

Designers sketch to visualize and think about three-dimensional form. Rapid prototyping machines (laser cutters and 3D printers) enable designers to build physical models of 3D designs. Three-dimensional model making and design engages children, presenting them with various kinds of learning opportunities.

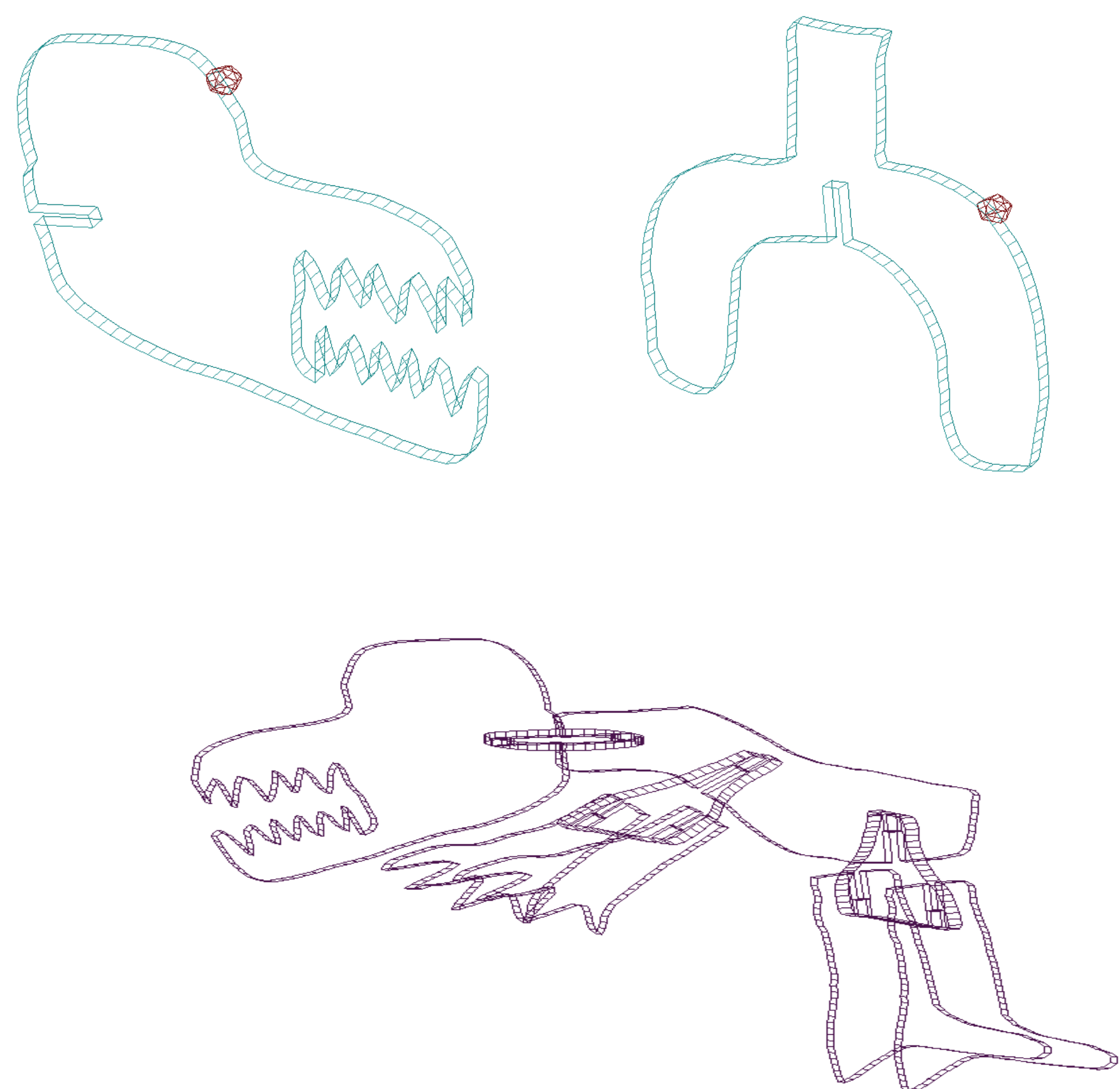
Domain-oriented sketch-to-fabrication software makes it easy for designers to quickly make 3-D models by sketching. Furniture Factory enables designers to model tables, chairs, sofas, and bookshelves by sketching axonometric drawings. The program helps them select and detail appropriate joints between the furniture parts, and outputs a file ready for the laser cutter. The Designosaur program enables a designer to make physical skeleton models of dinosaurs by sketching and assembling 2-D bone models.

## Sketch-to-fabrication: Furniture Factory and Designosaur

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### Designosaur Gabe Johnson

The Designosaur is a simple computer-aided design system that empowers naïve users such as children to design and fabricate their own physical dinosaur skeleton models made out 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. We aim to show kids that we do not live in a "paint-by-number-world"; instead of only following the instructions on the back of the box, children can invent their own creatures and play with different design options.



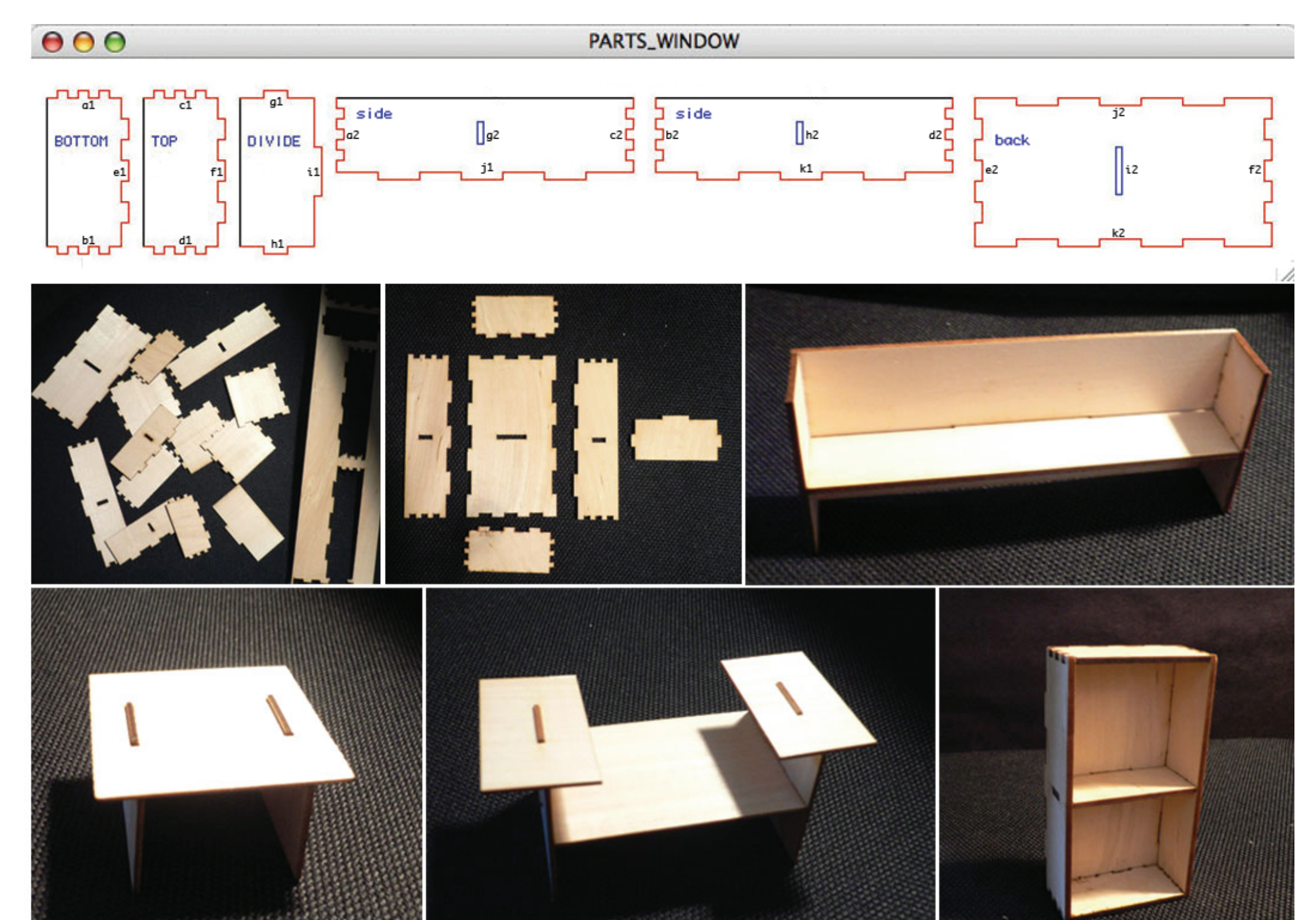
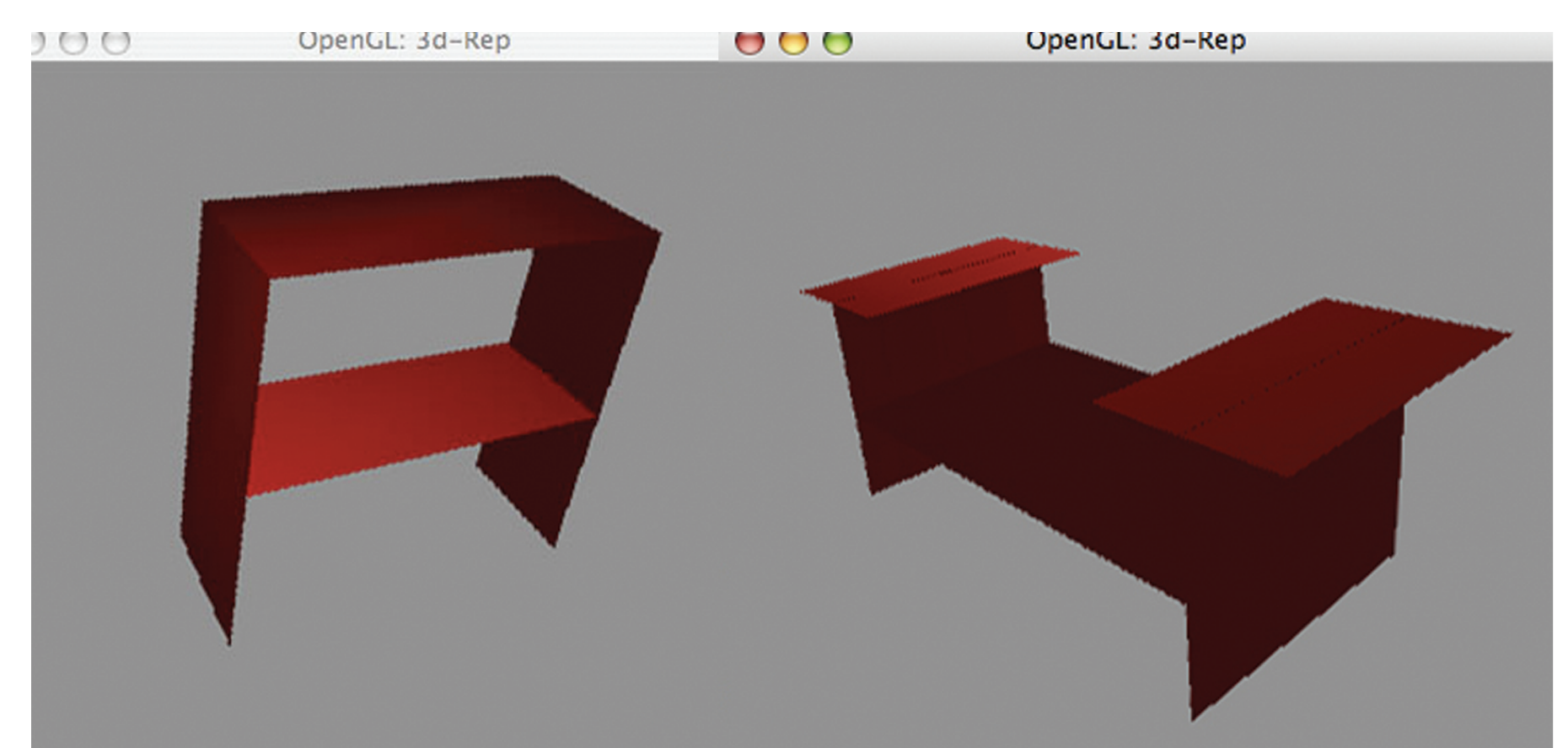
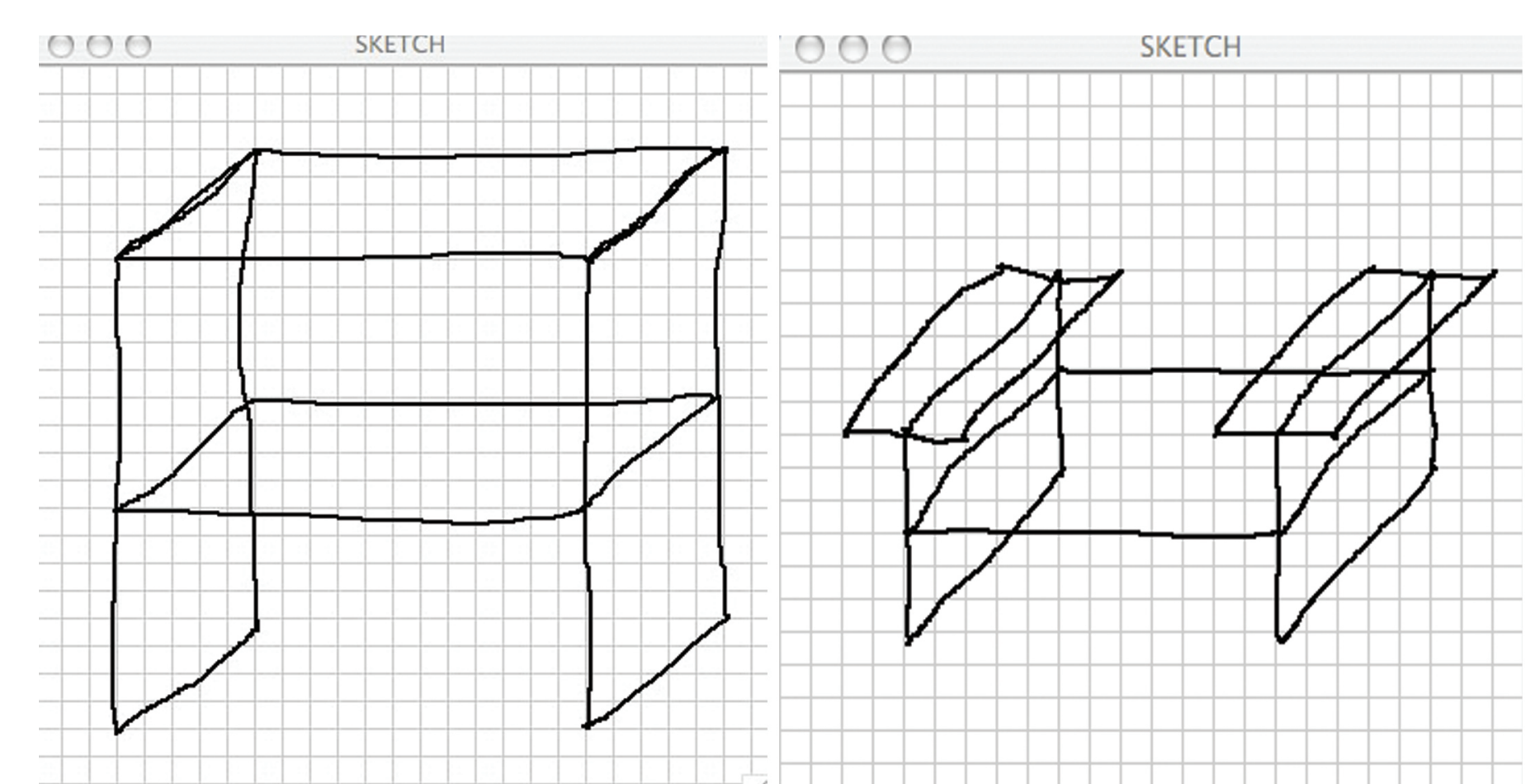
Sketching

3D  
Representation

Cut-outs  
&  
Assembly

### Furniture Factory Yeonjoo Oh

The Furniture Factory is a computationally enhanced craft program to help novice designers construct physical models using rapid prototyping and manufacturing machines. A designer can use its sketch design interface to draw furniture in 3-D. The design is displayed in an isometric viewing window where the designer can edit it. The program decomposes the 3-D model into flat panels and displays them in the parts window adding joints to panels according to connection conditions. These added joints enable designers to construct the physical model easily and quickly. The program generates HPGL code to cut the furniture parts on a laser cutter. Designers construct their model furniture by assembling the cut parts.



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