

Virtual Reality 1

Dongho Kang, Jaeyoung Lim, Soomin Lee, Jaeryeong Choi

¹kangd@ethz.ch

1. Chapter 1: Introduction into Virtual Reality

1.1. Formation of Virtual Reality

The concept of VR

- capture things and thoughts which elude human
 - painting and stone sculpture (e.g. painting on the walls of cave)
 - complex physical models (e.g. Newton's Law)
- capture (copy) the reality & portray the reality for the purpose of a better understanding

VR before computer

- The first projector : Laternae Magicae (17c) **Figure 1.2, page 1-2**
 - optical system. a picture painted on a glass sheet and illuminated from behind with a candle
 - monoscopic
- Mirror-based stereoscope (C. Wheatstone, 1832) **Figure 1.3, page 1-2**
 - user can gain the impression of depth
 - very limited field of view
- Panorama (R. Baker, 1787) **Figure 1.4, page 1-3**
 - building (built at Leicester Square in London)
 - wider image than stereoscope: cylindrical images from height 10 ~ 14m, circumference 140m
 - still image (no move)
- Kaiserpanorama (19c) **Figure 1.5, page 1-3**
 - moving panorama image
- Head-Mounted-Display (Heilig & Sutherland, 1960) **Figure 1.6, page 1-4**
 - advances in the human-machine-interface, electronics and graphics hardware
 - the rise of VR in the entertainment industries
- Sensorama Simulator (M. Heilig, 1962) **Figure 1.7, page 1-4**
 - one person arcade game (control of bikes and cars)
 - stereovision / stereo sound / wind / realized scents
 - was not successful in the market
- Waller Gunnery Trainer **Figure 1.8, page 1-5**
 - 5 cameras and 5 projectors
 - used to train soldiers for the air force
- Cinerama **Figure 1.9~11, page 1-6~7**
 - 3 special cameras and 3 projectors (146° wide 55° high) but some problems...

- * stitch problem
- * geometric distortion
- * color temperature differences
- * sync by hand (Theatre engineers)
- * odd orientation of the actors (no eye contact)
- cylindrical shape screen

1.2. The development of the computer

1.3. Definitions

2. Chapter 2

3. Chapter 3

4. Chapter 4