CAD Buddy

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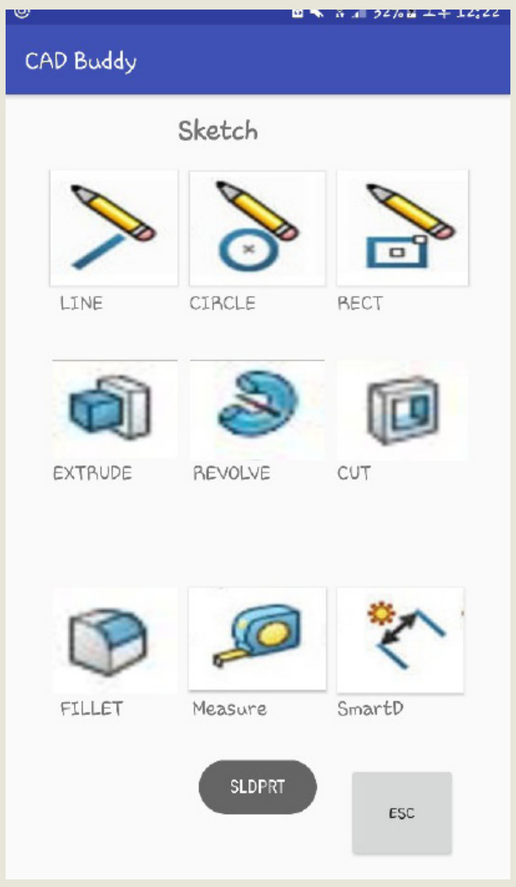
Olin Colleg of Enginnering | Spring 2018 | Software Design

Abstract

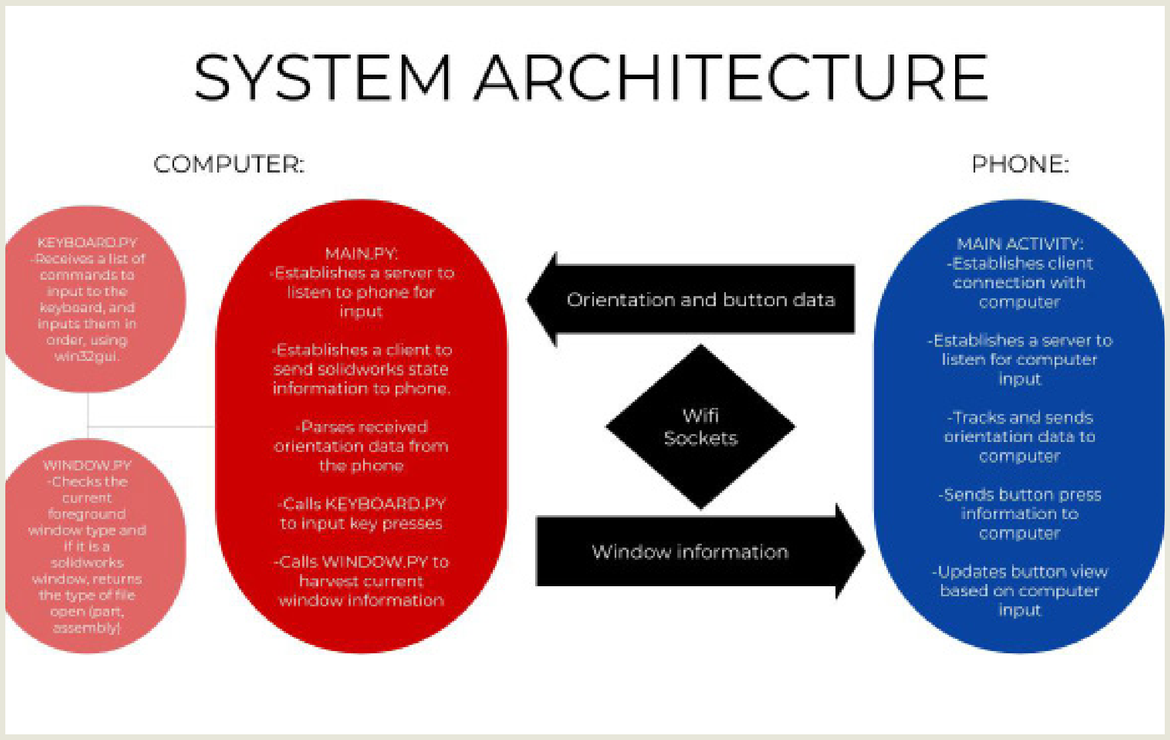
Anything that needs to be physically produced is first designed in CAD. Although it is an important tool, it can be quite daunting for beginners and tedious for intermediate users. With this project, we hope to make CAD more approachable for beginners, and streamline the process of intermediate users. This project explores the use of a smart phone as an advanced form of input for laptop computers. Rather than using a mouse with relatively few sensors, buttons, and methods for feedback, we decided to try to leverage the many sensors and features of smartphones in order to create a cheap and effective tool for interacting with computers.

Background



When CADing, the user will use a regular mouse in their dominant hand, just like normal. However, rather than jumping around the keyboard, the their left hand will be resting on a mobile device running CAD Buddy. Because only the most relevant shortcuts are shown, the left hand will not need to move nearly as much. In addition, the user will be able to roughly change the orientation of the part in solidworks by tilting the phone if the mouse is being used for other activities (ex: interacting with the feature tree).

Implementation



Above is a system architecture diagram that describes the main classes/modules of the project, as well as how data flows in the program. It uses two way socket communication over a local wifi network to allow the platform to be more dynamic. To interface with solidworks, the main script emulates keyboard presses.

Narrative

Our project has evolved a lot over time. Factors including our own programming knowledge as well as design feedback from others have shaped this project and where we were able to take it. A lot of the work was spent trying to learn and try new, complex things. While our current code is not expansive, it is a direct result of our extensive independent research, which is not at first obvious.

1. Our initial project was some kind of Augmented Reality/advanced electronic drawing program. We hoped to draw in 2D or 3D using a phone as an input device. However, we discovered that at least at Olin, a program that interfaces with CAD would be more useful.

2. We initially planned to use bluetooth to communicate between the computer and the phone, but that proved too difficult for us to learn. We decided to utilize server sockets to stream sensor data over wifi to a computer, where our python script would interface with solidworks.