Tailored Controls: Creating Personalized Tangible User Interfaces from Paper. Becker, et al. ISS. 2019.

What are the core research questions addressed by the work?

- How do we enable users to create their own, personalized, user interfaces by cutting out arbitrary paper snippets and assembling them in a suitable surface?
    - What types of interactions does such a system have to enable?

What motivates the work?

- User interfaces rarely adapt to specific user preferences or the task at hand
- GUIs do not produce any haptic sensation, which humans innately prefer over passive interfaces
- GUIs do not provide common physical interactions humans are used to, such as easily adding, moving, or removing elements
- TUIs cannot adapt to a specific user not to the task the user intends to carry out, simply because they are hardware devices and thus are constrained by their physical form
- Enabling users to craft their own TUIs is a potential approach to supporting the benefits of TUIs and enabling greater customizability

How does the work understand the usage, capabilities, and limitations of paper?

- Paper is readily available, inexpensive, customizable, tangible, frequently used for early prototype visualization, easily reconfigured, passive, infrastructure-free, adaptive, tactical, low-clutter & portable

What is the target application domain of the work?

- Not targeted application domain, left intentionally general: “TUIs … made from plain paper … can be connected to virtually any application”

What are some proposed extensions to paper proposed by the work?

- Use of arbitrary paper snippets as an control interface for virtual applications

What design constraints or objectives guided the work’s implementation of the proposed extensions?

- Derived a taxonomy of interactions that needed to be supported

How are the proposed extensions implemented?

- Use of an RGBD camera for finger and and paper interface tracking

What findings have been obtained from either the implementation process or an evaluation of the proposed system?

- Technical limitations of RGBD camera use: Currently no multi-touch support, difficult to track fast movements of the finger tip, the interaction space is currently limited to a relatively small flat area