

IEEE 802.21 MEDIA INDEPENDENT HANDOVER

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Title: **Introduction of VR Industry & IEEE P3333.3 WG**

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Abstract: **This contribution document explains why VR industry receives a lot of attention and why IEEE P3333.3 is required to take the industry to the next level**

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Why Should You Care about VR



New Hardware Revolutionize Content

Content Drive The New Hardware

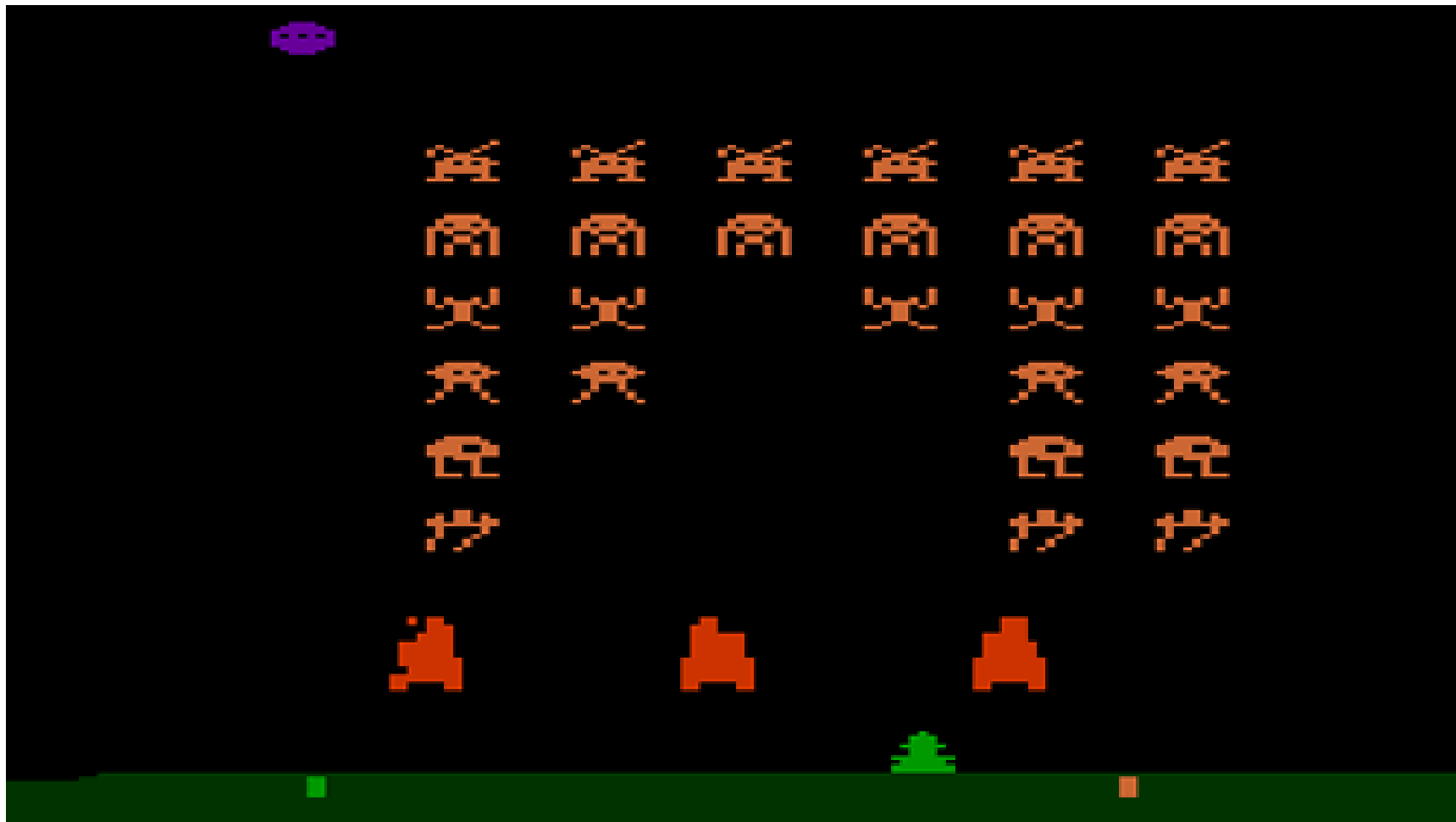
2D

Pixels & Scrolling Sprites

PC & Console – 1977



Atari 2600 – Space Invader (1980)



Apple II – Ultima (1980)



NES (8 BIT) - 1983



NES (8 BIT) - 1985



3D

Texture Mapped Polygons

PC 2.5D – Doom (1993)



PlayStation (32 BIT) - 1994



PlayStation – Tomb Raider (1996)



PC 3D – Quake (1996)



PC 3D GPU – Voodoo (1996)



19 Years Later - 2015



Hardware?



Mobile?

Connecting Billions of People in the World All the Time



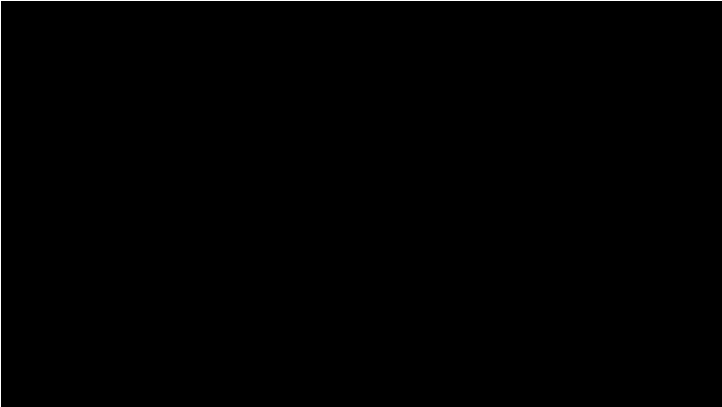


Where Should We Go Then?

VR

Motion Tracking 3D Display

Virtual Reality?



Virtual Reality



Augmented Reality

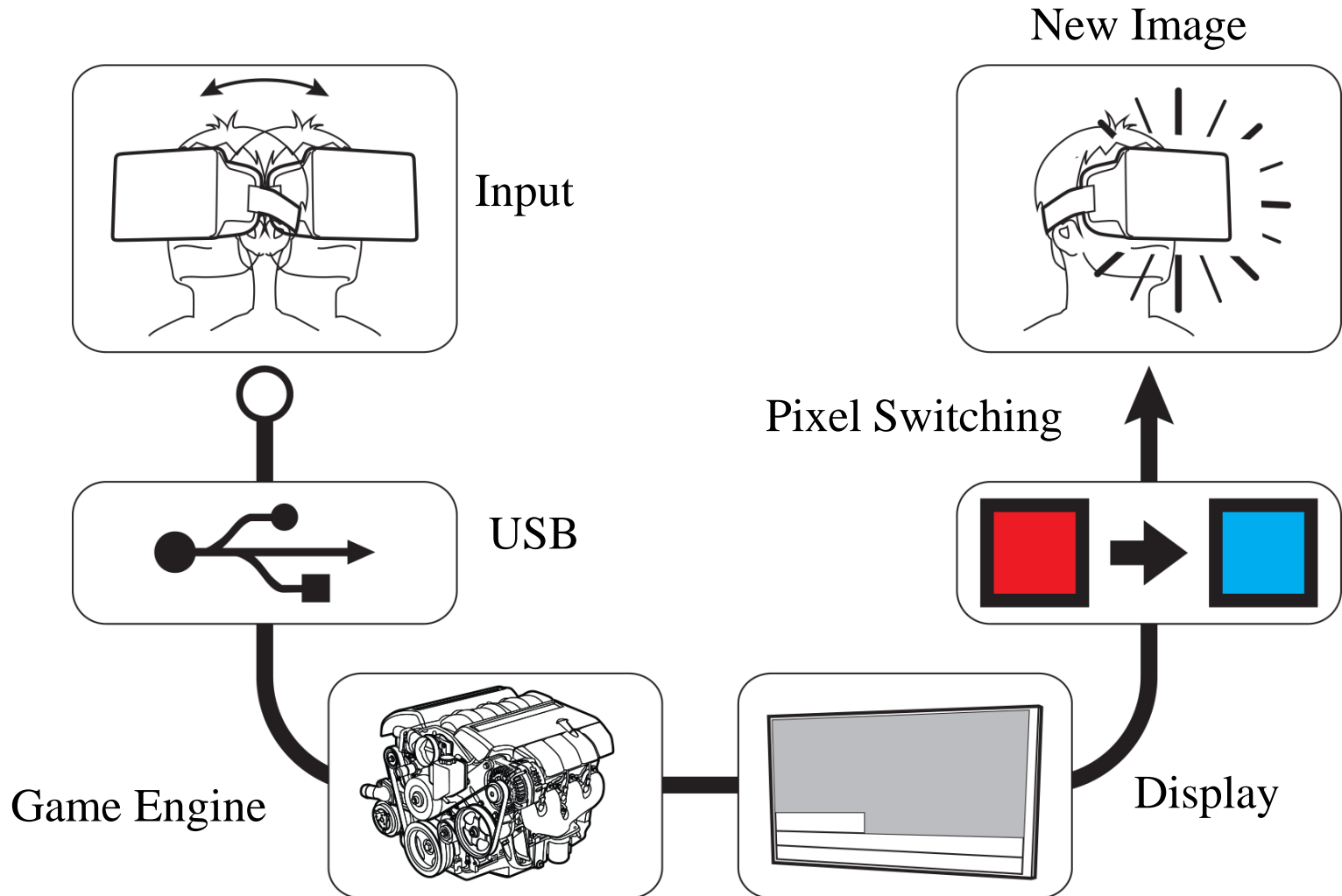
Creating VR Experience

What we want

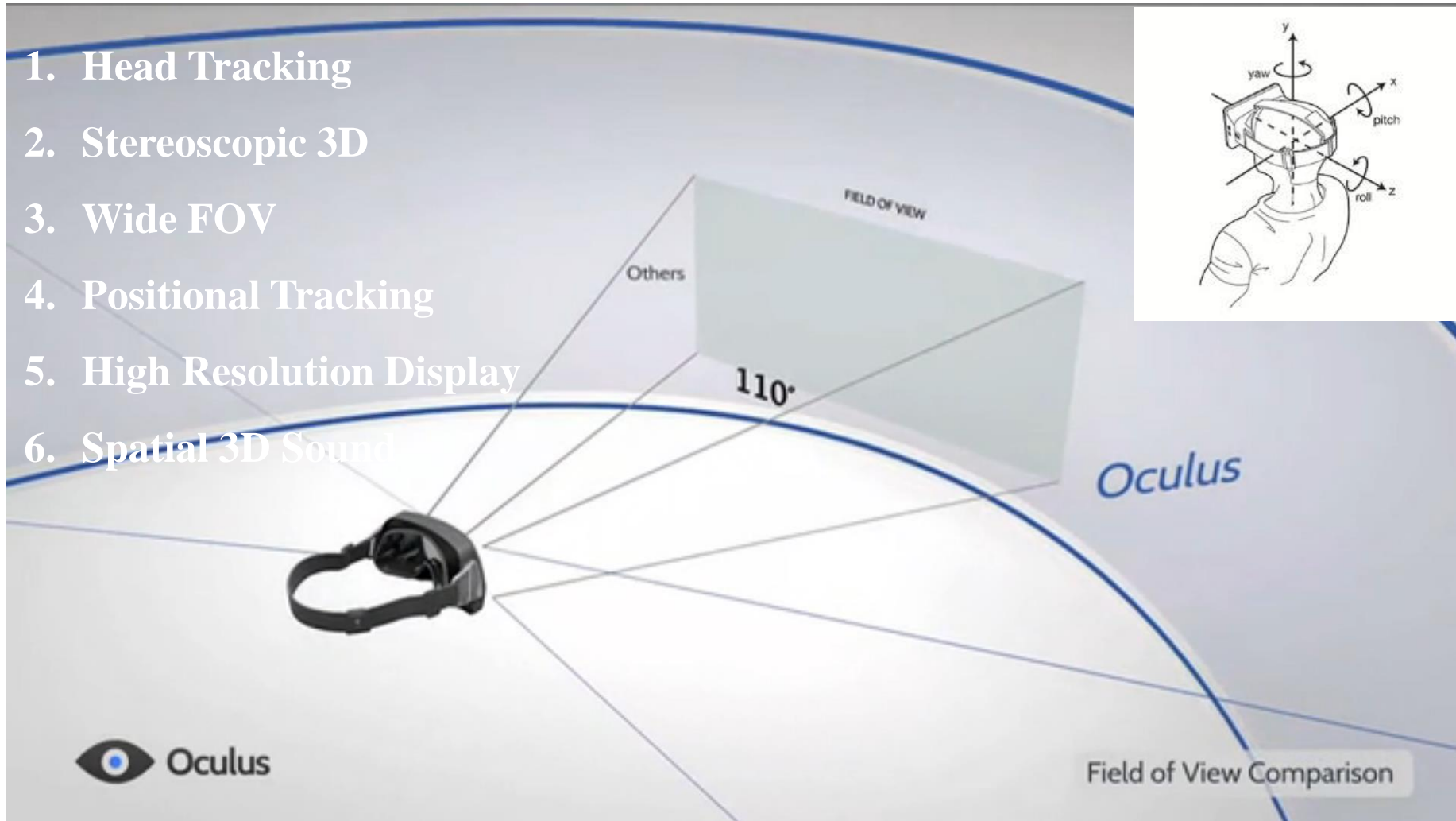
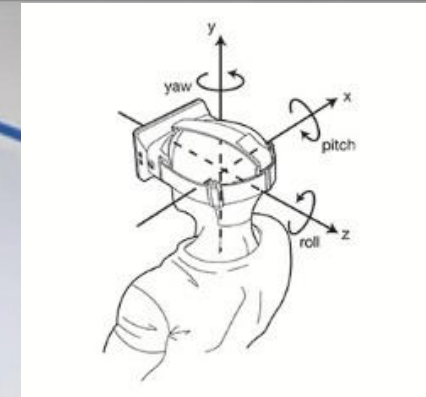
What we get



How HMD Works



1. Head Tracking
2. Stereoscopic 3D
3. Wide FOV
4. Positional Tracking
5. High Resolution Display
6. Spatial 3D Sound



Why Virtual Reality?



New User Experience

Why Virtual Reality?

- Industrial Perspective – Diminishing Return



Why Virtual Reality?

- Industrial Perspective – Diminishing Return



GAMEWORKS VR




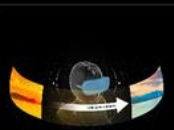

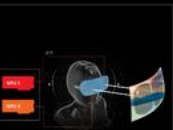

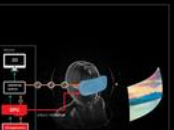
SDK for VR headset and game developers

 <p>MULTIRES SHADING</p> <p>Increase performance via an innovative new way to render for VR.</p>	 <p>VR SLI</p> <p>Scale performance with multiple GPUs.</p>	 <p>CONTEXT PRIORITY</p> <p>Minimize head tracking latency with asynchronous time warp.</p>	 <p>DIRECT MODE</p> <p>Plug and play compatibility from GPU to HMD.</p>	 <p>FRONT BUFFER RENDERING</p> <p>Reduce latency by rendering directly to the front buffer.</p>
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gameworks.vr@amd.com

LiquidVR SDK 1.0 Features

AMD

 <p>Latest data latch</p>  <p>Efficient GPU head tracking</p>	 <p>Asynchronous shaders</p>  <p>Minimizes latency and stuttering</p>	 <p>Affinity multi-GPU</p>  <p>Reduces latency and increases content quality with multiple GPUs.</p>	 <p>Direct-to-display</p>  <p>Delivers a seamless plug & play VR experience.</p>
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LiquidVR

Why Virtual Reality?

- Commercial Perspective – Cost & Efficiency



Be Anywhere



Do Anything



Be Anything



Time



Space



Changes VR Will Bring

IEEE
802

Make your Futures
MyF

Is VR Technology Good Enough?



Biggest Issue



3D Motion Sickness

Known Issues

- Hardware
 - Displays, Lenses, Sensors, Ergonomics, CPUs, GPUs, Batteries, Input Methods & Devices, etc.,
- Software
 - VR Content Design, APIs, Frame Rates, Sound, etc.,
- Infrastructure
 - Wireless, Data Transfer Rates, etc.,
- Medical
 - Eye Constraints, Brain Stimulation, etc.,

Introducing IEEE P3333.3

Working Group designed to study the negative side effects of 3D content people experience when using a VR HMD(Head Mounted Display)

Title

Head Mounted Display (HMD) Based 3D Content Motion Sickness Reducing Technology

Chair

Dongil Dillon Seo (CEO, VoleR Creative / Formerly Oculus Co-founder)

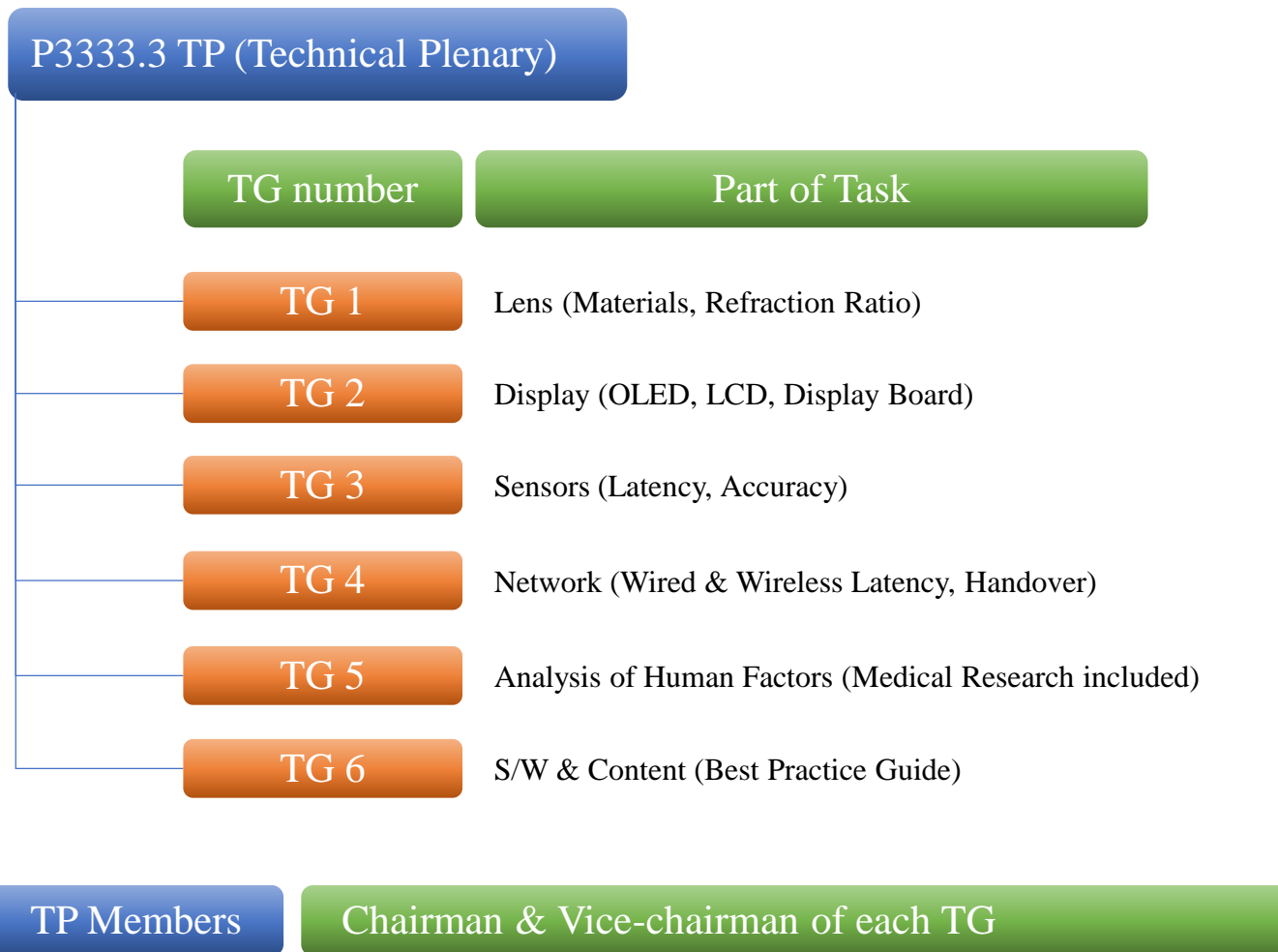
Scope

This group is to establish standards for visual response to:

- the focal distortion
- the lens materials
- the lens refraction ratio; and
- the frame rate (FPS)

by studying the motion sickness caused by the visual mechanism based of VR HMD. This includes not only the hardware and the software involved in the development of HMD but it also includes the study of human factors and network infrastructure supporting the industry.

Structure of IEEE P3333.3



Why should you become a member?

- 1 Technical information exchange with some of the top engineers from the industry
- 2 Royalty revenue from the standards set by one's own work
- 3 Cross-licensing opportunities among the members from different TGs
- 4 Market growth through the stabilization of service
- 5 Establishment of Ecosystem through the stable growth of industry
- 6 Synergy expected from the collaboration between the TGs using their own work
- 7 Opportunities to broaden one's professional network through various meetings

IEEE P3333.3 grants a voting right to an individual participating in this group, but the individual will be representing his/her own affiliates. More participants from different affiliates will create a greater synergy among the TGs.

The background is a solid blue color with several white, curved, wavy lines that sweep across the frame from the top left towards the bottom right, creating a sense of motion and depth.

Thank You