Virtual Realty Starts from Reality

THE CHALLENGES AND COMPLEXITIES WHEN DESIGNING THE CAPTURING SYSTEM
Virtual Reality Starts with Reality

Virtual Reality Definition

Generate realistic images (and sound) that replicate a real environment

or

Immersive, interactive experience generated by a computer
Where VR is used today?

• Consumer market
• Academic researches, education
• Art, film production, entertainment
• Sports, Media
• Industrial installations

… and many more
Where VR is used today?

- Consumer market
- Academic researches, education
- Art, film production, entertainment
- Sports, Media
- Industrial installations

… and many more: NBT – Next Big Thing
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The Essentials

• What is needed?
  • Capture the Reality in 3D,
  • and create/reconstruct it’s model
  • With high resolution, high frame rate multiple viewpoints and synchronous capturing
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Ingredients

• Suitable sensors
  • The more pixels the better (HD at least)
  • At least 30 fps
  • High dynamic range
• Interface to deliver image data to the point of use
• Processing and storage software
• … and much more
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Sensors

High resolution, like:

<table>
<thead>
<tr>
<th>Mfg.</th>
<th>Sensor</th>
<th>Image Size [MB]</th>
<th>Max fps</th>
<th>Data Rate [MB/s]</th>
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Many challenges

- Many sensors, many interfaces, many cables
  - Space
  - Reliability
  - Complexity
- Bandwidth
- Distance
- Processor protocol overheads
## Interface requirements

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### PCIe solution

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USB3 vs PCIe Integration Solution
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PCle Integration Solutions

• Connections
  • Arranging
  • Assembling
  • Maintaining
  • TCO
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USB3 vs PCIe Integration Solution
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Integration solutions

- Aggregation
  - Bandwidth
- Heterogeneous downstream
- Homogeneous upstream
- Fiberoptic support
- TCO
PCle does it all

- Space
  - Smaller connectors, different orientations
- Reliability
  - Maturity
  - Low to no latency
  - Less components
- Cost
  - Standard OTS
  - TCO: Less components and all standard
- Complexity
  - Standard
  - Mature
  - Heterogeneous downstream, homogeneous upstream
- Processor protocol overheads
  - DMA
- Distance
  - Fiber optic Stds. implemented multifold
- Bandwidth
  - Scalable up to 64Gb/s
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PCle does it all

See it live at XIMEA booth 1C51
Thank you for your attention