DHRUV GARG 16 BCE 1190

# HUMAN COMPUTER INTERACTION

## DIGITAL ASSIGNMENT 3

Sprout Pro by HP is a technology that empowers you to manipulate the physical and digital worlds in innovative ways with immersive technology that's built with a PC, hi-res cameras, Touch Mat and 2D and 3D scanning capabilities.

**AIM:**

1. To Describe and Design an innovative app for the HP Sprout pro desktop PC.
2. Explain the development method used in detail.

**APPLICATION BUILT: Prototype builder for engineers and architect developers**

HP Sprout Pro is an immersive technology that can help engineers build models in a collaborative manner. It can help visualize the prototype **computer architecture/processor models** (computer science), **circuit models** (electrical engineers), **automobile designs** (mechanical discipline) and **architectural designs** (civil engineering). Since it is a tool that will benefit a lot of students, I have made a paper prototype for the application.

**FEATURES OF Sprout Pro HP Identified** (features in italics have been used in the application).

***a.*** *Use screen to input background, images onto the Touch Mat.*
***b.*** *Edit images using the Touch Mat*
**c.** Design a model prototype / interior design.
***d.*** *Scan real world 3D object and get it onto the screen using the top camera.*
***e.*** *Add text to image, drag, resize*
***f.*** *Snap image from real time video stream, edit it - add clip art objects from an online library.*
***g.*** *Clipboard to hold all the recently created things.*
***h.*** *Stylus to draw/write things onto photo. Save as photo instantly.*
***i.*** *Paint / colour tool using the hand as the brush.*

**Shneiderman's Eight Golden Rules of Interface Design** were used while developing the paper prototype:

| GOLDEN RULE | HOW IT WAS INCORPORATED INTO THE APPLICATION |
|---|---|
| **Strive for consistency** | The design prototype remains consistent across different types of input (touch and stylus) and employs identical terminology throughout the prompts and menus. Also the layout has required changes for different modes – 2D and 3D model building. |
| **Enable frequent users to use shortcuts** | To incorporate this, various touch based hand/stylus gestures would be incorporated into the application. This would enable faster navigation. |
| **Offer informative feedback** | For every operator action, there would be some system feedback. For frequent and minor actions, the response would be a haptic or light sound feedback. While for infrequent and major actions, the response should be more substantial – alert sounds. |
| **Design dialog to yield closure** | Sequences of actions are organized into groups with a beginning, middle, and end. |
| **Offer simple error handling** | Through interactive feedback, the user would be allowed to revert back from errors made. |
| **Permit easy reversal of actions** | Since this prototype deals with creating a work of art / model there is an easy undo/redo options for the user to revert back to previous state. |
| **Support internal locus of control** | This application is entirely based on users actions. Everything from system input type, to saving a model prototype, it makes the users the initiators of actions rather than the responders. |
| **Reduce short-term memory load** | The universal clipboard caters to this. The users need not remember what they worked on recently, where it is stored. The application will fetch it on its own. |

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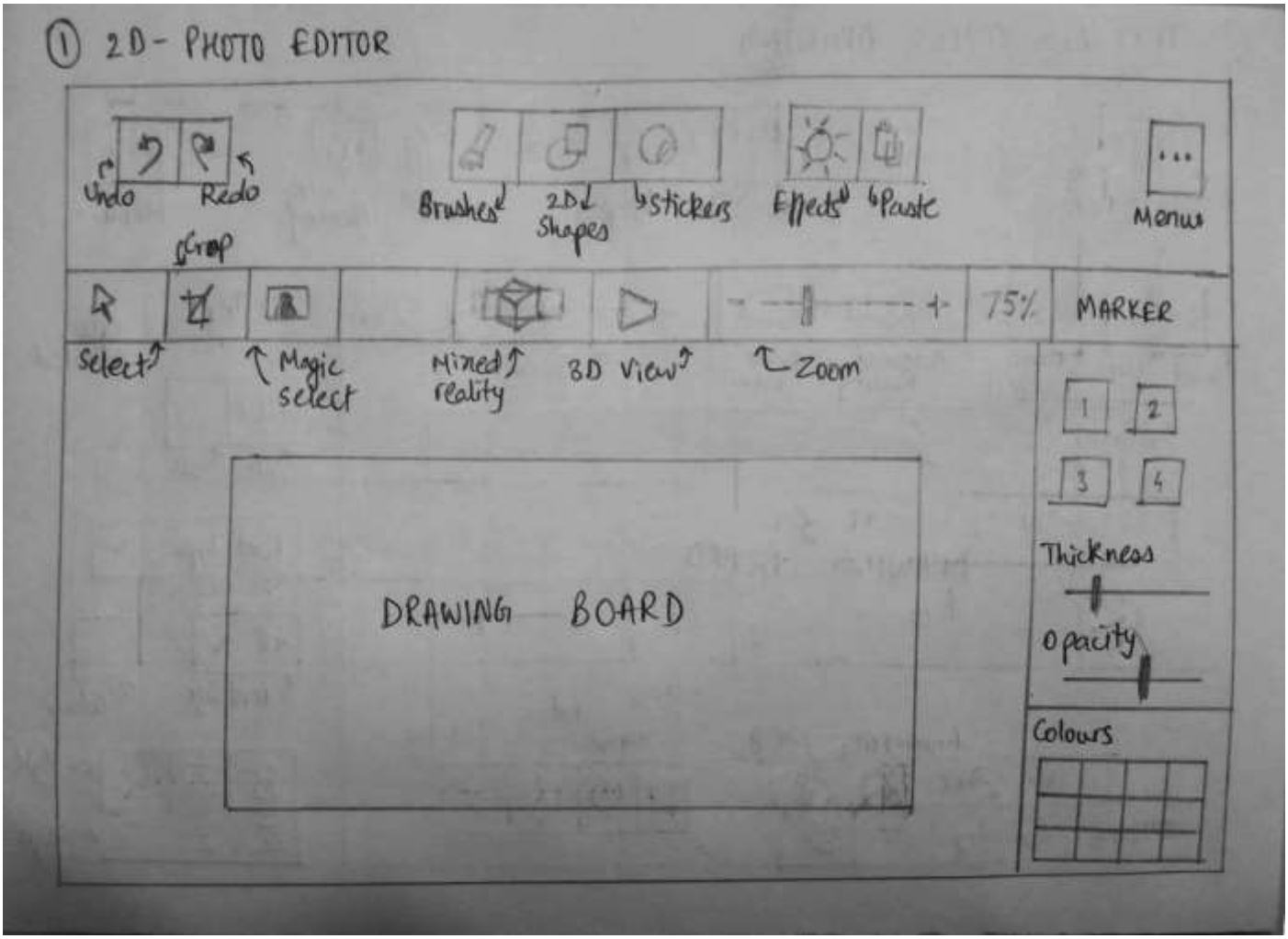
**DESIGN 1 of 4**




This is the design for **2D PHOTO EDITOR** on the **TOUCH MAT**

**Features:**

1. **Scan a 2D object** using the Sprout Pro's 2D scanning capabilities. Different types of 2D input – 2D shapes, stickers. **Magic select** to automatically detect humans in an image and crop them out.
2. Basic features clearly visible to the user: Select, Crop, Zoom in and out, Marker type – thickness, opacity.
3. Touch friendly UI with s**ufficient area to touch without making mistakes.**
4. Supports **3D view** and **Mixed reality view** of the model to fully use the features of Sprout Pro HP.
5. **Elaborate colour palette** for the marker used in 2D editing.
6. The user can use the numerous effects to **enhance the image**
7. **Easy reversal from error** – using Undo and Redo
8. Supports pasting text/image/clip art from the **"Universal Clipboard"** – explained later.
9. Menu option at top right which includes the "Help" option.

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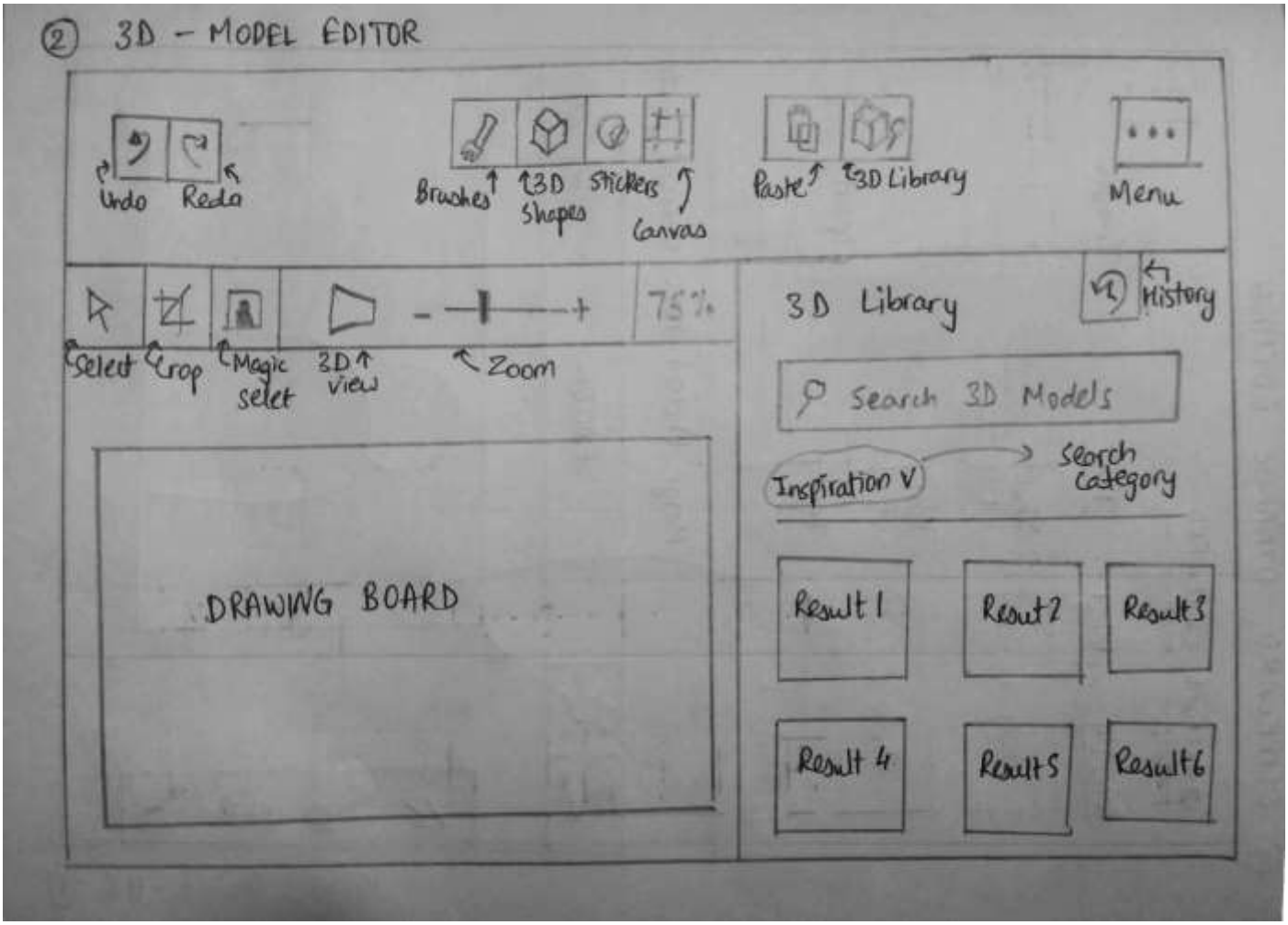
**DESIGN 2 of 4**




This is the design for **3D PHOTO EDITOR** on the **TOUCH MAT**

**Features:**

1. **Scan a 3D object** using the Sprout Pro's Advanced 3D scanning capabilities. Different types of 3D input – 3D shapes, stickers. **Magic select** to automatically detect humans in an image and crop them out.
2. **Important feature: 3D Library -** Since many people are just starting off with 3D prototype modelling, we can't expect them to design complex 3D models themselves. Instead, we can give them a 3D library from the application which they can use to build their own prototype models.
3. Basic features clearly visible to the user: Select, Crop, Zoom in and out, History of search in the 3D object library.
4. **Canvas** option to zoom out conveniently and see the entire 3D model using the Rotate view.
5. Touch friendly UI with sufficient area to touch without making mistakes.
6. Supports **3D view** and **Mixed reality view** of the model to fully use the features of Sprout Pro HP.
7. **History** option to keep the users recently used 3D objects.
8. **Easy reversal from error** – using Undo and Redo
9. Supports pasting text/image/clip art from the **"Universal Clipboard"** – explained later.

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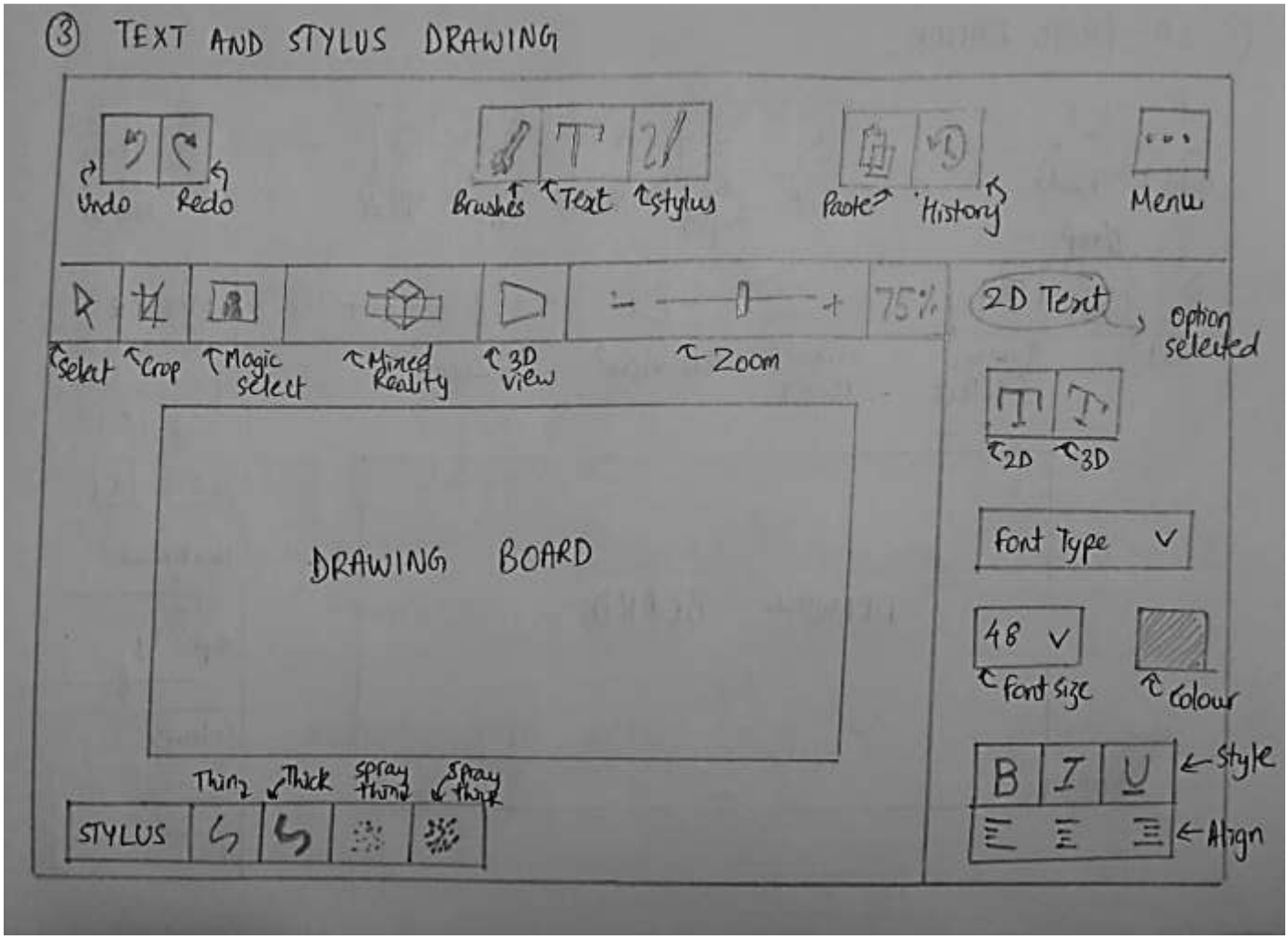
**DESIGN 3 of 4**

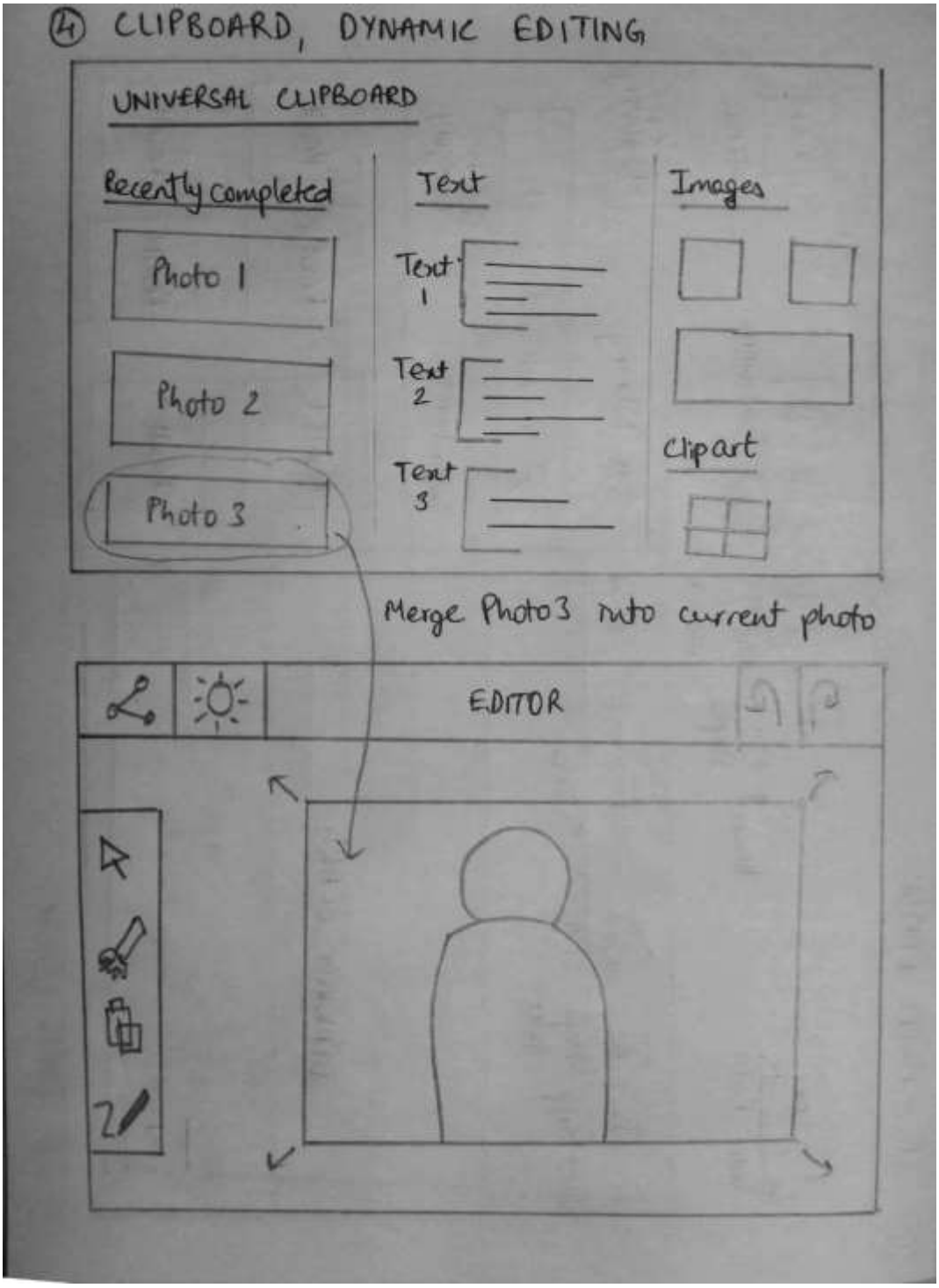



This is the design for **TEXT AND STYLUS EDITOR** on the **TOUCH MAT**

**Features:**

1. **Intuitive way** to input text onto the prototype using **computer input** or even **the stylus.**
2. **Supports 2D and 3D text. The options to modify text –** font type, font size, colour, bold, italics, underline and alignment **easily identifiable for the user.**
3. **Important feature: Stylus input customization –** The application allows the stylus input in 4 methods, line input (thick and thin) and spray input (thick and thin).
4. Basic features clearly visible to the user: Select, Crop, Zoom in and out. Paste option allows the user to quickly input text.
5. Touch friendly UI with sufficient area to touch without making mistakes.
6. Supports **3D view** and **Mixed reality view** of the model to fully use the features of Sprout Pro HP.
7. **History** option to keep the user's recently used text.
8. **Easy reversal from error** – using Undo and Redo
9. Supports pasting text/image/clip art from the **"Universal Clipboard"** – explained later.

**DESIGN 4 of 4**




This is the design for **UNIVERSAL CLIPBOARD** on the **MAIN SCREEN** and the **TOUCH MAT**

**Features:**

1. **Universal clipboard** is a smart of way to organize the text, images or 3D / 2D objects being used to build the prototype. The user does not need to keep track of the locations of saved files. If he used it recently, it will be there in the clipboard. This reduces short term memory strain.
2. **Intuitive way** to input text, photos or objects onto the prototype being built on the Touch Mat.
3. The user **uses gestures** like the drop gesture – *to pull an object from the main screen onto the Touch Mat*, **or** push up gesture – *to push an object from the prototype being built onto the Universal Clipboard***.**
4. Quick option to save and **Share** the prototype / image with others.

5. The user can use the numerous effects to **enhance the image**
6. Basic features clearly visible to the user: Select, Crop, Zoom in and out. Paste option allows the user to quickly input things for the prototype / photo.
7. Touch friendly UI with sufficient area to touch without making mistakes.
8. Supports **3D view** and **Mixed reality view** of the model to fully use the features of Sprout Pro HP.
9. **History** option to keep the user's recently used text.
10. **Easy reversal from error** – using Undo and Redo