PORTFOLIO

3D art, interactive art, data visualization.

Yilin Zhu
2014–2020
The Bonsai of Family Trees
Visualizing Relationships in the Chinese Biographical Database

DATA
As large amounts of genealogical data are gradually made open and accessible, people can use historical documents to link individuals and trace back family histories. The data from China Biographical Database (CBDB) and Shanghai Library stimulated our curiosity to explore our own location in the ancient family blood branches.
By linking the individuals into tree-like shapes, we visualized forests, or sometimes jungles. There were a lot of abnormal horizontal lines bothering us. We discovered that all these lines led to an individual with two fathers or grandfathers, a kind of logically impossible family tree. Discovering this phenomenon inspired us to investigate the authenticity of genealogy in ancient Chinese society and to use literature records to examine the causes of unreasonable father-son relationships.
The 22nd Milan Triennale, Milan Italy, 2019
20cm X 20cm X 10cm  Laser Engraving

We laser engraved four representative family trees into glass bricks of dimension 20cm x 20cm x 10cm, breaking them out of their 2D form to better demonstrate the differences between families.
Every family has its own unique tree. We scaled each tree down to 10cm X 10cm X 10cm to form a family forest, displaying various complexity and structure among those families.
Mr. REAL is a project made for Global Game Jam 2018 held at Unity Shanghai, China. The theme is Transmission.

Physical, chemical, social and informational transmission happens around us every day. Among them, information is what we feel and experience the most as the Internet is becoming a modern necessity. Internet carries an enormous amount of information flow, and gradually shapes the digital society we live in today. However, Internet can be deceiving to the public when fake information prevails and people choose to believe in the rumor rather than the truth. This problem will get much worse with advancing technology where we can edit photos, sounds and other media at will but still pertain the realism. We want our game to touch on this topic, show the social significance and be thought-provoking.

Mr. REAL is a hacker fighting for digital image originality in the 2050s. In this era when all the Internet celebrities glorify themselves and sell fake goods to make money, Mr. REAL can intercept the uploading image as soon as the celebrities click the “upload” button. His mission is to restore the real appearance according to the celebrity’s various posts on social media.
The gamer plays the role of Mr.REAL in the game. The mission is to restore the real appearance of celebrities using information from their or others’ social media posts. The player should distinguish the authenticity and reliability of each piece of information. The goal is to restore the truth. Avoid misleading the public by either restoring insufficiently or too much.

Opening scene is a vivid illustration animation of a celebrity posting her touched selfie. After restoring the appearance, the gamer can see how close the result is to the true answer, and what the overwhelming comments will be for your restored picture.
In a study reported by Daily Mail, Professor Henry Roediger at Washington University in St. Louis had some interesting findings about public memory. He has been testing the ability of undergraduate college students to remember the names of presidents since 1973, and his current study compared results from the presidential recall tests among three generations of undergraduate college students.

The result revealed that most American public forgets their Presidents in 50 years. Things are not remembered long by regular people. Thus, the idea came that it might be meaningful to studying the time length of news from entering people discussion to fading away.
DATA

The first attempt was to collect data from Weibo and calculate the time of a topic entering and leaving the top 10 of Weibo Hot Search List. From the plot, we can clearly see some hot topics suddenly went down (because of media censorship in China), such as the huge blast in Ningbo city.

However, data from Weibo lacks diversity and does not represent the whole Chinese social media, since other large platforms and information sources exist. Micro Public Chinese system became our choice for this data source.

VISUALIZATION

Dozens of shocking news happened during 2017 in China, like the Jiang Ge Tokyo Murder Case and kindergarten abuse scandal of RYB Education, all causes an uproar on social media platforms such as Weibo and WeChat, but soon went down after a few days. People even stopped caring about the follow-ups, or whether the problem has been solved.

This phenomenon is represented as the ripples of stones thrown into the water. While some stone drops make huge and lasting ripples, others may have quickly disappearing ripples. When tapped on the center, detailed data will appear, showing the attention level per day, news content and representative comments.
Many amateur chefs are confused by complicated recipes. Lack of experience in procuring ingredients often cause difficulty to control the amount to be purchased, which leads to food waste. Therefore, we want to design a package that allows beginners to cook faster and save ingredients with a few simple steps.

**CONCEPT**

After intensive research, we defined the characteristics of our package:

1. People can quickly use the package according to the instructions.
2. Manufacturers can fill ingredients easily.
3. Add a precise amount of ingredients to reduce waste.

- Instruction for a single package
- A single package
- A 3-package combination
- The unfolded package

After intensive research, we defined the characteristics of our package:
1. People can quickly use the package according to the instructions.
2. Manufacturers can fill ingredients easily.
3. Add a precise amount of ingredients to reduce waste.
Seasoning Package

A2

A1

B1

C1

C2

C3

C4

Cross scoring line

optimized for transporting

where packages that can be

flattened are preferred.

Step number

Dashed cut lines

Ingredients

Detailed Steps
A Multiplayer Mixed Reality Game

TRIAL OF ZEAL

The god who is training disciples in his arena, who can place enemies and summon clouds.

The disciple ready to be trained; who must prove his/her determination to pass the trial.

Terrain is full of obstacles, causing more difficulty for the disciple to survive.

Representation of the disciple: It can be controlled to move around to avoid obstacles for survival.

Enemies summoned by the god. They automatically chase the disciple and try to hunt him/her down.

Clouds summoned by the god. Precipitate poisonous raindrops.

The emergence of Mixed Reality headsets such as Hololens opens up new possibilities for human-computer interaction. How can the next generation human-computer interaction be applied to real-world scenes and create new experiences for us? In this project, we explored a new form of digital entertainment in the context of mixed reality.
In the game, two characters are represented by geometry shapes for simplicity. The pink sphere is the disciple ready to be trained. It can be controlled to move around to avoid obstacles set by the god. The other player act as the god that can place enemies chasing the disciple automatically and summon clouds that have poisonous raindrops.

Clouds do not precipitate in the first 5 seconds and can be attacked by the disciple, giving the disciple some initiative to fight back, instead of passively avoiding all the time. The disciple must survive a 30-second round without being hit to pass the trial and prove his/her determination.

The game is designed to let you play wherever you are. It adapts to your environment through spatial mapping. A flat surface is first found for putting the game arena. Then the disciple player uses a game controller to move his character around, while the god uses voice control and gaze to call and place obstacles.

We used the HoloToolkit to develop the game in Unity. Its sharing library enables two devices to communicate and exchange data in real time. Models are made in C4D.
Beginning with a witty saying of an old Chinese guru: "The wind is not moving, the flag is not moving. It is the mind that is moving," we start to think how we can express the idea of whether what we see and believe is real in the form of new media. Our minds sense the world through our bodies, and believe what our bodies feel. We want people to ruminate on whether the everyday things around us are what we believe they are, and further more, are these things real at all?
With advancing technology, we are able to create this device that visualizes participants’ heartbeat through the oscillation/beating of a metal tree. A faster heartbeat will make the tree shake fiercely, while a slower heartbeat results in a nice and gentle heartbeat-beating movement of the tree. After the participant calms down, he/she will notice that the tree is actually oscillating in an unchanged frequency, what is changing is the frequency of the strobe light.

After several trials from the participant, the strobe light will be switched to a constant-on light, showing the blurring branches of the oscillating metal tree under normal lighting condition. Participants are led to think about the whole process, where they firstly believe the tree moves according to their heartbeat, then found out tree is constantly moving, and finally realize the light is changing too.

<table>
<thead>
<tr>
<th>Mode</th>
<th>X Frequency</th>
<th>Y Frequency</th>
<th>Light Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slow heartbeat</td>
<td>59.0Hz</td>
<td>60.0Hz</td>
<td>60.0Hz</td>
</tr>
<tr>
<td>Fast heartbeat</td>
<td>55.0Hz</td>
<td>60.0Hz</td>
<td>60.0Hz</td>
</tr>
<tr>
<td>Single-axis Oscillation</td>
<td>60.0Hz</td>
<td>0.0Hz</td>
<td>59.5Hz</td>
</tr>
<tr>
<td>Double-axis Oscillation</td>
<td>60.0Hz</td>
<td>60.0Hz</td>
<td>59.5Hz</td>
</tr>
<tr>
<td>Natural Light</td>
<td>60.0Hz</td>
<td>60.0Hz</td>
<td>0.0Hz</td>
</tr>
</tbody>
</table>

An Arduino Uno is used to control two electromagnets for oscillating the metal tree in two directions, and another Arduino Leonardo to control the strobe light. We use serial communication to send and receive data from a laptop running a webpage on top of Django framework. We can debug and test frequency combination easily from the webpage.

A 3D printed ABS frame was designed to hold the structure. The metal tree was made from thin metal plates, and fixed to the supporting rod grinded from a bicycle spoke using heat shrink tubing. Wood frame was laser-cut from 3mm wood plate. Strobe light was hand soldered from a cold and a warm LED light strip.
“Book ocean” is a Chinese phrase describing the infinite knowledge in books. Readers are swimming in the ocean of knowledge freely like fish. We would like to take this image to improve library reading experience, while promote reading paper books in a non-intrusive way in the digital age.

Since we want to emphasize the experience of reading and the sense of focus, only necessities such as reading lights are considered and distractions like phones are excluded.

We first tried to make a digital version of borrowing cards that come with every book. This card reflects the history of the book, including who have borrowed the book and when they borrowed. A custom fish comes with each book, whose species is determined by the category of the book. Readers’ interaction with the book will be recorded and reflect on the fish. Positive comments will make the fish joyful, while negative ones will sadden the fish. With more readers finishing the book, the fish will grow and become mature.
After discussion, we decided to choose a single piece of paper to represent the fish. Book pages construct the whole “book ocean”, where each page becomes a fish and a whole book forms a flock. Papers also have the flexibility to twist naturally, making them suitable for representing fish.

Readers borrow books through their phone. By showing the QR code to the scanner at the circulation desk, the flock of papers representing the book will dive into the ocean and swim out from the other side, accompanied with the book being popped out by the mechanism. The reader can then take out the book and start reading.

With a hidden camera in the reading light, we can record readers’ behavior and analyze their interaction such as commenting. A special pen with disappearing ink is provided to readers at the library so that their comments and notes on the book will be gone before the next reader borrow the same book. However, these writings do not vanish, as they are captured and stored in the database.

The circulation desk is the ocean where flocks of fish swim. When returning the book, a small flock of paper fish will swim into the ocean, each representing a page you have commented on. The touchscreen lets you tap on the fish, it will swim to you and show the page content, tap again and it will swim back to the flock.

1 - Bring up QR code for book
2 - Show code to screen to borrow
3 - Get book from the other side of the table
4 - Paper fish swarm in the screen
5 - Interact with fish by tapping
6 - Fish swims to front to show detail comments
7 - Gather fish swarm to sync notes to phone
8 - Phone with synced book pages
INVERSE is a short film that describes the main character entering an absurd inversed world by accident. You can see cars driving people around instead of people driving them, soccer balls kicking people, and hamburgers eating people. The scenes are all imaginary but show the possibility of stories that could happen under this assumption.