Beauty, Form and Function in Typography
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Sthiti: A Digital Keyboard to explore Typography in Virtual Reality & Augmented Reality continuum

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Abstract: Sthiti is a digital keyboard which provides an experience of bringing typography to life, by playing around its beauty, form and function in Virtual Reality & Augment reality domain. The experience is experimental and exploratory in nature. The experience revolves around using phone capabilities like motion sensor, gyroscope function, depth of fields etc. Sthiti effortlessly create stunning typography in a specific context. The goal is to enable storytellers, brand managers & people communicate effectively across devices using an inbuilt messenger and a fun camera app. The study also helps in understanding the personalities of types in such space. The extension of the paper shall explore developing manual for digital typography.

Key words: Keyboard, Virtual Reality, Augmented Reality, digital, space, time

1. Introduction

The function of typography is to communicate a message so that it effectively conveys both its intellectual meaning and its emotional feeling. This is a cognitive task, making use of letters and words, which can be recognized and comprehended by the reader. At the heart of good typographic design is a critical interpretation of the meaning of the message: the more astute the interpretation, the more effective the design. Form is

important to the emotions. Form is the aesthetic component of design; it is what attracts attention, invites participation, and offers enjoyment. Our day-to-day life is enriched or degraded by the aesthetic qualities of our environment. Typographic form and message content are inextricably linked. Even the simplest design not only objectively conveys information but also gives subjective cues for the interpretation of this content. Typography seeks to integrate and balance form and function, recognizing the importance of each. Function without form is dull; form without function or purpose lacks substance and meaning. Aesthetics are more difficult to judge than the clarity of a message because aesthetic taste is more personal and culturally specific. Using all these points, Sthiti provides storytellers, brand managers & Consumers communicate with each other to create an engaging, fun and meaningful conversations in AI and VR domain. It also adds new knowledge in design academic field of Typography in 3D immersive space.

The question that this paper will thus examine is how interaction methods for AR and VR could be continuing to develop. It will present a concept sketch for one such interaction method, a digital keyboard. The new keyboard uses the modalities of vision like depth of field & sound to create a new set of immersive experiences for its users

2. Framework

The paper adopts experimental and exploratory approach to realize the typography through a digital keyboard and the qualities it brings along. The paper starts with a review of tools in the similar domain, experiments done with typography in Mixed reality domain. It then proposes a situation why an effective typography input method is needed and is supplemented by hand made prototypes for the keyboard. The experiment also includes concept sketches of how the keyboard shall be used. A proposed conceptual tool is then detailed with the help of sketches and use case scenarios. The use cases of messenger & camera app concept shall be discussed from different scenarios. This is followed by a brief discussion on how 'Sthiti' might evolve with time.

3. Background

3.1. Input methods for AR and VR

Various academician and industry people have developed tools for text input. Corporations like HTC and Google have developed their own version of input tools for Virtual Reality. Most of them are a direct representation of existing keyboards. Minium keyboard was developed for Google glass, HMD. Eric Whitmire et all [1] has worked in mapping input locations to an arbitrary action. Lee, Minkyung & Woo, Woontack (2003) [2] proposes an application for proposed system uses a fiducial marker to place the digital keyboard. This presents an adoption cost due to the marker.

3.2. The challenges of Text and legibility

One of the interesting work done in study of text legibility is the The Legible city. It is a pioneering interactive art installation where the visitor rides a stationary bicycle through a simulated representation of a city that is constituted by computer-generated, three-dimensional letters that form words and sentences along the sides of the streets. The letters join together to form coherent sentences legible to the visitor riding round on a bicycle. This form of representation consummates an idea hinted at the Middle Ages and

Baroque, namely that a relationship exists between syntax and structural design, between architectural and alphabet. [3]

3.3. Messengers in AR and VR

Tada-time is the first AR messenger which Combines traditional text chats along with augmented reality. It allows you to say what you really feel and go where you really want to be through a personalized 3D avatar.

3.4. Camera apps in AR and VR

The concept of using AR stickers has been an active field of study within HCI since the later versions of snapchat & Instagram's. Long before the technology itself was available, researchers such as Minsky[4] imagined future humans using technology to experience and influence environments physically remote from themselves in intuitive ways.

4. Manual for 3D Calligraphy

Humans communicates by verbal and nonverbal speaking or writing. Spoken language is ephemeral and intangible, it disappears as soon as it is uttered. When written in digital, language is captured in a visual and spatial form, ephemeral, permanent and concrete. However, there are various opportunities when we change the medium to 3 dimensional. Pointing to the huge difficulties in trying to import the legible or well-constructed forms of 2-d into the 3d immersive environment leave us with the question of how letters—our essential building blocks of reading—will exist in this new space. It's an interesting opportunity to study how Physics, gravity, orientation of viewers and types, textures etc. affects forms and function of Typography. Types in our real world is concrete. Their existence is acknowledged when we see and read them. However, there is a need for computational device such as Glasses for augment realities application and Virtual Reality boxes for fully immersive view. These types are experienced only when we have these devices.

For a typography, Script lays the foundation for its identity. I have manuals of various scripts provided by Prof Santosh during the typography course. All these scripts are for 2d

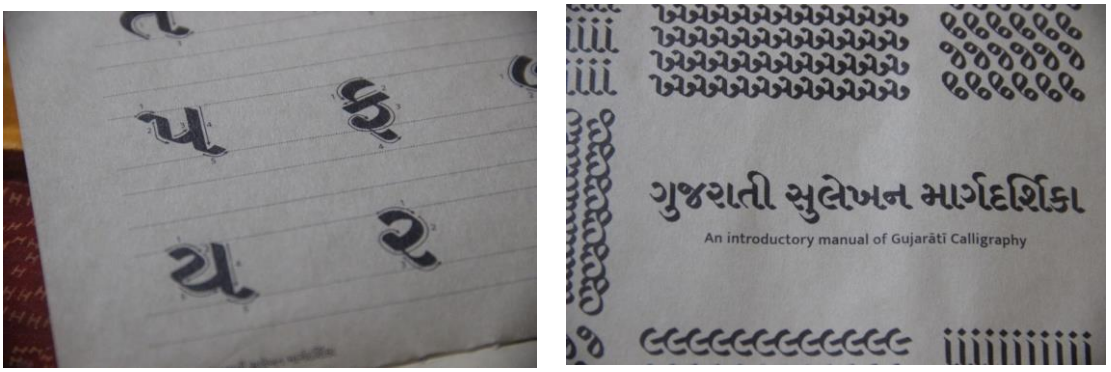

Figure 1. The base Manual for Calligraphy

surfaces. There is no manual for scripts for 3D surfaces. The work in progress of this paper's extension is working on I form the foundation of a Language.

"I absorb how will a Language sound like..

I am a timestamp of a civilization..

I am created..and reflected in forms..I never die..

I am a Script.'

The exploratory nature of the paper includes analyzing various facets of Typography/Script: Tools, Medium, Surface, Letter form and Space, Speed. There is no written typography manual of the scripts in 3D space. The future paper & essay will talk about the same. These manuals will provide typography community to standardize the typography keeping beauty, form & function in mind.

5. Further integrations

Based on the current growing usage of phone with AR SDK & emergence of hardware tool for VR, we see a possibility of number of interaction methods in these realities. Intersection of AI and machine learning, these tools will be more efficient.

For Virtual Reality keyboard, we can add a tangible element to pressed keyboard as mentioned in the paper [2].

6. System Overview

The proposed keyboard derives its name from the concept of the existence state. It helps in defining a form of the digital world. This form augment in augment reality & complement in virtual reality? This state is shared by an individual or a number of people at a given dimension of time across the spaces. What will be its next state? Is it contextual? The keyboard finds its usage in the human to human and human to world communication. Augment reality keyboard exhibits the qualities to create an immersive experience of senses like modalities of sound & vision. Virtual reality keyboard uses the sense of sound, vision & touch.

6.1. How 'sthiti' will make you a better communicator?

Sthiti is a marriage of an unconventional digital keyboard & a fun camera app. It has a multiplayer game for user engagement.

The keyboard features control of detection of context, gravity, orientation, sound, depth of fields for the typography. User can share the media on social media.

The keyboard provides people a unique strategic way to interact in the real reality with typography elements. It has a capacity to send messages via an inbuilt messenger. The beauty, form and function of typography are set in accordance to context using machine learning & AI. Eg, for the water environment, the typography is made hydrophobic or hydrophilic.

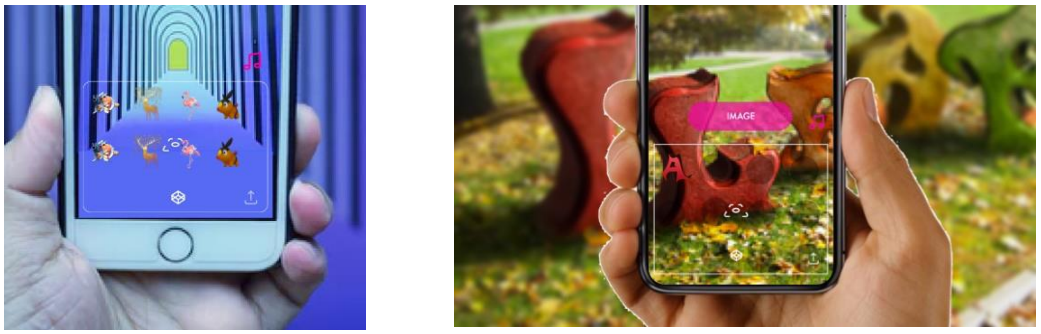

Figure 2. Emoji panel and alphabet panel of the keyboard.

The camera app consists of a pre-defined template which helps people capture & share their live memories states on the social media.

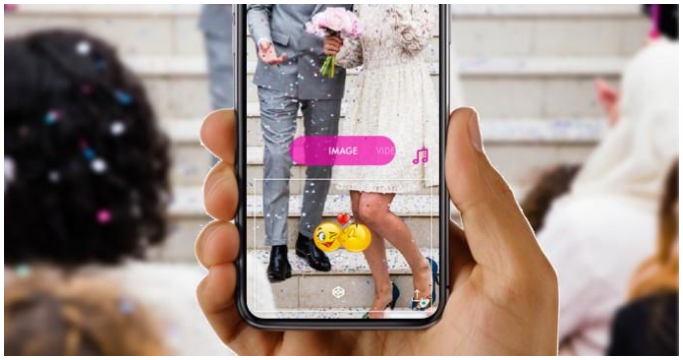

Figure 3. Using fun camera app of the keyboard.

6.2. Applications

6.2.1. Multi user scenario

A way to illustrate the multi user scenario is a fun game via an internal typography messenger. The form, beauty and function of a typography element can be adjusted which act as a playground for characters to play around. Type is constructed with light based on the additive color system. We can observe it from any angle just like real-life objects. The parallax effect between the type and the environment makes it even more magical, especially when there are multiple types layered in mixed reality space.

Figure 4. Multiplayer game on the Sthiti keyboard

6.2.3. Single user scenario

This keyboard has the capacity to absorb current human behavior of creating, modifying a memory, image or video using various editing tools and sharing it on social media. The word ‘sthiti’ means a ‘state’. A state is a function of time and the context. The keyboard acknowledges and shares a ‘state’ of any event. When we talk about type in 3D space, we tend to think extruded 3D text. However, besides some logotype design or limited

applications, I don't think extruded 3D text gives us that much value. Extruded text degrades the readability, especially for displaying information. Sthiti enables us to play around forms.

Figure 5. Sharing of 'States' on social media

7. Experimental setup

As a part of experiment, types were made of wires and viewed from different angles to determine a threshold. This threshold helped in determining the angle at which the identity of the alphabets remains intact. The orientation of the alphabet can be made in sync with moving phone for AR and VR, using phone hardware like accelerometer and motion sensor.

Figure 6. Seeing a wire devnagari alphabet from different angles for legibility study

A mockup of the phone using a cardboard was made. To experiment with a spherical form of alphbets, a wire was used to join the spheres.

Figure 7. Mockup of a keyboard and circular shaped types. Types can be rotated and placed as per the scene.

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8. An economy around sthiti

The Sthiti keyboard may be used to create and modify content for Augment reality & Virtual reality space. The keyboard enables storytellers & people communicate effectively. With the initiative to launch 'States' across social media, brand managers might see wonderful opportunity to showcase their brands using 'States'. Versions of states templates can be subscribed by the people to create their own 'States'.

9. Discussion

The paper has primarily talked about a digital keyboard for the augment reality. There has been an exhaustive research going on in Virtual reality space for the input methods. In the near future, 'Sthiti' will find its own shape and version for VR space. While these alternative realities will become a mainstream part of our society in the near future, there would be a real need and validity of various integration methods and tools. Apart from tools like 'sthiti', we need an understanding of how text can be played around for beauty, form and function in a most effective way. There is a need for approach beyond thinking 2d text extrude to 3d.

10. Conclusion

This paper presented the potential input methods. On-going work is exploring how to improve not only the interaction within these approaches but also other text entry methods, with the aim to publish a larger scale study with a range of different augmented and virtual reality text entry interfaces. The work is in progress. A manual of calligraphy shall be discussed upon in the coming months.

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