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SENG 310
Assignment 4

1.

A Graspable interface emphasizes on the ability to manually manipulate objects. It uses “handles”, as specified in the paper, or manual controllers for functions on widget in the interface. In a graspable interface, there can be more than one input device that can be attached to different functions with each independently accessible. This can be used to take advantage of the size, shape, and position of the physical controllers to increase functionality. For an example, using two bricks to adjust and transform the size of the screen. Moving one brick up will stretch the screen vertically and moving the other brick to the right will stretch the screen horizontally.

Tangible interface, or “Tangible bits” gives physical form to digital information with bits directly manipulatable. It is more seamless in interacting with physical objects than a graspable interface. An example of a tangible interface is a computer mouse. Dragging the mouse on a desk will move the cursor on the screen in relation to the direction you are moving the mouse in. The relationship between the behaviour of the mouse and the cursor is clear.

By using physical objects, it allow users to engage a larger range of gestures and grasping behaviors but also to leverage off of a user's innate spatial reasoning skills and everyday knowledge of object manipulations.

2.

Tangible user interfaces not only have been used to make tasks easier for elderly people by providing an easier learning curve, but also to help users learn in the form of toys. For example, “Topobo” is a toy with joints where children can play with and connect to objects. Using the joints, it demonstrates how the object would move on a screen, given the joints it has connected. It teaches children to learn about balance, movement dynamics and anatomy. Moreover, tangible user interfaces are also used to problem solve, visualize data, entertainment, music, communication, and reminders. Van den Hoven and Eggen used tangible interface to create reminders by placing physical souvenirs onto a surface that will open a photo gallery on the computer associated to the souvenir.

3.

Sound Mites are small tangible nodes that change their behaviour depending on the number of nearby nodes. Each node will generate a musical tone according to the state of its neighbors as well as different coloured LED lights. What I find interesting about this interface is that each node is independent from each other, but all of the sounds that they make are dynamic. Suppose there are two nodes next to each other, adding a third node will change the sound of the first and second node. Placing a fourth node closer to the second node will change the frequency of the second node more than the other nodes according to distance. Therefore, by rearranging nodes around in real-time, you can create different musical tones each time, even if you move only one node around the other nodes.

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4.

A proposal for a tangible interface based around sculpting objects or terrain. Currently, assets and character models for games and terrain in level design are created using software such as MudBox, Maya, and game engines like Unreal Engine or Unity. In order for people to make these assets, they need to learn the tools that allows them to perform specific tasks as well as concepts for 3D modelling such as ray tracing and rasterization. This interface will allow users to physically sculpt an object with clay and translate it into a game object by a scanning mechanism. The idea would be most similar to a reverse 3D printer.

Users will interact with the tangible interface by making the object with clay on a surface or platform. As the user is sculpting the object, it will update the game object on the computer in approximately real-time. The scanned 3D object will maintain all of its edges and vertices and can be interacted both physically and on the computer by spinning or rotating the game object. Shaders and textures can then be applied on the game object using game engines as usual.

Unlike the traditional graphical interface of using the mouse and keyboard to sculpt objects for games, this tangible interface will allow all users to create game objects without needing to know how to use software. Devices like a fMRI scan only return 2D images, and paper can be only scanned as a document. There is no device that are able to translate a physical 3D object into a 3D game object. Ultimately, this tangible interface create opportunities for people and artists who prefer a more “hands-on” approach, a chance to utilize their skills and expertise in other areas.