Evolving AdaCAD: A Generative Design Tool for Making Woven Drafts

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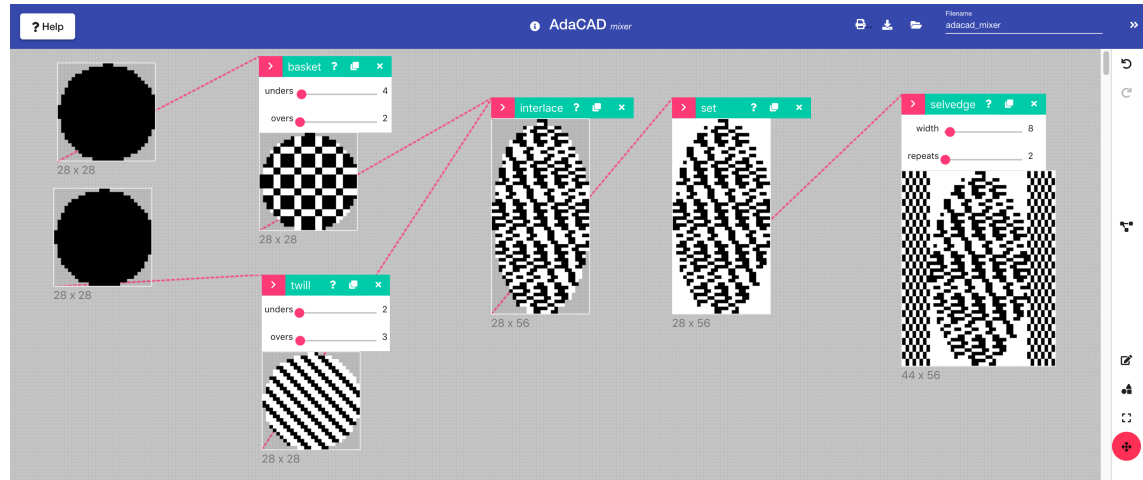
Fig. 1. Screenshot of the AdaCAD Interface

We first introduced AdaCAD in 2019 as a tool for designing circuitry in tandem with woven drafts (e.g. patterns for generating woven textiles) for smart textiles applications [8]. Since its introduction three years ago, we have continued to expand the tool in collaboration with both hand and jacquard style weavers which revealed several limitations in our original design. Specifically, we modeled the design after commonly used tools like Photoshop, imagining that someone would define their canvas in a top-down fashion and then draw their design atop the canvas [10]. This is the traditional workflow for current weaving tools like WeavePoint [5], ArahWeave [1], JacqCAD [2] and iWeaveIt [4]. Weavers evaluating AdaCAD, thus, did not see a distinct advantage over their existing tools, of which they were already deeply familiar. This insight, combined with the discovery of another software called ProWeave [3], which is no longer supported, allowed us to re-conceptualize our software as a more playful, "bottom-up," design tool more resonant with other experimental projects within and outside HCI [6, 7, 9]. Specifically, it allowed us to imagine the weaving drafts (with or without circuitry) as a form that grows from operations performed on sub-components, a typical pattern in generative design.

We believe this offers advantages for evolving the tool. First, the tool's design patterns encode the procedures in which woven structures are produced, helping more novice weavers better understand the relationships between a woven draft, weaving materials, and the eventual textile form produced. Second, it offers a broader community of developers to create their own components (without side-effects in the code base). Our goal for demonstrating the tool at SCF is to increase awareness of this project, invite engagement in its development, and share our broader discoveries of designing tools that cross the intersection of textiles and code.

CCS Concepts: • **Applied computing** → *Arts and humanities*; • **Human-centered computing** → **Interactive systems and tools**.

Additional Key Words and Phrases: Generative Design, Weaving, Smart Textiles

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