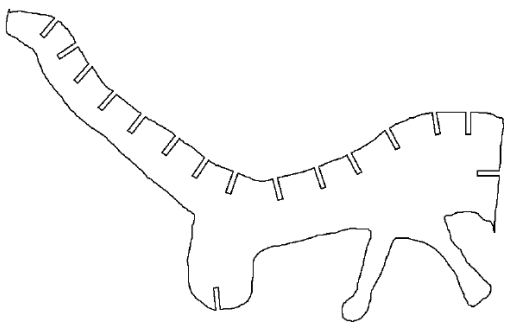
Sketch-to-fab software for novice designers

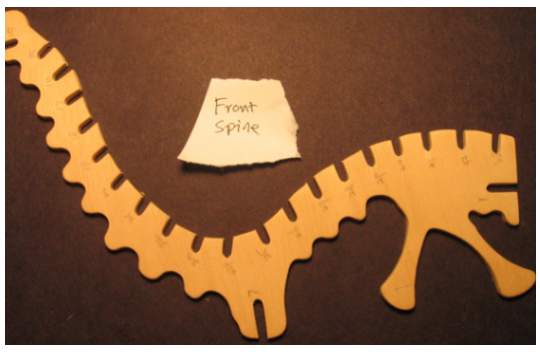
Gabe Johnson

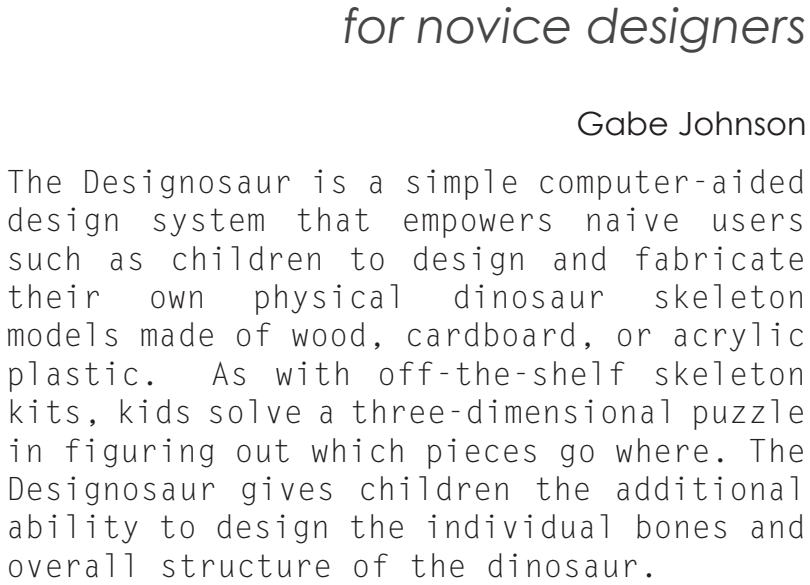
The Designosaur is a simple computer-aided design system that empowers naive users such as children to design and fabricate their own physical dinosaur skeleton models made of wood, cardboard, or acrylic plastic. As with off-the-shelf skeleton kits, kids solve a three-dimensional puzzle in figuring out which pieces go where. The Designosaur gives children the additional ability to design the individual bones and overall structure of the dinosaur.

Typical general purpose design software encumbers users with a steep learning curve, often forcing people to become technical experts in the software before gaining the ability to produce good designs. The Designosaur offers an example of a CAD system that does not impose such a cost on its users.









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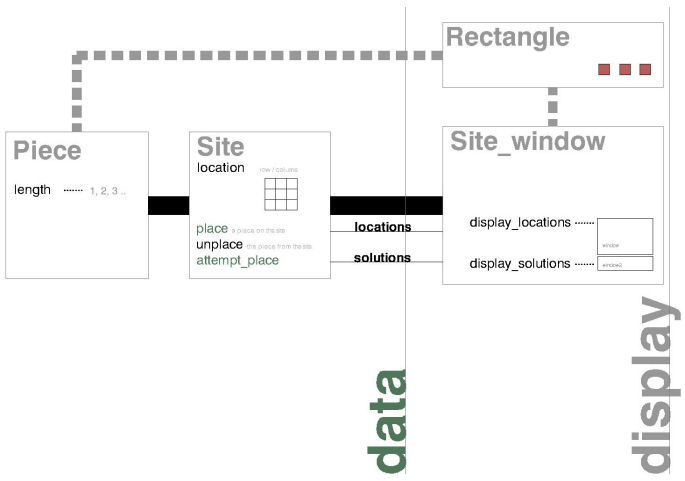
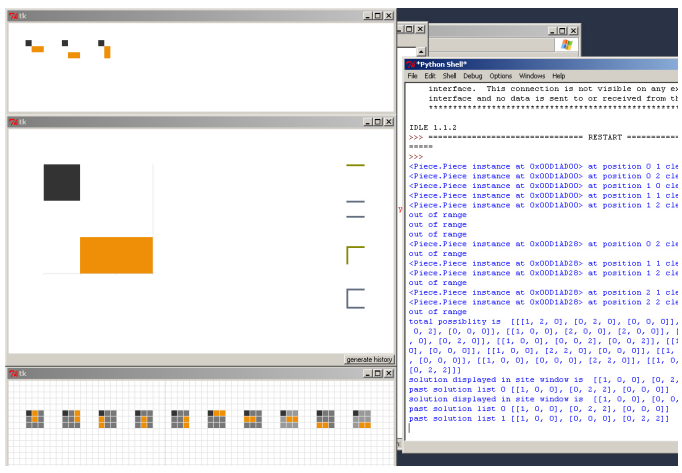
Possibilities & Options

Design Game for Programmatic Arrangement

Sora Key





The Possibilities and Options is a design game that enables programmatic arrangement for students and novice architects during early design, by providing possible positions of given pieces. The program receives position information by placing a piece, displays it on a grid, and suggests possibilities for positioning the next piece. It provides simple 2D grids and records the history of changes for the next design phase.

Architectural Design Process / Design Game:
When an architect gets a new project with a program from a client, the architect wants to experiment with the arrangement of the building program on the given site.First the architect inputs the site dimensions, then the sizes of the functional programs. The architect should be able to specify the location of the most critical element or elements, by understanding existing conditions and narrow the problems and constraints by selecting a few possible design alternatives for later use,

The system will respond by showing all the possible arrangement of remaining programmatic elements,one by one. After the architect specifies the first element, the system generates all possible positions for the second piece. The architect will play with positions to see what is appropriate. During the play the system will record the history of changes so the information can be retrieved when needed later.

Every game has its own rules as well as a design process so to address that rule finding compositional play stays within the core of intellectual challenge.This program tries to deal with the idea of communication by representing information input, both from the user and the computer. To the user, the graphic representation is the way to communicate position information so the communication is expressed directly graphically on the grid. By providing options, the software environment becomes more interactive, and the process of playing with the program evolves to a more responsive way of dealing with design problems.

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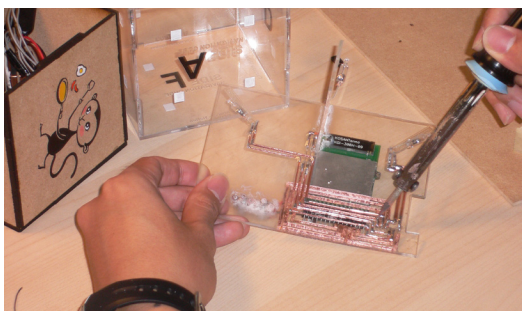
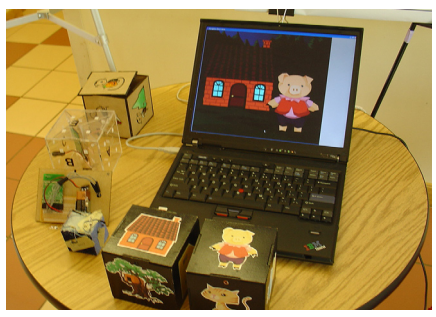
Storytelling Cube

A tangible interface for playing a story

Tony Sheng-Kai Tang





Children love stories. They are curious. They often ask “What if?” What if the three little pigs were three little monkeys? What if the brick house were a candy house? However, most storybooks only provide static content. With Storytelling Cubes children can manipulate digital content to construct and animate stories.

In the current version, we decompose the story of Three Little Pigs into two layers,one for character, the other for background. Each cube controls a layer providing six options. Manipulating the two cubes generates thirty-six different story scenes. Children can tell a story based on one scene, then switch to another story by changing the scene.

An orientation sensor mounted inside the cube consists of three mercury switches arranged in specific angles in order to generate specific on-off sequences for six faces. When a chosen face is up, a transmitter inside the cube ssignals the computer to display related digital content.

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