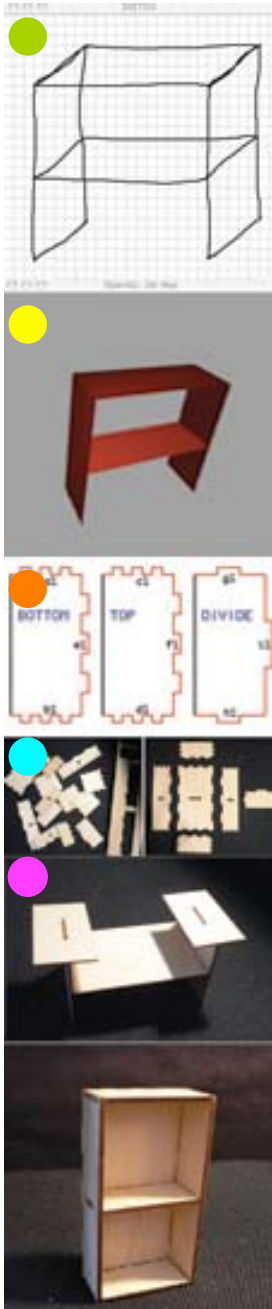


Furniture Factory

Yeonjoo Oh, Mark D Gross, Ellen Yi-Luen Do
Computational Design Lab, School of Architecture



Learning design through making things

Architect Frank Lloyd Wright reportedly traced his design skills back to early childhood experiences with the building blocks (known as "gifts") associated with 19th century German educator Friedrich Froebel. Today, computer-controlled rapid prototyping hardware enables a new order of personal fabrication. We are building computationally enhanced construction kits and craft activities to serve as vehicles for learning to design.

Furniture Factory: From Sketch to Fabrication

The Furniture Factory is a "computationally enhanced craft" program to help novice designers construct physical models using rapid prototyping and manufacturing machines. Furniture Factory provides a sketching interface and intelligent design support.

- A designer uses a sketching interface to draw furniture in 3-D.
- The designer views and edits it in an isometric viewing window.
- The program decomposes the 3-D model into flat panels and displays them in the parts window. It adds joints to panels according to connection conditions.
- These joints enable designers to construct a physical model easily and quickly.
- The program generates HPGL code to cut the parts on a laser cutter and designers construct their model furniture by assembling the cut parts.

Program Components

Sketch Interface: a designer sketches an isometric view of a furniture piece.

Geometry Analyzer analyzes the sketch and computes faces, edges and 3-D coordinates and analyzes connection conditions.

3-D Representation creates and displays a 3-D model using this information.

Joint Creator adds needed joints according to identified connection conditions.

To learn more:

<http://code.arc.cmu.edu/lab/html/project110.html>

This work is supported in part by the Pennsylvania Infrastructure Technology Alliance (PITA), a partnership of Carnegie Mellon, Lehigh University, and the Commonwealth of Pennsylvania's Department of Community and Economic Development (DECD). This research was supported in part by the National Science Foundation under Grant ITR-0326054. The views and findings contained in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.

