CSE 190: Virtual Reality Technologies

LECTURE #10: LOW-END HMDS

Announcements

Homework project 3

- Due Friday, May 18th at 2pm
  - To be demonstrated in VR lab B210
  - Upload code to Ted by 2pm

Low-End HMDs

Google Cardboard

Requires smart phone

Compatible with Android and iOS

Built-in magnet button

- Uses magnetometer

Inexpensive: <$10

Gear VR

Requires Galaxy Note 5, S5-9
- Depends on exact version of Gear VR HMD

Field of view: 96 degrees

HMD has built-in Accelerometer, Gyroscope, Compass

Low photon latency <20ms

60 Hz screen update rate

AMOLED display

Resolution: 2560x1440

Oculus helped optimize Samsung graphics driver

Carl Zeiss VR One

Compatible with iPhone 6, Samsung Galaxy S4, S5, S6, Nexus 5, and LG-G3

High quality lenses

See-through front cover for AR applications

Issues Today

PC-based VR:

- Too many cables: HMDs need to become wireless
- Drivers: most Windows only, few Mac OS, no Linux
- Camera calibration cumbersome

Smart phone VR:

- Most apps only have orientation tracking
  - Position tracking possible with Apple's ARKit and Google's ARCore, but not yet widely used
- Hand held controllers not standardized and not supported by many apps

Both:

- More powerful graphics units needed for more realism
- HMDs don't allow view of environment
- AR coming but not as mature as VR HMDs