

Cal Chiu



Engineering Student - INSA de Lyon, France
Research Graduate - Tohoku University, Japan

Digital Arts, Game Dev & Tinkering hobbyist

2019 First Semester

**Creative Content
&
Engineering
Portfolio**

TrueMotion

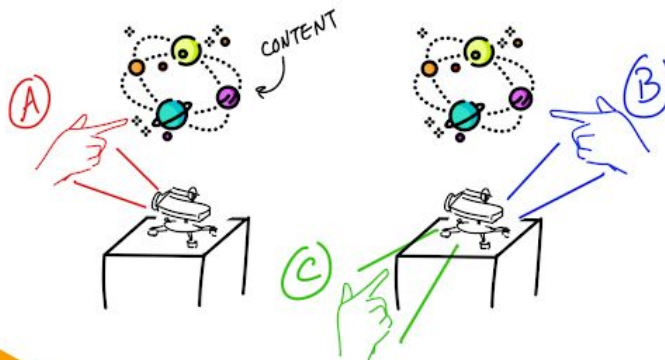
A wearable hand tracking device with full body range for enhanced user freedom in VR !

Research paper to be published at SUI2019



I designed and prototyped a simple, low-cost and flexible solution to **camera sensor range limitations** for **hand tracking in VR**. The device follows the user's hands around itself, providing extra range and user freedom.

DESKTOP MODE :



Multiple capture angles for static content



Turn based interactions for collaborative tasks

WEARABLE MODE :

Users can benefit from **real-time** single or dual hand tracking for mobile and **room-scale VR**. Gestures are detected from head to lap.

Leap Motion Sensor

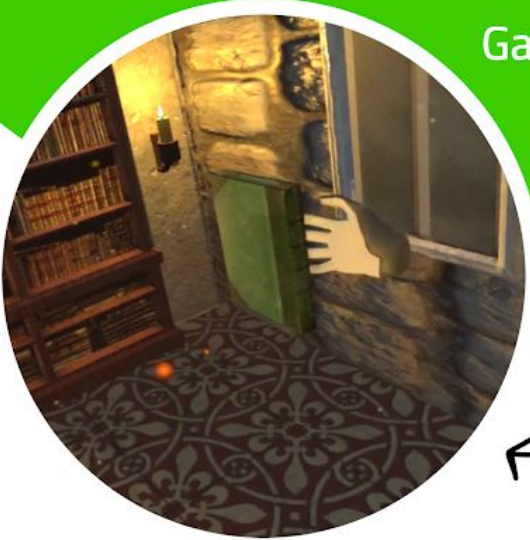
Repurposed Drone Gimbal

GoPro Torso Mount

TrueMotion Applications

Creative contents to demonstrate the capabilities and benefits of TrueMotion !

Games featured at SIGGRAPH Asia 2019's Extended Reality Program !



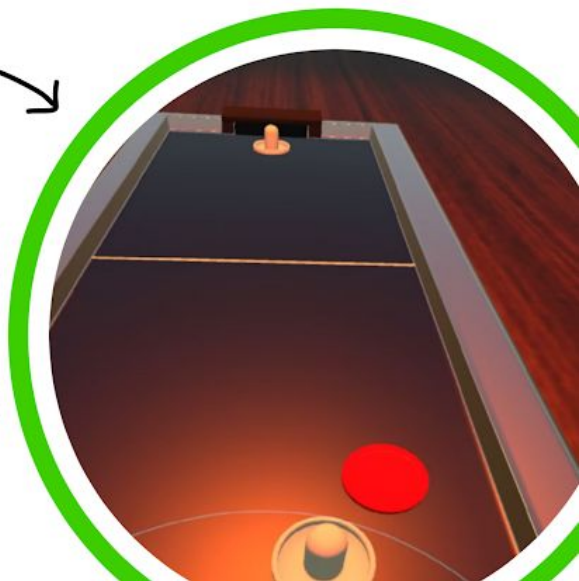
THE LIBRARY

Currently in progress, I am working on a playable **room-scale experience** showcasing TrueMotion's VR **wearable version** capabilities. Players are immersed in a magical library and can **interact with flying books** around them while trying to put them back on their shelves with **magical powers**.



AIR HOCKEY VR

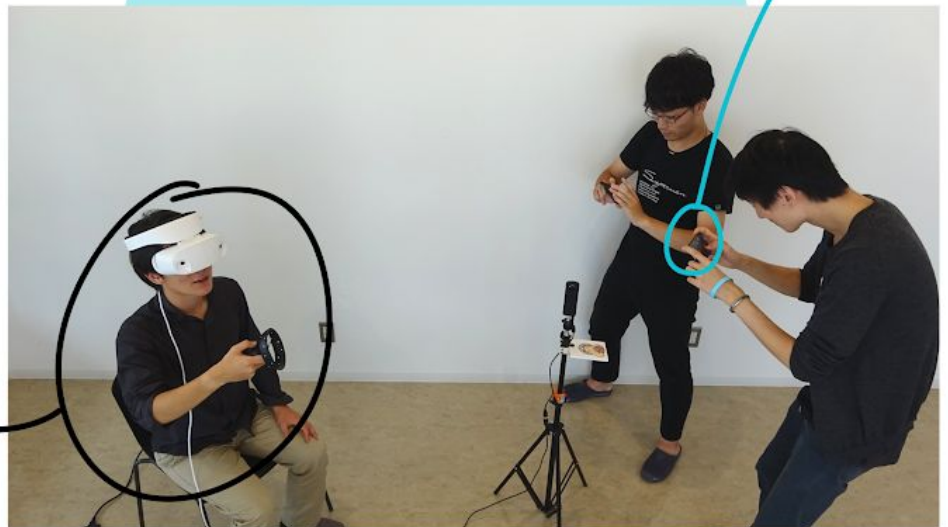
To present the capabilities of TrueMotion's **desktop mode**, I developed a game where a display-using player confronts a VR user. Air hockey was chosen because of my fondness for arcades and its ability to demonstrate **gaze-independent inputs** and **rapid gestures**.



Tabletop ARietty

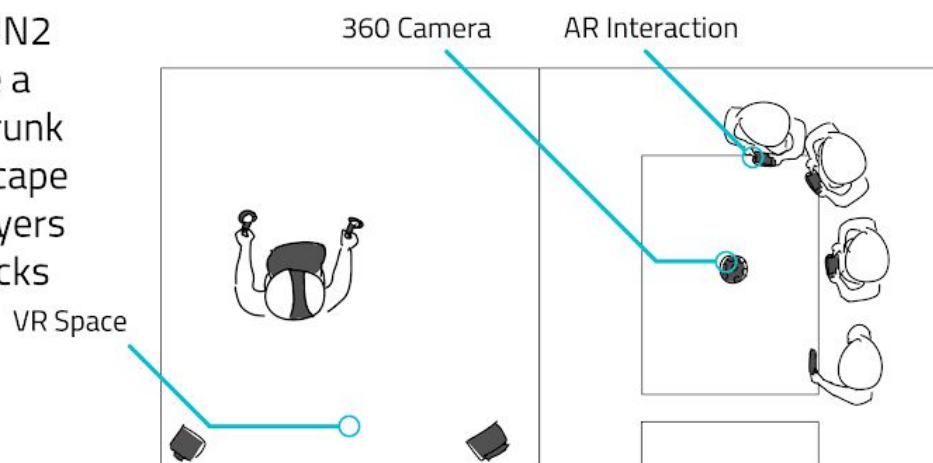
A competitive game between multiple giant AR users and a VR player, whose body is shrunk !

Contest entry qualified for IVRC 2019 Finals, Tokyo, Japan
Won 4th place during preliminary round



I am working on the VR-side, implementing **gameplay mechanics**, and writing **shaders** for one of our entries to the **International collegiate Virtual Reality Contest** in Japan. Live feed from a 360 camera is used as texture, rescaled, and rendered in VR to make nearby players appear as giants ! (More at https://vrc.jp/2019/09/14/ivrc-2019/#4Tabletop_ARietty).

We are using Unity, ARKit 2, and PUN2 among other technologies to create a tabletop **virtual stage** in which a shrunk VR user has to gather items and escape while being targeted at by giant players using smartphones to perform attacks (projectiles, traps, etc).



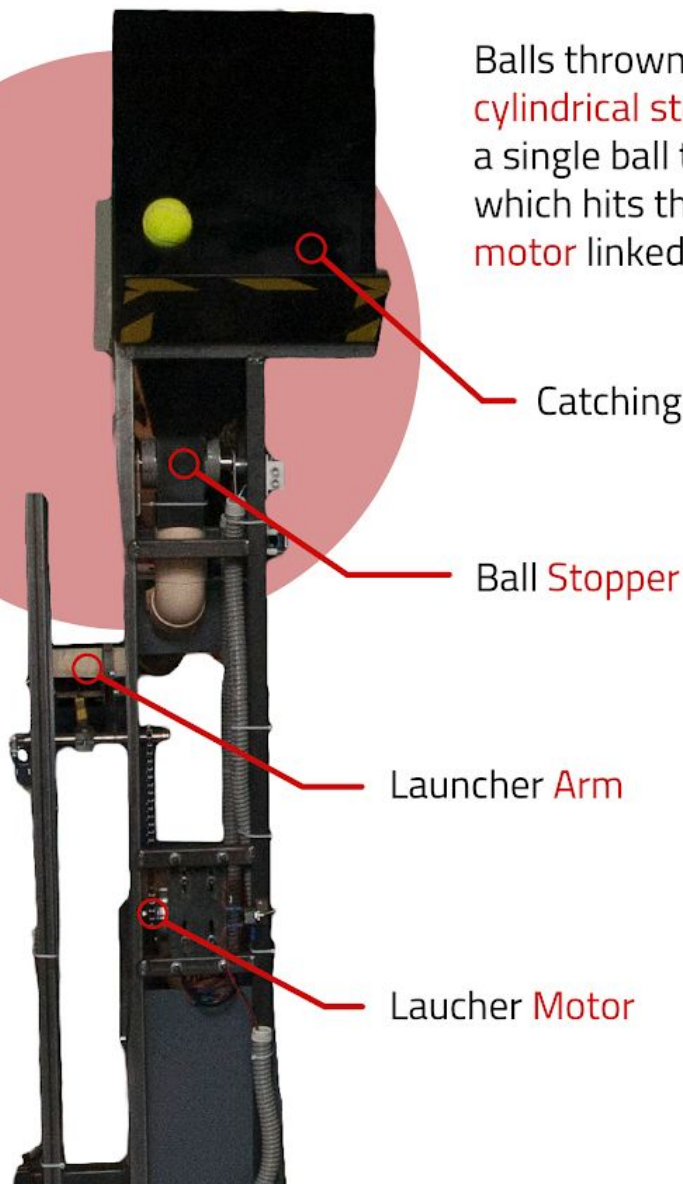
Juggling Robot

A robotised juggling partner designed and built from the ground up.

Yearly industrial project at INSA de Lyon, France



Users can throw balls at the robot at any timing while juggling and receive one by **voice** or **gestural command**.



Balls thrown inside a **funnel** end up stacking on top of a **cylindrical stopper** which rotates on command to only let a single ball through. A tube then directs the ball to an **arm** which hits the ball by rotating at high speed thanks to a **motor** linked to it by a bicycle chain.



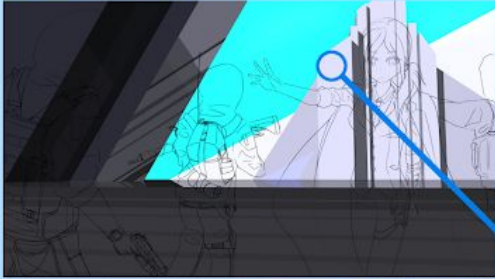
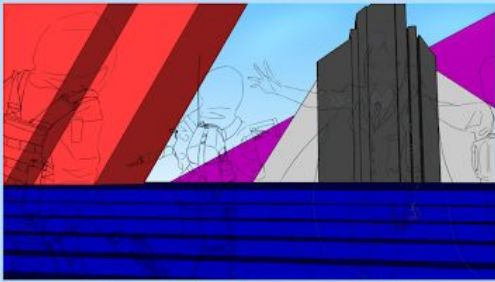
Hobby Projects

I like to make art and tell stories to share with others, and dedicate my free time to that purpose.

Personal game dev & illustration works

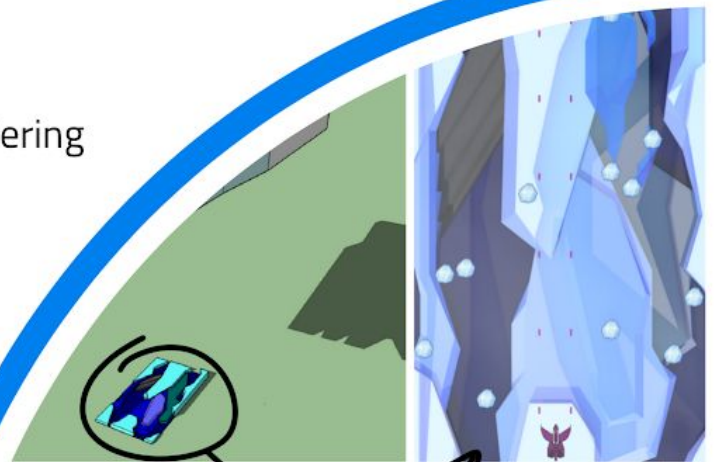


For illustration works, I use mainly two techniques to create **backgrounds** : 3D scene paint-over (**left**) or texture painting (**top**).



3D Scene Rendering

Paint-Over



I also use 3D modeling and art to create my own assets for **game development**.