

Student Name(s): Kafka Wei, Taylor Scott

Student Peer Advisor: Alex Hsia

Research Mentor Name: Ron Eglash

Research Mentor Department: Stamps School of Art and Design, School of Information

Culturally-Situated Design Tools: Laser-Cutting Adinkra as an Artisanal Cyborg Strategy

Many researchers are concerned that AI, robotics and other advances will displace workers and exacerbate wealth inequality. One alternative is that of "artisanal cyborgs," which combine Indigenous or traditional knowledge with high tech innovation. Adinkra are a beautiful and meaningful symbolic repertoire common in Ghanaian art, and Ghanaian artisans often incorporate adinkra into their craft. These same artisans must also compete with mass manufacturing and an influx of factory-fakes. Our research examines how to design human-machine collaboration that preserves the creative and hands-on aspects artisans love, while enhancing artisanal skill sets, workflow and quality of production.

We use methods of ethnomathematics and ethnocomputing to find mathematical principles in adinkra, which we then develop as part of the Culturally Situated Design Tools suite (<http://cstd.org>). This creates user-friendly block-based coding that artisans with little formal education can use to enhance their skill set. In dialog with artisans and the student-run Creativity Group in the city of Kumasi, Ghana we are creating a process for laser-cutting the image generated by our CSDT software that is appropriate to their context. The concerns include HCI issues, product quality, security for equipment, training, marketing, and most importantly the preservation of "unalienated labor".

We expect to find that our CSDT software and laser-cutting procedure will help artisans be more competitive in the market by allowing them to create more complex adinkra, reduce waste, and enhance their skills and workflow. At the same time, we expect that the open-ended nature of our CSDT software will still give artisans creative license and that artisans will find it easy to use.