

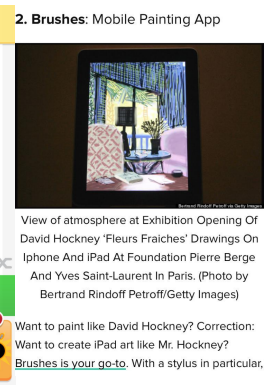
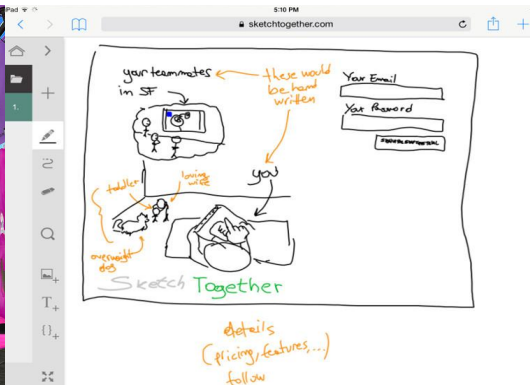
Splash!

Gestural and Mobile Interaction
Final Project Presentation

Shuo Yang, Siba Siddique, Yuanyang Zhong

Literature Review

- SketchTogether
- Splatoon - multiplayer game on Nintendo Switch
- Draw Something
- Brushes



2. Brushes: Mobile Painting App

Project Idea

“Using **around the mobile** gestures to create a **collaborative art** in public spaces on an online platform.”

Features:

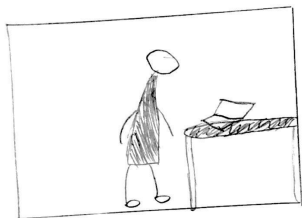
- Use mobile **as controller** (2D/3D)
- **Visual feedback**

User Target

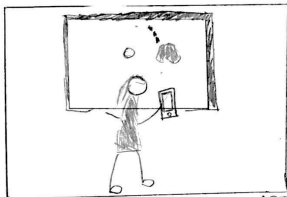
- For office workers to destress
- For kids to cultivate aesthetic ideas by combining different shapes and colors



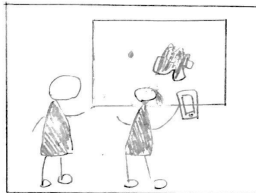
Storyboard



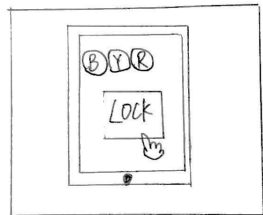
This is Jack, a programmer of creART company, he has a lot of works and feel stressful everyday



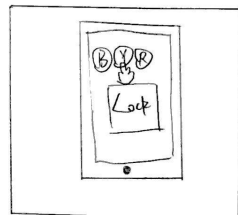
This is Ann, a HR of creART company. She is now playing Splashash! which is a game the company put in public space recently.



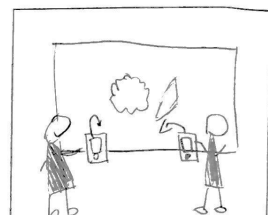
10pm, Jack finished his work, he pass by the public space and show huge interests in this game, so Ann invite Jack to Join



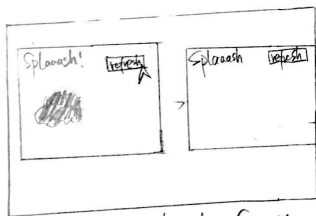
Jack Tap the Lock button on the phone to lock current target position



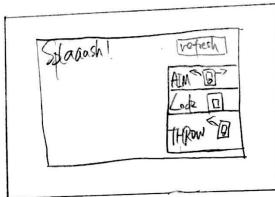
Jack choose Yellow as pattern's color



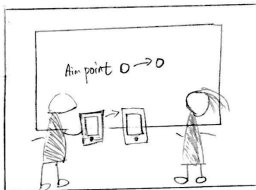
Jack throw straight then a pattern show in the canvas. Meanwhile, Ann throw left get another pattern



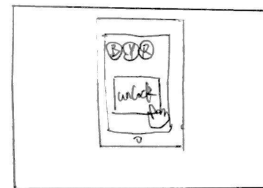
Ann first refresh the Canvas.



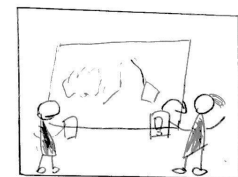
Ann ask Jack to follow the instruction Animation



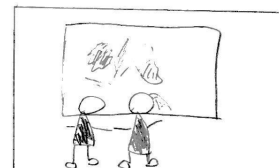
Jack Move the phone to aim



Ann want to paint another pattern, so she first unlock the position.



This time, Ann throw right and get another different pattern



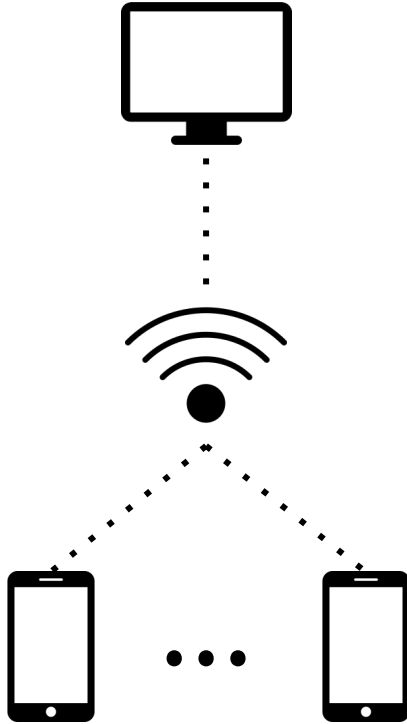
They finally make a beautiful artwork, They take a picture and become good friend

Demo

Gesture commands

Command	Gestures	Motivation
Manipulation of paint target	Phone held in hand vertically, tilt left/ right and up/ down	Observed from users given task to move on-screen cursor/ target
Launch paint	Phone held in hand vertically, quick jerk forward	Imitates action of throwing something
Choose color	Select from online palette	Element of choice given to user
Change pattern	Direction of aim (left or right)	Added flexibility to reflect real-life paint patterns

Implementation



Computer:

- Server: Node.js
- Canvas: HTML
- libs: jQuery, p5.js

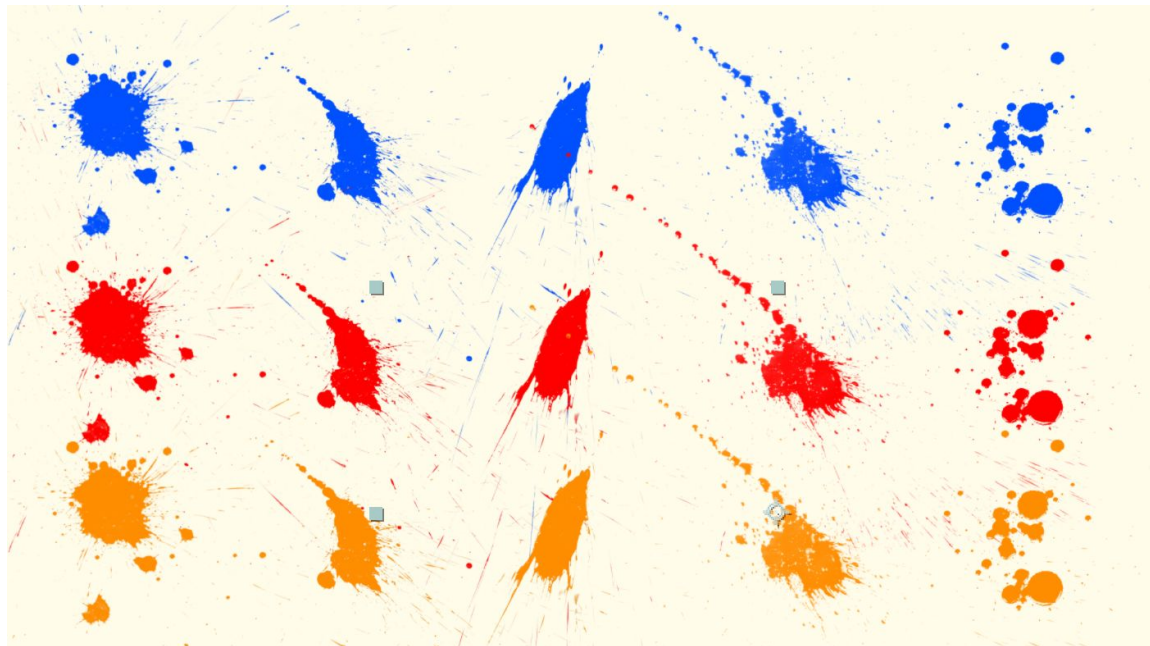
Local Network / remote server:

- Communication through socket
- lib: socket.io

Mobile Device(s):

- Controller
- HTML event to get sensor data

Implementation



Create patterns

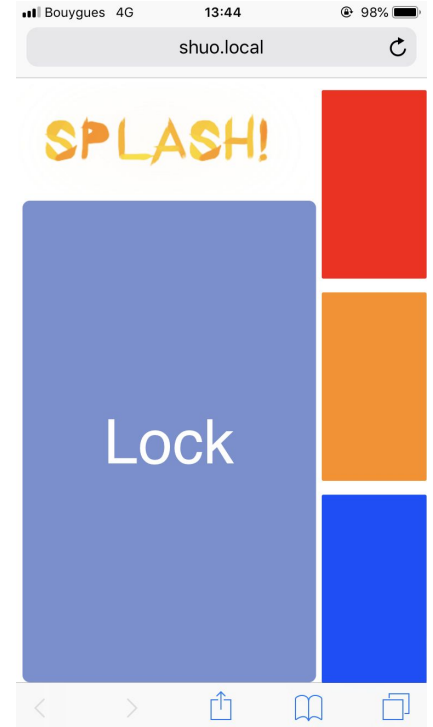
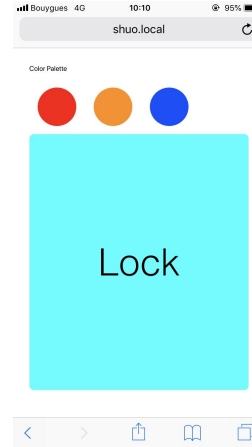
- After Effects, Photoshop
- 3 different color
- 5 different states(use 3 states)
- export as gif

Evaluation

- Easy learnability
- Lightweight
- natural interaction of mobile “as device”

Limitation:

- Sensor data is not stable



Evaluation

At first, we designed two ways to hold the phone: W1 is with the front of the screen facing the left, and W2 is with the screen facing the user.

Hypothesis: users following W2 will have more fatigue than those using W1.

Factors: ways of holding the phone {W1, W2}


Measures: degree of fatigue(NASA-TLX)

Task: users are asked to throw for 30 times, 10 for each direction.

Future work

- Better sensor calibration
- Customize background, patterns with paint dynamics
- Can be extended to incorporate serious game applications





Team

Shuo Yang

System Architect & Developer

Siba Siddique

Coordinator & Developer

Yuanyang Zhong

Designer & Animator

References

M. Fraser, S. Benford, J. Hindmarsh and C. Heath. “Supporting Awareness and Interaction through Collaborative Virtual Interfaces”. *Proc. of UIST*, 1999

C. Ferraris, C. Martel. “Regulation in Groupware: The Example of a Collaborative Drawing”. *International Workshop on Groupware*, 2000. ISBN: pp: 11. DOI Bookmark: <http://doi.ieeecomputersociety.org/10.1109/CRIWG.2000.885163>

Adding Real-time Functionality Using Socket.io

<https://hub.packtpub.com/adding-real-time-functionality-using-socketio/>