Augmented Reality Shooting Gaming: Gestural Interface

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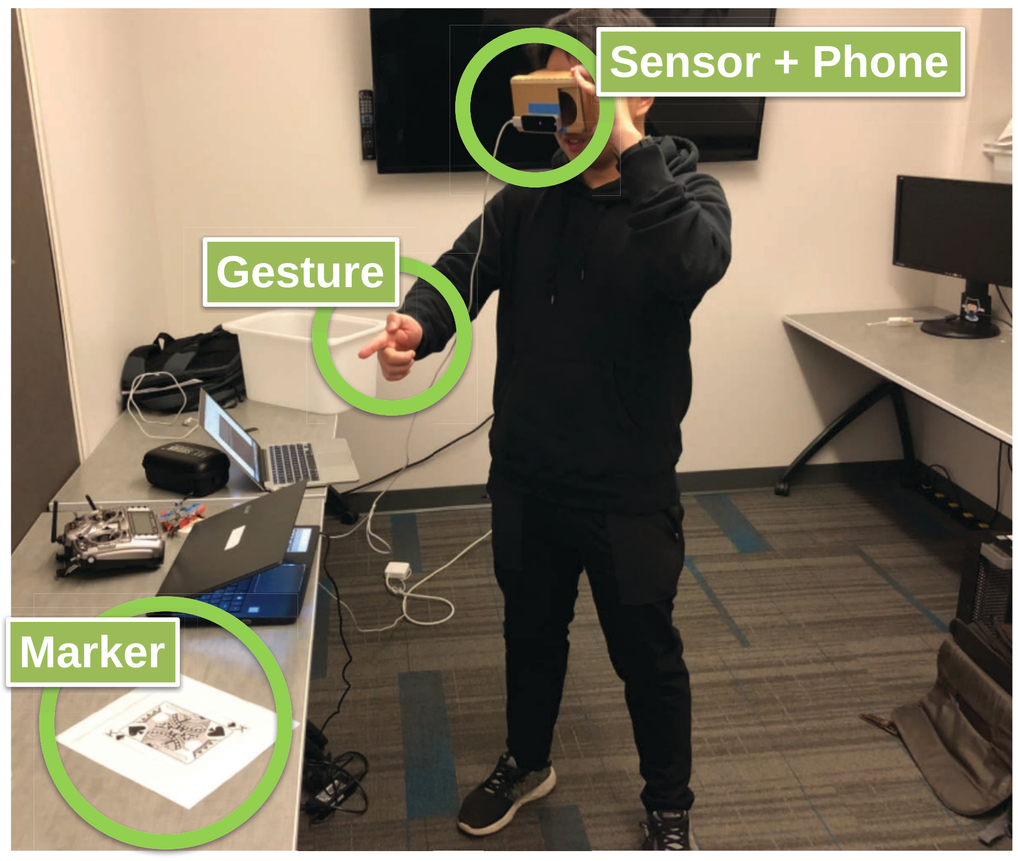
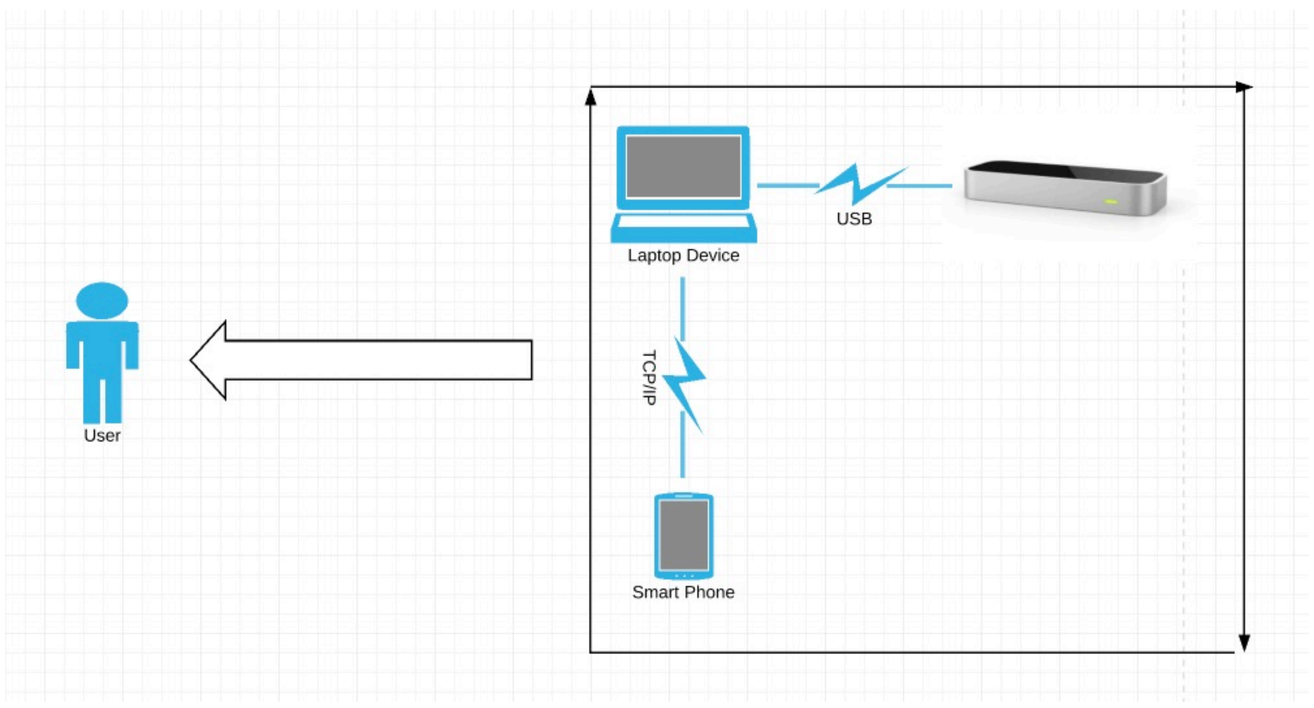
Introduction

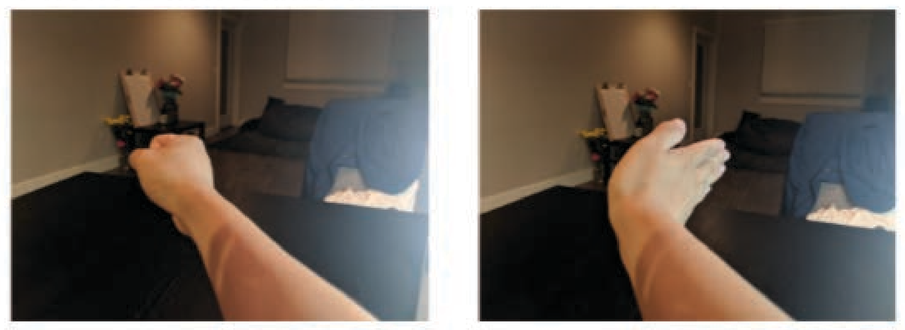
Augmented reality / mixed reality is an emerging technology that may revolutionize mobile gaming. The idea of this project is to mix elements of the real world and the user's movements and actions in the real world, along with elements of a virtual world to produce an immersive gaming environment. We implemented an AR game where virtual monsters walk out of a visual marker in a real location. A virtual gun can be displayed, moved and triggered by a user's hand. To do this well will require a reasonably powerful device with cameras, sensors, and displays, along with cloudlets to do the heavy computational steps. We finally settled down with a lightweight setup using only Leap Motion sensor, Google Cardboard.



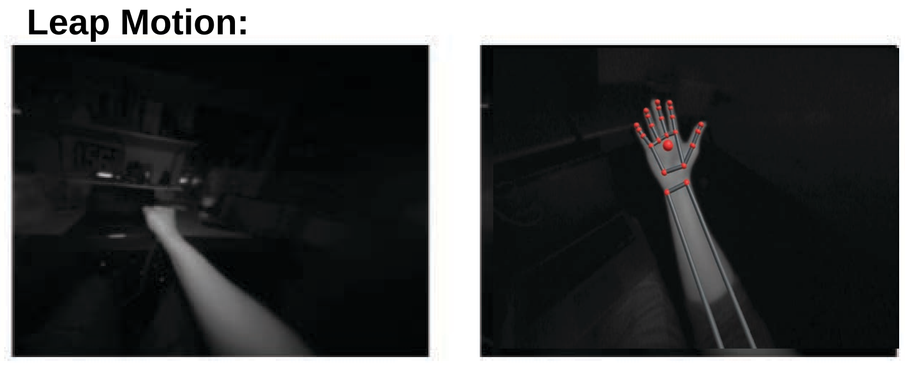
System Architecture



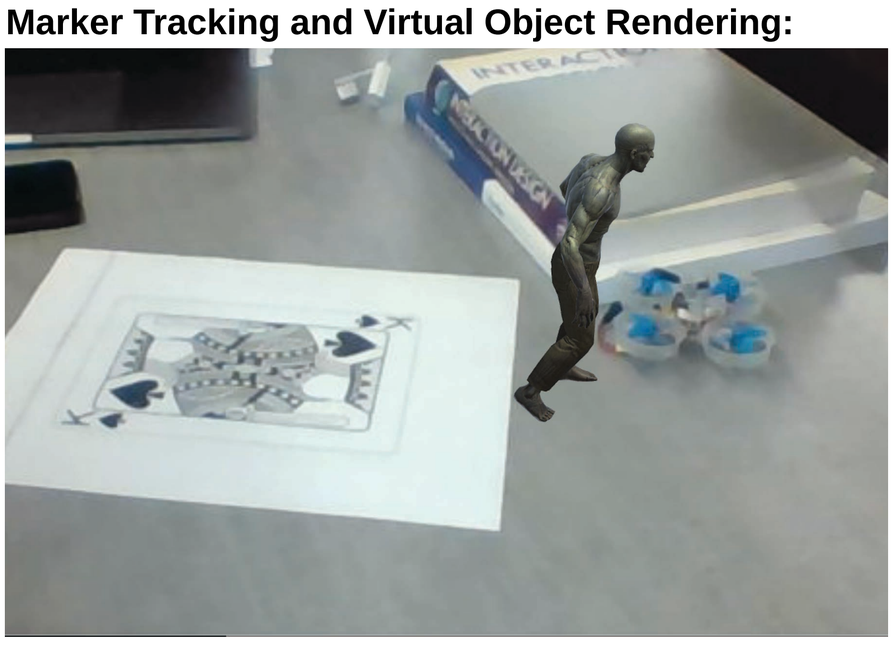
Phone Back Camera:



Leap Motion:

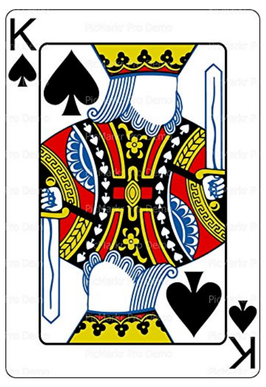


Marker Tracking and Virtual Object Rendering:



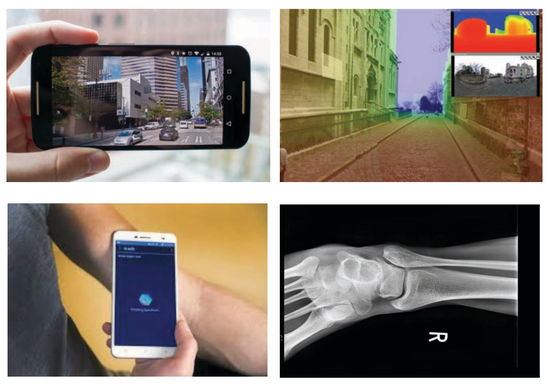
Implementation

- Leap Motion
- Hand Pose Detection
- TCP/IP
- AR marker detection
- Sensor to AR calibration

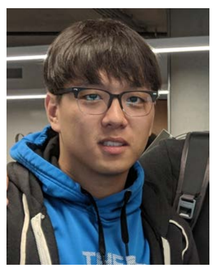


Cloudlet + Rich Sensing Capabilities

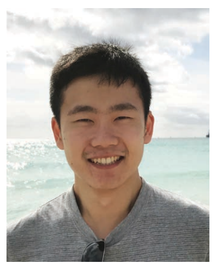
- LIDAR
- Ultrasonic imaging
- ToF depth camera
- X-Ray
- fNIR imaging
- Bio sensing



Team Members



Tan Li is a Master student in School of Computer Science, Carnegie Mellon University. His research interesting is in Edge Computing, Computer Vision and Machine Learning.



Yang Zhang is a PhD student in School of Computer Science, Carnegie Mellon University. His research interest is combining sensing technology and machine learning to make interfaces more fluid and efficient.