

HYELEE KIM PORTFOLIO

2013 - 2017

"I certify that the work included in this portfolio is my own original work. Work included which was conducted as a part of a team or other group is indicated and attributed as such- the other team members are named and a true description of my role in the project is included."

Table of Contents

1. Research

- (1) UROP at UC Irvine, Center for Embedded Computer Systems
- (2) Academic-Corporate Project : Wearable Wrist Device
- (3) Academic-Corporate Project : HMD

2. Creative Activity

- (1) Glocal Digital Cities : Interactive Documentary
- (2) Flocks : 3D Interactive Code Art
- (3) Breath : Interactive Media Installation
- (4) Strange Forest : 2D Indie Game
- (5) Liquid Humans : Virtual Museum Curation

CONTACTS

- saladhailey@gmail.com
82-10-4373-0314
www.hyeleekim.com
www.linkedin.com/in/haileykim822

3. Interaction Design

- (1) Petplant : IoT Device
- (2) UI/UX Design Projects : wStory, nevergoodbye

© Copyright 2018

CREATING SMART EMBEDDED SYSTEMS

RESEARCH INTERN

UNIVERSITY OF CALIFORNIA, IRVINE
UROP FELLOWSHIP
2017/6 - 2017/8

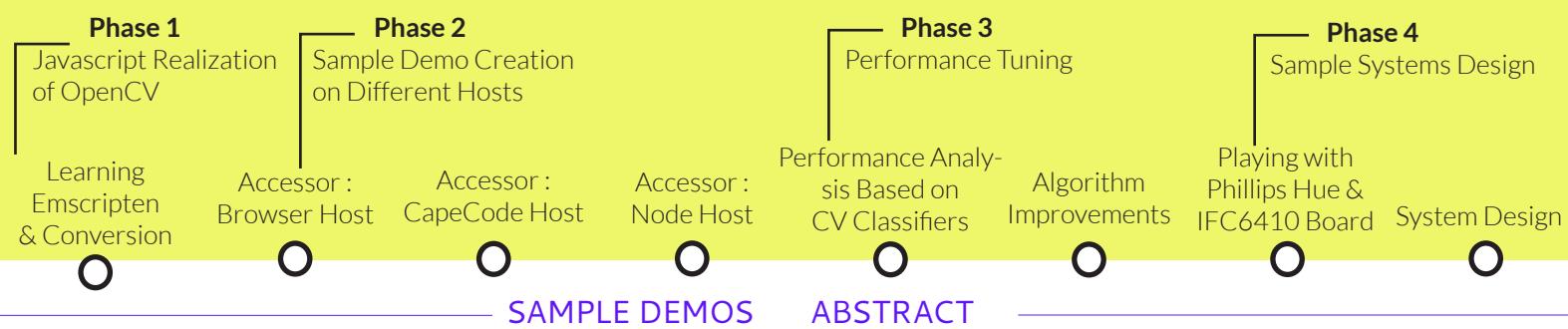
#EMBEDDED_SYSTEMS #IOT #OPENCV
#COMPUTER_VISION #JAVASCRIPT #SENSORS

This project belongs to UC Irvine, Center for Embedded Computer Systems and Mentor Prof. Alex Nicolau and Ph.D Sajjad Taheri



The project investigated Computer Vision in the context of IoTs to enable more dynamic interaction with the environment through analysis and extraction of meaningful data from images. I have taken part in JavaScript realization of OpenCV through designing and implementing sample demos, and tuning performance for the requirements in real time multimedia processing scenarios.

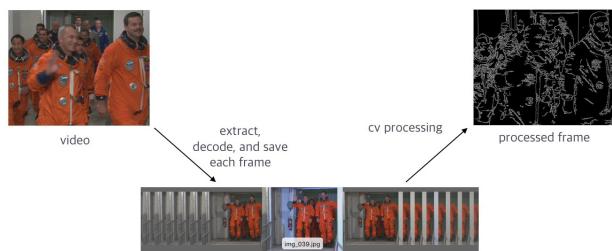
Find more about the project on [the official documentation](#).



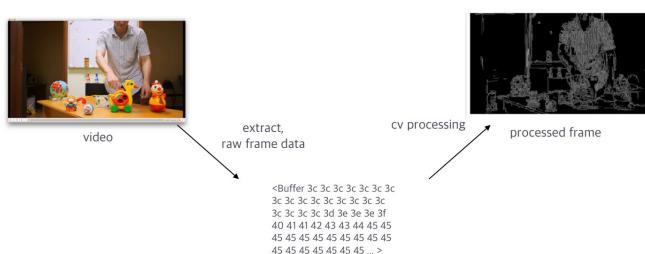
4-1. Simple Demo - Image Processing



4-2. Simple Demo - Video Processing



4-2. Simple Demo - Video Processing

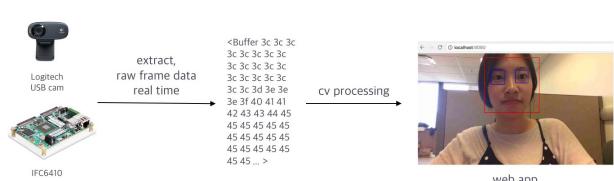


At Center for Embedded Computer Systems, I investigated computer vision in the context of Internet of Things(IoTs). In IoTs systems, computer vision is a critical components, giving them ability to interact with the environment more dynamically through analysis and extraction of meaningful data from images. Nevertheless, computer vision has been limited in it, as it is mathematically complicated and computationally demanding.

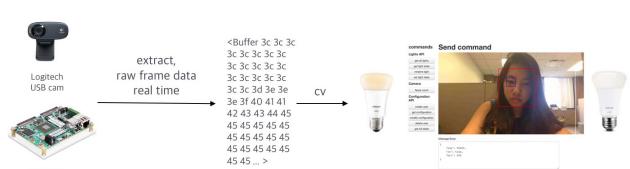
This projet investigates Javascript realization of OpenCV, the most widely used computer vision library, in the context of IoT systems. Through designing and implementing multiple demos, its applicability is demonstrated. I have further tuned the performance, as it is a must for realtime processing scenarios .

COMPLEX DEMOS

4-3. Simple Demo - Camera Processing



4-4. Complex Demo : Eye Gaze Detection + Phillips Hue Lamp



CONCEPT AND DESIGN OF NEW DEVICE WRIST DEVICE (F2)

RESEARCH INTERN

LG ELECTRONICS & SOGANG UNIVERSITY
2015/5 - 2015/12

#NEW_CONCEPT #WEARABLE #WRIST
#F2 #INDUSTRIAL_DESIGN #USABILITY



This was ACADEMIC-CORPORATE COLLABORATIVE PROJECT.

The project was implemented under the task to "Design wrist device which can be wrapped around the wrist and used as a smart phone as unfolded". The project proceeded in form factor research, design concept sketches, and 3D image prototyping and mockup production.

Mentor : Prof. YongSoon Choi / Collaborators : Doyu Kim, Jihyun Kim, Soomin Shin, Yeonsoo Shin

Transformative Factor Research



Design Concepts



Modelling



1st Prototype



2nd Prototype

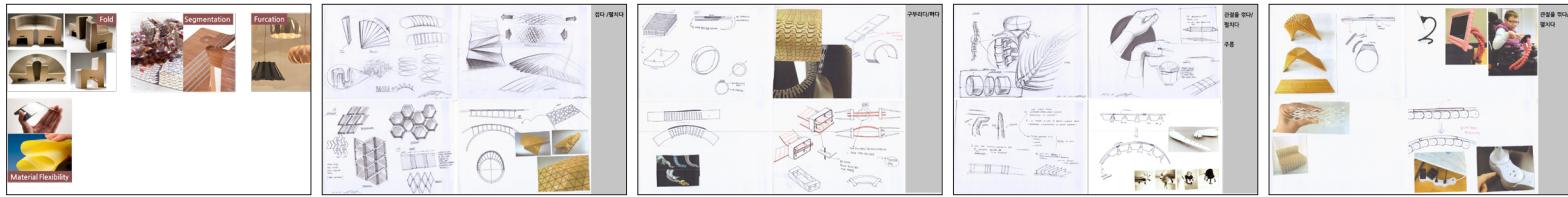


Final Prototype

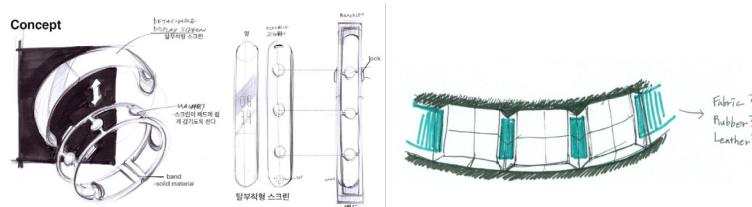


TRANSFORMATIVE FORM FACTOR RESEARCH

Different factors in form transformation and the application were researched based on the paper "Innovations in Design Through Transformation: A Fundamental Study of Transformation Principles, Journal of Mechanical Design, 2009" by Vikramjit Singh.



DESIGN CONCEPT SKETCH



PROTOTYPE MAKING



3D MODELLING



MOCKUP PRODUCTION



FINAL RESULT



CONCEPT AND DESIGN OF NEW DEVICE HMD (HEAD-MOUNTED-DEVICE)

RESEARCH INTERN

LG ELECTRONICS & SOGANG UNIVERSITY
2015/5 - 2015/12

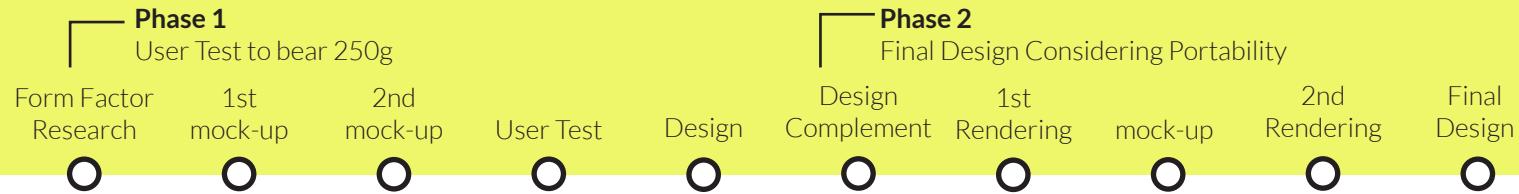
#NEW_CONCEPT #WEARABLES
#HEAD_MOUNTED_DEVICE #USABILITY #FLEXIBLE



This was ACADEMIC-CORPORATE COLLABORATIVE PROJECT.

The project was implemented under the task to "Design Head Mounted Device considering the wearability and portability". The project proceeded in form factor research, concept design, and 3D image prototyping and mockup production.

Mentor : Prof. YongSoon Choi / Collaborators : Doyu Kim, Jihyun Kim, Soomin Shin, Yeonsoo Shin



PHASE 1



Team has analyzed existing HMDs and categorized into four types : Helmet, Headphone, Hairband, and Glasses.



1st Mock-up

Type 1. 변형 안경 형 (캡 형 기반)

Type 2. 변형 안경 형 (헬멧 형 기반)

Type 3. 헤드폰 형

Type 4. 변형 안경 형 (머리띠형 기반)



2nd Mock-up



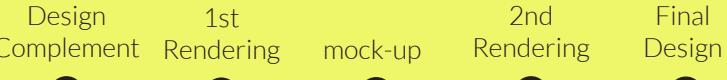
User Test



Design Sketch

PHASE 2

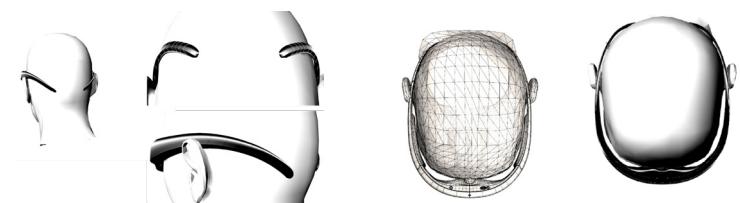
Final Design Considering Portability



PHASE 2



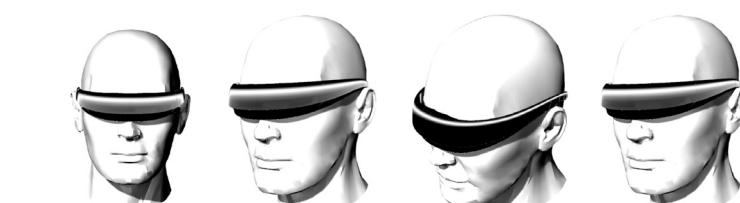
Design Complement



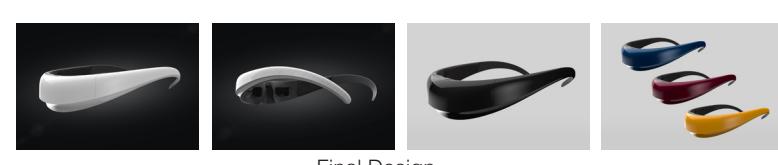
1st Rendering



Mock Up



2nd Rendering



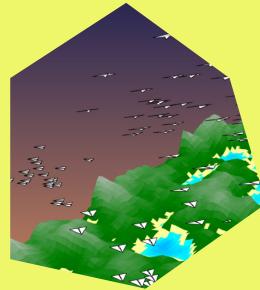
Final Design

FLOCKS- CODE ART

PROGAMMER

ACADEMIC PROJECT @SOGANG UNIV
2015/9 - 2015/12

#PROCESSING #INTERACTIVE #3D_GRAPHICS
#AUTUNOMOUS_AGENTS #NATURE_OF_CODE



"Flocks" is an interactive 3D graphics code art to simulate the natural flocking behaviors of the birds. Through project, 3D version of the autonomous agents was implemented referencing "The Nature of Code" by Daniel Shiffman.

Find [demo video](#) and [source code](#) links here.
Detailed content can be viewed [here](#).

Ideation

World Making

Object Design

Algorithm Design

Network & Installation

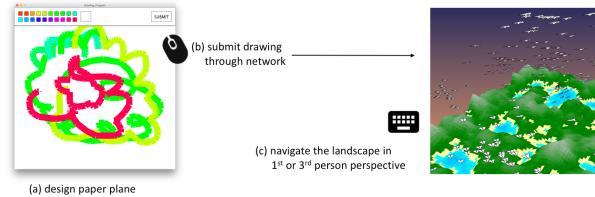


INTERACTIONS

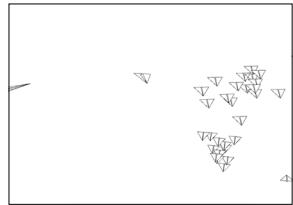
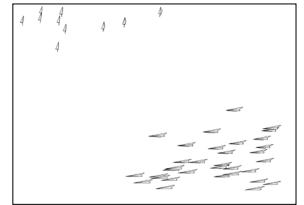
Viewers can design their own paper plane on palette and apply the design.

Viewers can explore the 3D space in two ways.

- (1) Viewers can either see the paper plane flocks flying autonomously in **3rd person perspective**,
- (2) or navigate through the virtual landscape with keyboard control in **immersive 1st person perspective** of the designed paper plane.



INTERNAL MECHANISM

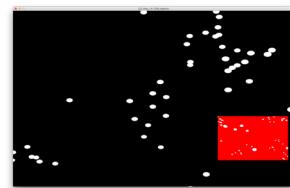
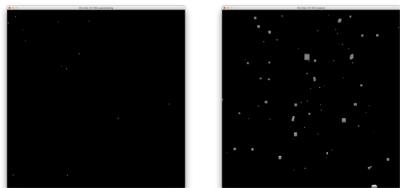


Three forces are applied to the flocks and control the autonomous flight of the paper planes.

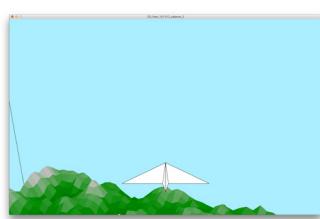
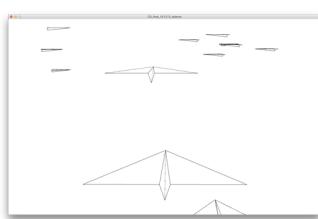
"Flocks" was a project to simulate the natural flocking behaviors of the birds. Through project, 3D version implementation of autonomous agents in "The Nature of Code" by Daniel Shiffman. The flocks of paper planes fly in a herd yet avoids the collision through three steering forces :

- 1. Avoidance** : check the nearby neighbors and steer away to avoid collision
- 2. Alignment** : calculate the average velocity of the neighbors to make them head the same direction
- 3. Cohesion** : steer towards to the center of the neighbors to stay within group

WORLD MAKING& OBJECT DESIGN

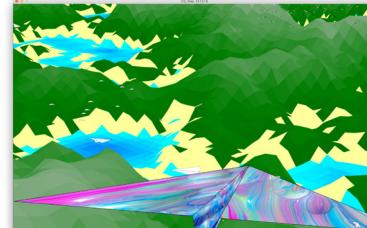


World making of 3D space with perspectives and objects



Object Design, Terrain and Sky Design

FINAL VIEW

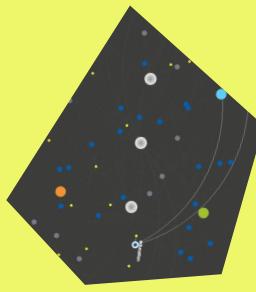


INTERACTIVE DOCUMENTARY “GLOBAL DIGITAL CITIES”

ARTIST

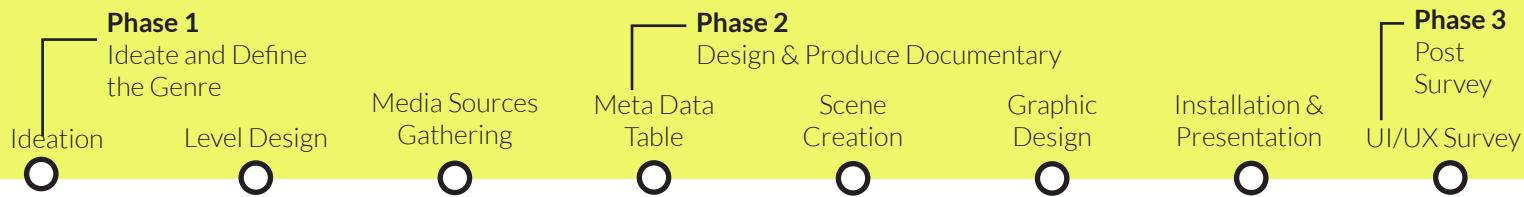
INTERNATIONAL WORKSHOP@MANCHESTER
2016/7 - 2016/8

#INTERACTIVE_DOCUMENTARY
#FUTURE_CINEMA #MEDIA_INSTALLATION
#ANNOTATION



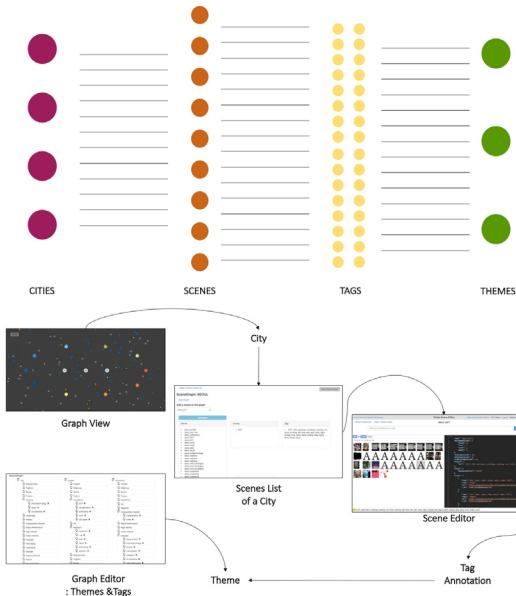
“Global Digital Cities” is an Interactive Documentary created in international artist team. The project is a documentary itself and web-based media platform for creating interactive documentary using Javascript and JSON. The project was hosted by Media City UK and University of Salford, School of Arts and Media.

Find more about the project in [official homepage](#). Detailed explanation can be found [here](#).



LEVEL DESIGN

Each **city** can have several **scenes**, each **scene** are **tagged**, and each **theme** also has tags. All the levels can be chosen as a sorting standard in the graph.

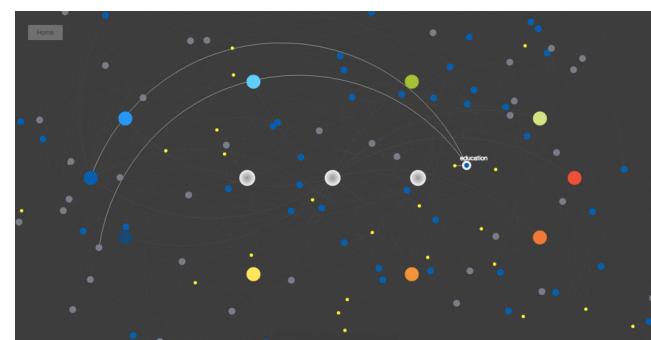


FINAL INSTALLATION VIEW



SCENE & GRAPH & EDITOR

Each city has several “**SCENES**”, the core micro-unit documentaries which is a set of media data which can be grasped within few seconds. Sound, video, image, and texts comprise scene. Each **scenes** are annotated with tags, which viewers can select with the graphic user interface to be shown on the final installation. The mood, dynamics can be adjusted in JSON format. On Graph Editor, cities and themes to be shown on the view can be chosen.



BREATH

MEDIA ARTIST

INTERACTIVE MEDIA INSTALLATION

2013/9 - 2013/12

#MEDIA_INSTALLATION #INTERACTIVE #IMMERSIVE

#ARDUINO



“Breath” was an interactive media installation with room size sculpture that brightens up and down according to the intensity of viewer’s breathe, as if sculpture is breathing together. Sculpture was weaved with spatial cells made out of balloons and vinyl, and LED stripe reacts according to pressure sensor and Arduio programmed code.

View the installation documentation on [vimeo](#).

This work won [Creativity Award](#) in Art & Technology Conference 2013.

This work was collaborated in artist team (Kim Deborah, Park Inyoung, Kim Chahyun).

Ideation

Mechanism Design

Arduino Coding

Electric Circuit Design

Sample Test

Installation



CONCEPT / INSPIRATION

People inhale and exhale endlessly. We can stop thinking, but never can stop breathing. Breathing makes humans more human. This act of breathing happens with the confrontation with something alien. We get inspirations from others, we share influences with one another. People share breaths in a sense far beyond mere biological action. In this sight, breath is an action that blows spirit between people. ‘Life’ is ‘light’. Without the presence of light, no creature can survive.

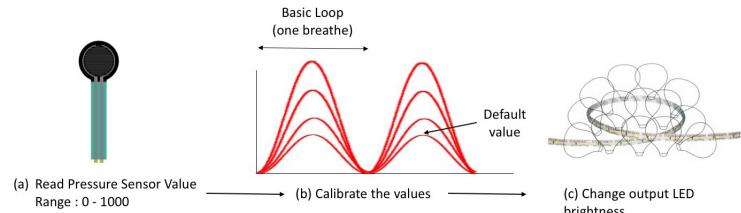
“Breath” try to express the concept using of light and the breath with the sculpture expanding spatial cell, to represent the lungs.

[Artist Interview](#) can be found here.

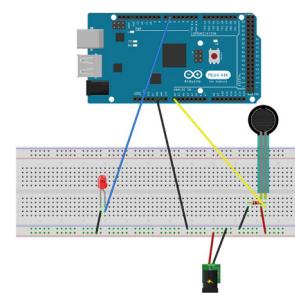
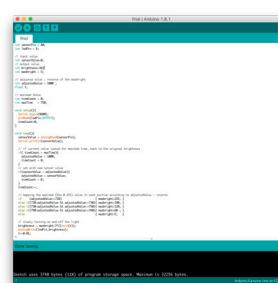
FINAL INSTALLATION



BASIC MECHANISM



ARDUINO CODE / ELECTRIC CIRCUIT DIAGRAM



The code is designed to simulate the breathing. The output brightness to LED strips brightens up and down with the default maximum brightness. The maximum brightness calibrates according to the value read from the sensor input values.

INSTALLATION PROCESS



2D GAME "STRANGE FOREST"

PROGRAMMER / DESINGER

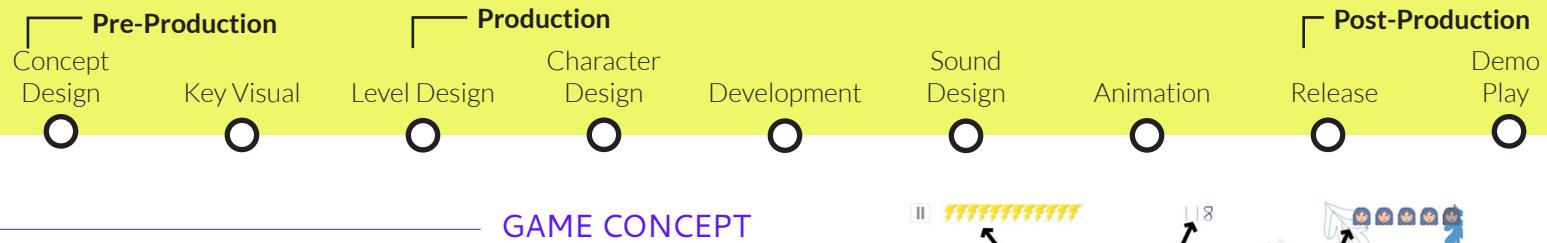
ACADEMIC PROJECT @ SOGANG UNIV
2016/9 - 2016/12

#SIMPLE_DIRECTMEDIA_LAYER #C++
#2D_GAME #CHARACTER_DESIGN #UML

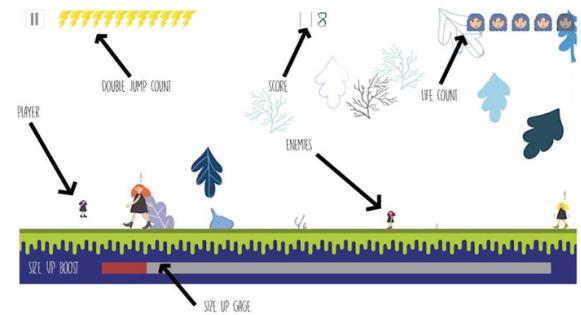


"Strange Forest" is a 2D computer indie game developed using SDL (Simple DirectMedia Layer) library, and C++. The game is executable in Windows setting.

Please download the game from [this link](#). Find view the demo play video on [vimeo](#).



Once the game starts, the player starts to walk and jump in the strange yet mysteriously beautiful forest full of flowers and trees. The player finds out that this forest is a cannibal as he/she faces enemies coming from the other side of the road. The player has to eat the smaller enemies and avoid bigger enemies in order to survive in the forest, using simple jumps with keyboards.



VIRTUAL MUSEUM CURATION MUSEUM OF FUTURE HUMAN -LIQUID HUMANS

CURATOR

ACADEMIC PROJECT @ CITY U, HONG KONG
2016/9 - 2016/12

#POST_HUMAN #NEW_MEDIA_ART
#CONTEMPORARY #CURATING #CYBORG



As part of the class project for "Contemporary & New Media Art" at School of Creative Media, I have designed the concept of virtual museum and curated the exhaustive permanent exhibition for the museum.

Please download the pamphlet of the virtual exhibition "Liquid Humans" with [this link](#).

INTENTION

"Liquid Humans" is an online curation project & exhibition held in virtual museum 'Museum of Future Human'. MoFH aimed to record the historical moments in humanity when the definitions of humans have radically changed and expanded with the technologies, and to predict the future of humanity upon reflection. The exhibitions questions about humans in order to understand ourselves better in objective perspective and to acknowledge the blurring boundaries which might first come bizaare.



PETPLANT

PROGRAMMER

ACADEMIC PROJECT @SOGANG UNIV

2014/3 - 2014/6

#PHYSICAL_COMPUTING #ARDUINO #ZIGBEE

#INTERNET_OF_THINGS #USER_EXPERIENCE

This work was collaborated with Kim Suyhun.



"PetPlant" is an IoT device using Arduino, Zigbee and sensors. "PetPlant" was inspired by "Tele-garden"(1995-2004, Ken Goldberg) to build a communication with the plant. "PetPlant" can have interaction with humans by patting just like animals by spitting emotional sentences according to human's touch. "PetPlant" also alarms the users about its condition with automatic humidity check.

[View demonstration video on youtube.](#)

Ideation

Circuit Design

Arduino Coding

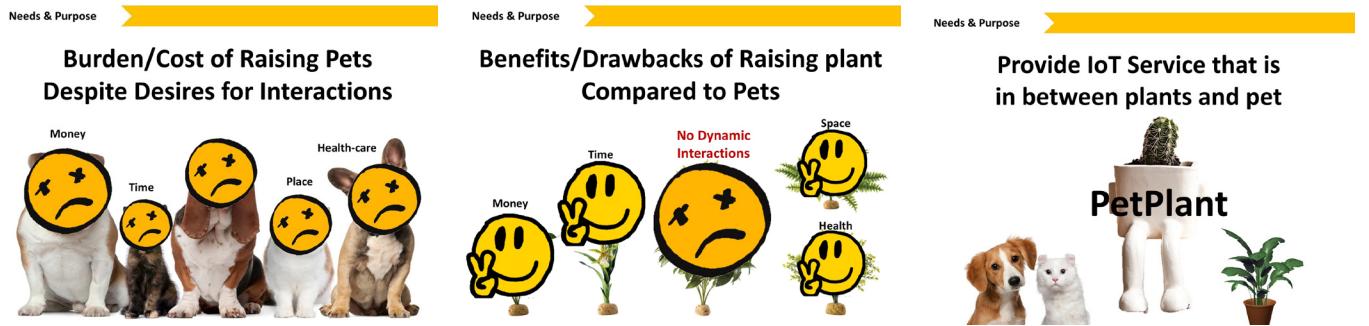
Serial Communication

Fabrication

Demo Presentation

NEEDS & PURPOSES

"PetPlant" was designed to meet the needs of people who find it burdensome to raise pets but who also finds lack of dynamic interactions with plants boring. "PetPlant" is a IoT service which provides active interactions with plants with less burden of cost, responsibility, and time.

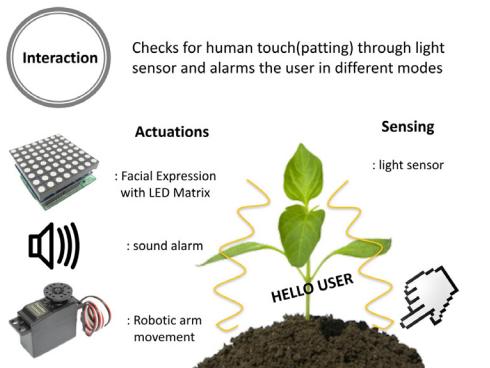
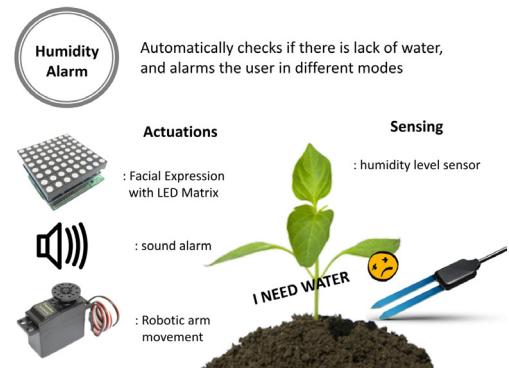


FUNCTIONS

"PetPlant" provides two main functions :

1. Humidity Alarm : PetPlant automatically checks for the humidity level and alarms the user with voice, facial expression, and robotic movements if there is need to water the plant.

2. Interaction : As user touches the plant, the designed pot senses the patting through the lighting sensor. Plant reacts with facial expressions (LED Matrix), voice, and robotic movements of the arms attached to the pot.



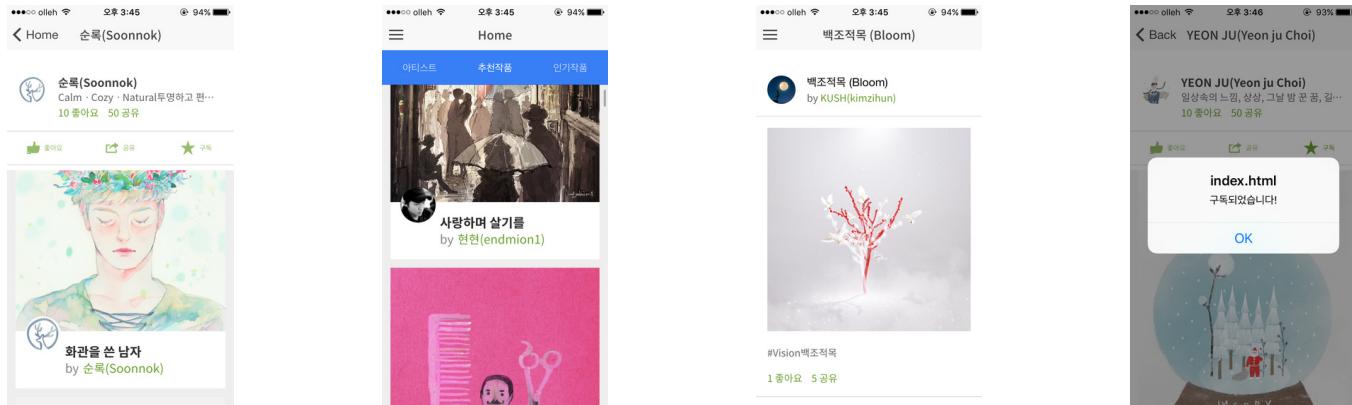
WSTORY: MOBILE APP

UIUX DESIGNER

ACADEMIC PROJECT @ SOGANG UNIV
2015/9 - 2015/12

#ANDROID #APPLICATION #SUBSCRIPTION
#USER_INTERFACE

"wStory" is an Android mobile application which provides illustration subscription for the background screen and periodically updates the users with new illustrations. (currently not under service). I worked as a planner and UI/UX designer.



NEVER-GOODBYE

UI/UX DESGINER, PLANNER

SOULLAB CO.,LTD.
2015/1 - 2015/4

#APP #WEB #USER_EXPERIENCE #INTERFACE
#COUPLE_MATCHING_SERVICE

Please refer to the [official homepage](#).

Working as an intern, worked on the developing stage of the scientific couple matching service "Never Goodbye" : scientific algorithms targeted at users ranging from 25-35 looking forward for a serious long term relationship. I particularly participated in the building algorithm based on questionnaire with 35 areas, 60 questions using MVM(Mate Value Matching) methodology, which earned Korean patent, and designing mobile and web UI/UX.

