
Demonstrating Kyub: A 3D Editor for Modeling Sturdy Laser-Cut Objects

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ABSTRACT

We present an interactive editing system for laser cutting called *kyub*. *Kyub* allows users to create models efficiently in 3D, which it then unfolds into the 2D plates laser cutters expect. Unlike earlier systems, such as *FlatFitFab*, *kyub* affords construction based on closed box structures, which allows users to turn very *thin* material, such as 4mm plywood, into objects capable of withstanding large forces, such as chairs users can actually sit on. To afford such sturdy construction, every *kyub* project begins with a simple finger-joint “boxel”—a structure we found to be capable of withstanding over 500kg of load. Users then extend their model by attaching additional boxels. Boxels merge automatically, resulting in larger, yet equally strong structures. While the concept of stacking boxels allows *kyub* to offer the strong affordance and ease of use of a voxel-based editor, boxels are not confined to a grid and readily combine with *kyub*’s various geometry deformation tools. In our technical evaluation, objects built with *kyub* withstood hundreds of kilograms of loads. We demonstrate the *kyub* software to the CHI audience and allow them to experience the resulting models first hand.



Figure 1: A selection of objects created using *kyub*, a software system that allows users to design 3D objects for laser cutting. By affording closed box structures, objects made using *kyub* are very strong. This allows users to make tables, shelves, and chairs that can hold a person. (All shown objects are assembled from 4mm plywood sheets—pressure fit, not glued).

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