NVIDIA and The Emergence of the Virtual World – Exploring The Omniverse, Digital Twins, and Cloud XR

Presented by
Paul Graham, Peter Wilsher, and Joshua Short

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WE ARE AI

Boston Limited – Who Are We?

- We are an IT Systems Provider and Integrator, established in 1992
- Some areas we cover:

- Partnered with many leading technology vendors, including NVIDIA

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CLOUDXR

Peter Wilsher
Field Application Engineer, Boston Ltd.

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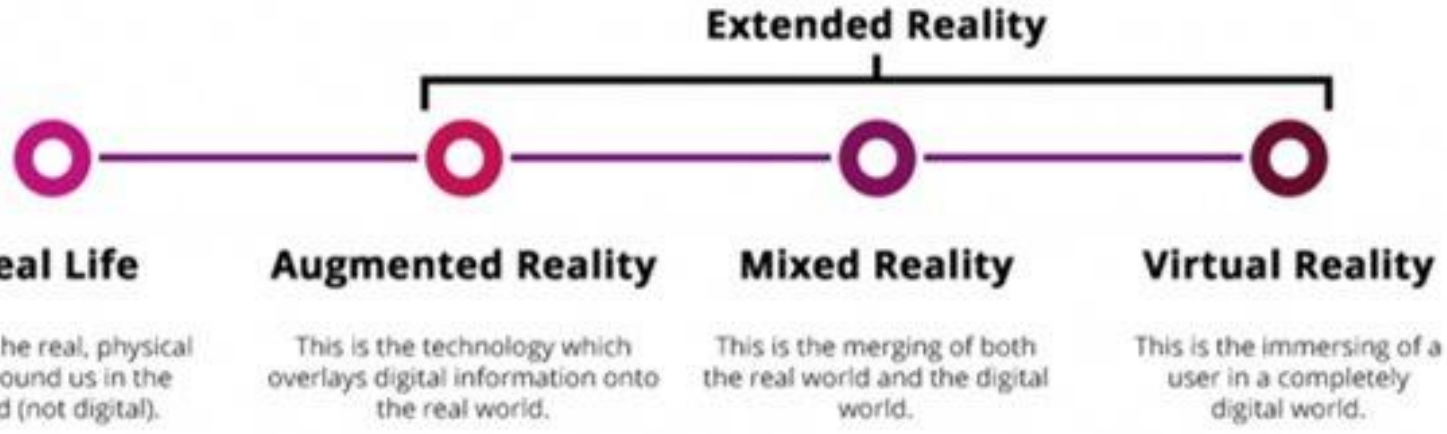
XR – A BRIEF INTRODUCTION

What is eXtended Reality (XR)?

XR is an umbrella term for all the immersive technologies.



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XR PLATFORMS

MOBILE

Low cost

Smartphones, widely available

Easy to handle, maximum freedom

Low to mid graphical experience

ALL IN ONE

Low to mid cost

VR headset without a PC

Built for freedom and XR in mind

Low to mid graphical experience

TETHERED/LOCAL WIRELESS

Highest cost

Reliant on PC system with GPU

Limited movement and use area

Best graphical experience

XR HAS A LOT OF APPLICATIONS IT CAN BE USED FOR

- Simulation
- Training
- Visualisation
- Design
- Entertainment

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ACROSS THE ENTERPRISES TRAINING IS IMPORTANT – XR IS SIGNIFICANTLY BETTER THAN LEGACY METHODS

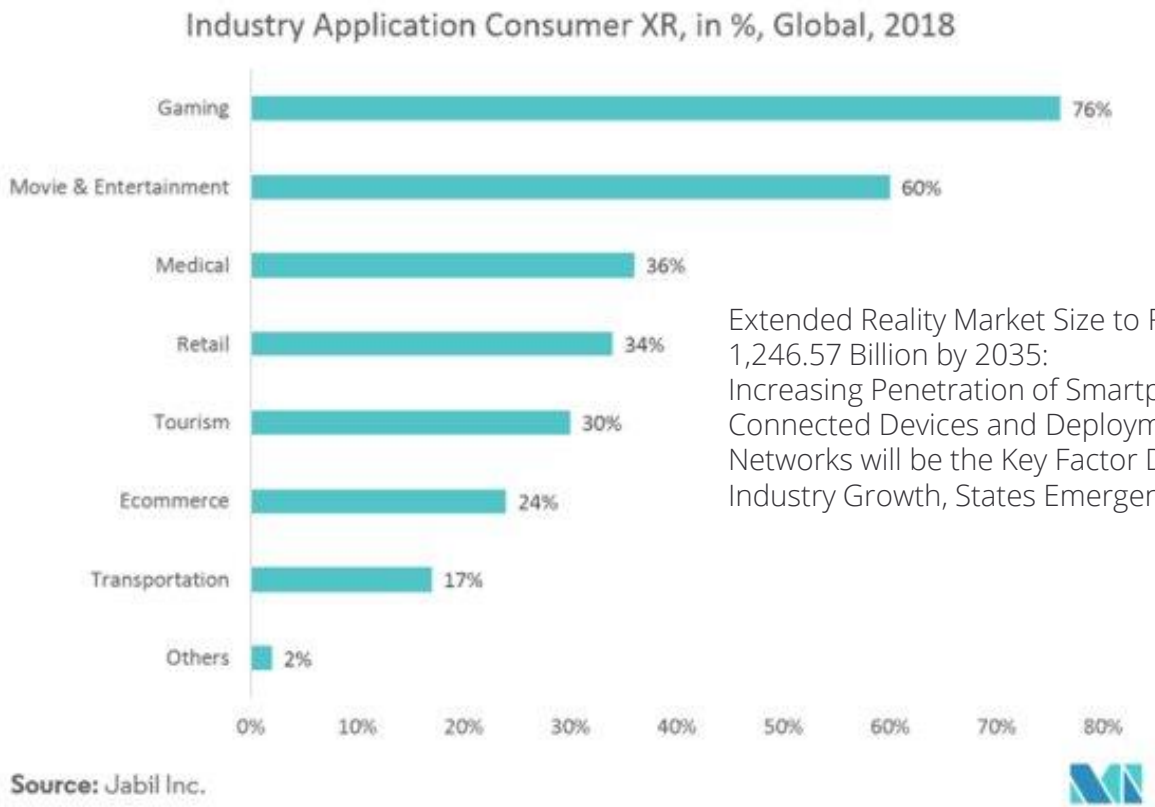
Improved Complex Skill Acquisition by Immersive Virtual Reality Training: A randomised controlled trial

Lohre, Ryan MD; Bois, Aaron J. MD, MSc, FRCSC; Athwal, George S. MD, FRCSC; Goel, Danny P. MD, MSc, FRCSC; on behalf of the Canadian Shoulder and Elbow Society (CSES)*

The Journal of Bone and Joint Surgery: March 18, 2020 - Volume 102 - Issue 6 - p e26

The expert group outperformed the resident group on:
1.) Knowledge testing ($p = 0.04$)
2.) VR group completed the learning activity and knowledge tests significantly faster
3.) The immersive VR group completed the glenoid exposure significantly faster with superior OSATS instrument handling scores ($p = 0.03$)
4.) The immersive VR group scored equivalently in surprise verbal scores and written knowledge scores

ENTERPRISE VIRTUAL REALITY TRAINING SERVICES TO GENERATE US$6.3 BILLION IN 2022



Source: Jabil Inc.

Extended Reality Market Size to Reach USD 1,246.57 Billion by 2035:
Increasing Penetration of Smartphones and Connected Devices and Deployment of 5G Networks will be the Key Factor Driving the Industry Growth, States Emergen Research

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WHAT IS CLOUD XR?

- Allows streaming of XR content over Ethernet, WiFi or 5G
- Flexible to allow different devices to connect
- Gives GPU powered XR experience

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WHY CLOUD XR?

- Seamless streaming from server to client
- Usable by tethered, standalone and mobile devices
- Gives full power of GPU to less powerful devices
- Virtualisation gives more users per GPU
- ALLOWS FOR XR TO BE USED ALMOST ANYWHERE!

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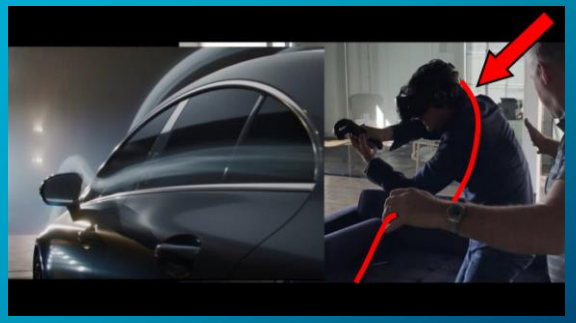
USE CASES

PRODUCT DESIGN

MEDIA & ENTERTAINMENT



VIRTUAL PRODUCTION

COLLABORATION AND TETHERS

Limiting Collaborative Workflows

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1ST GENERATION – THE MU-VR

- Our previous solution – MU-VR
- Allowed 4 users to simultaneously use VR in the same environment

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OUR SOLUTION – MU-CXR

- Multi-User XR Turnkey Solution
- Dual AMD EPYC Processors
- Up to 8TB DDR-4 ECC RAM
- 24 high-capacity SATA drive bays (with option for NVMes)
- 8 x double width GPU slots

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STREAM ALMOST ANYWHERE WITH SIMPLIFIED MANAGEMENT

- Centralised management
- Master software images
- Security and visibility
- Enterprise virtualisation toolset
- Be able to stream content from a datacentre straight to client

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HEADSET COMPARISON – EPIC ROLLER COASTERS

OnePlus 7T Pro

- Pixels – 3120 x 1440
- Refresh rate – 90Hz
- Processor – Qualcomm Snapdragon 855+
- Memory – 8GB
- Graphics – Adreno 640 running at 585 -675MHz

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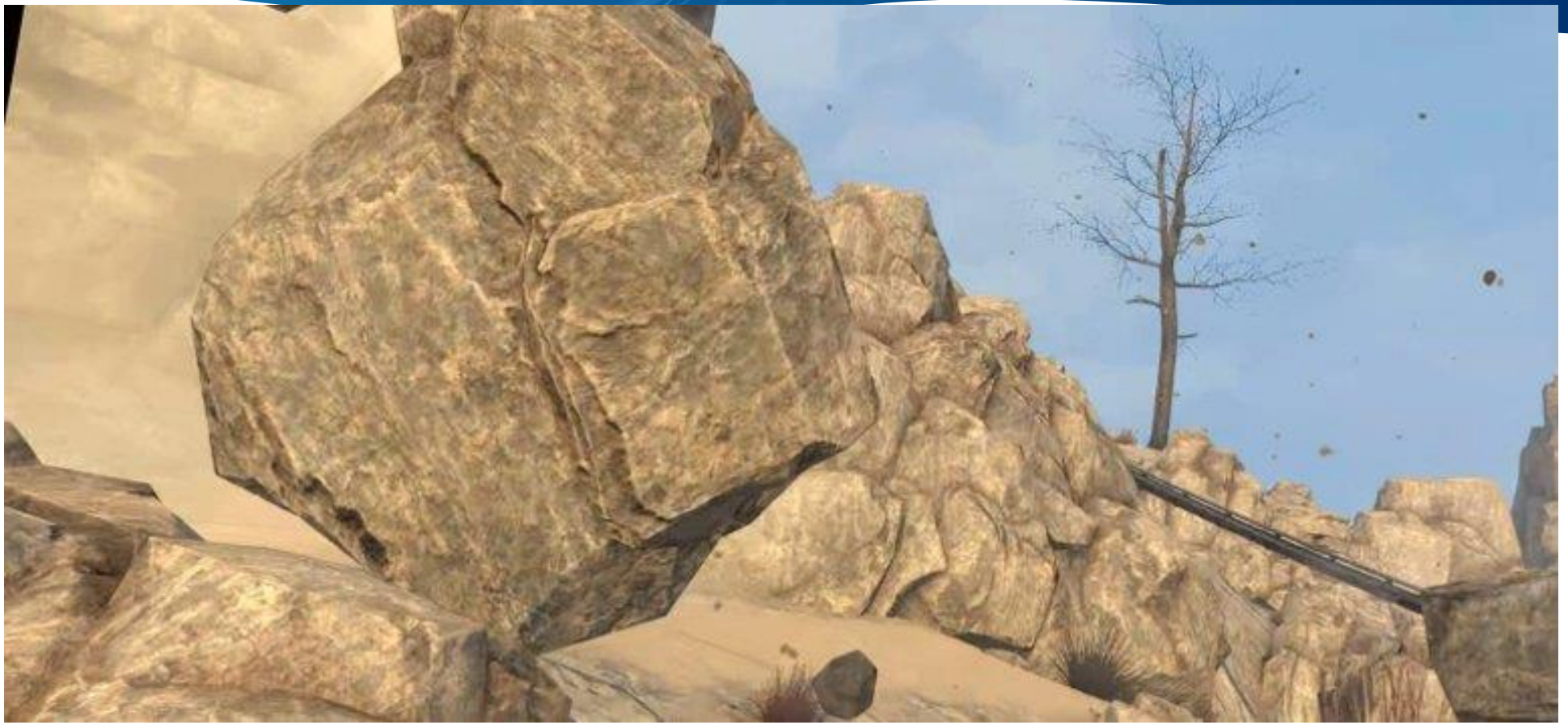
OnePlus 7T PRO CLOUDXR (RTX 6000)



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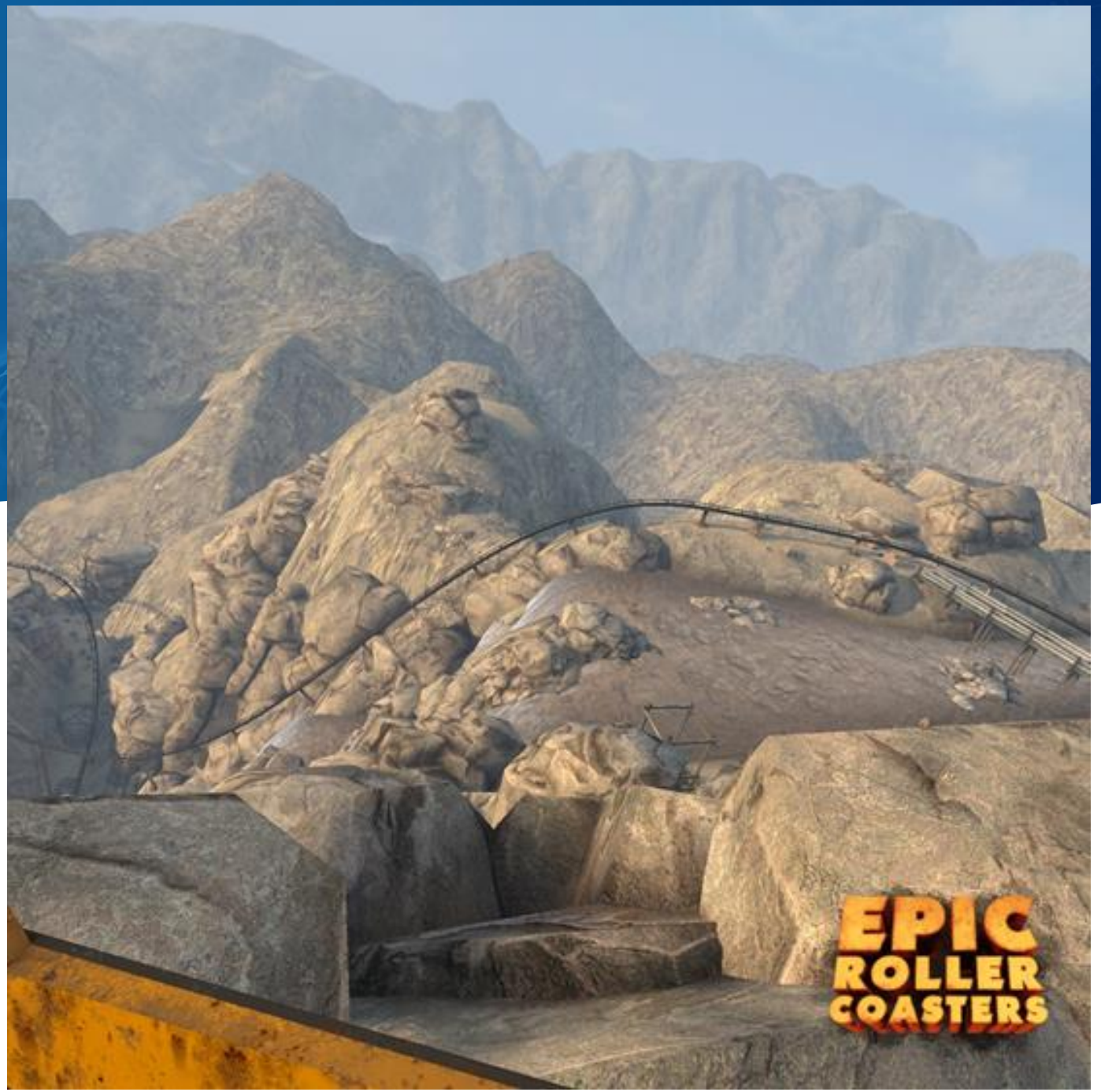
OCULUS QUEST 2

- Pixels per eye – 1832 x 1920
- Refresh rate – up to 120Hz
- Processor – Qualcomm Snapdragon XR2
- Memory – 6GB
- Graphics – Adreno 650 running at 587-670MHz



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OCULUS QUEST 2 CLOUDXR (RTX 6000)

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HTC VIVE

- Processor – AMD EPYC 7281
- Memory – 64 GB
- Graphics – NVIDIA 1080Ti 11GB

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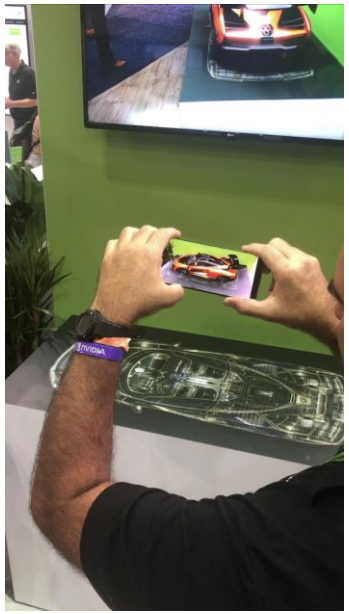
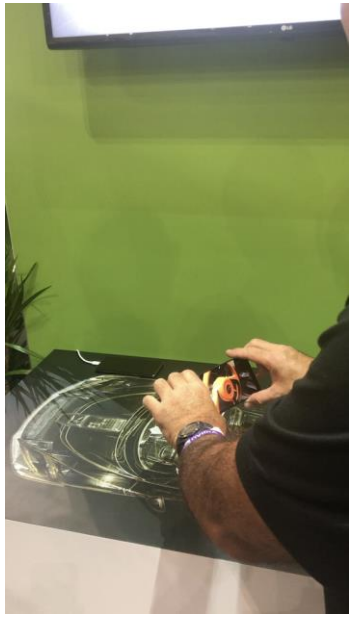
CLOUDXR (RTX 6000)

RTX INTERACTIVE GRAPHICS ON MOBILE DEVICES

Photoreal and Immersive Using Edge Compute





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DELIVERING A STABLE USER EXPERIENCE

- Strong WiFi, Ethernet or 5G connection
- Up to 2 users per GPU for Stand Alone Headsets
- Fully validated solution – end to end

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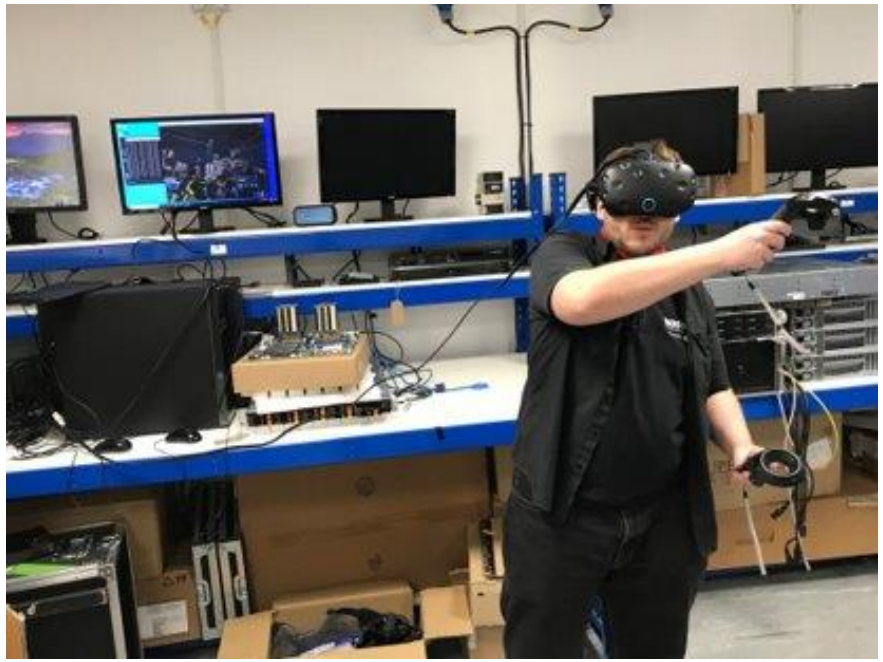
XR IN ACTION



Tethered

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XR IN ACTION

All In One

Even Outside

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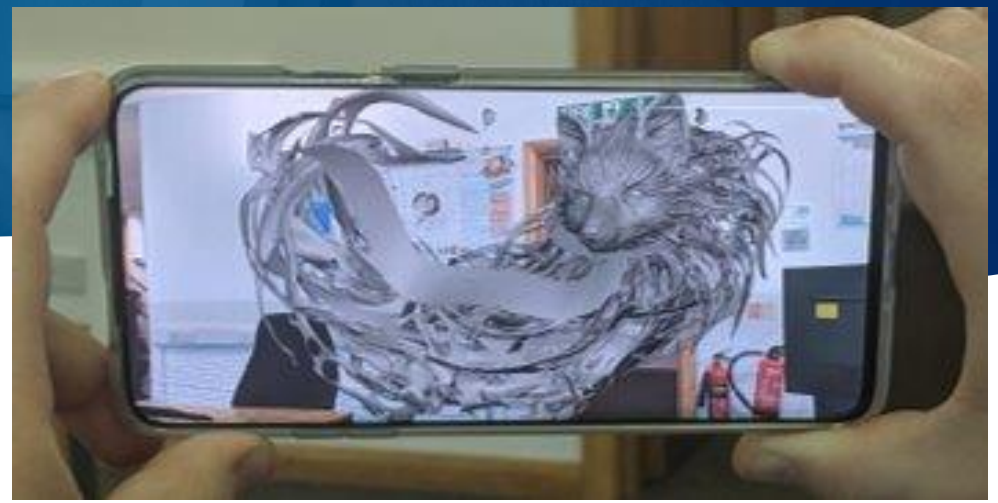
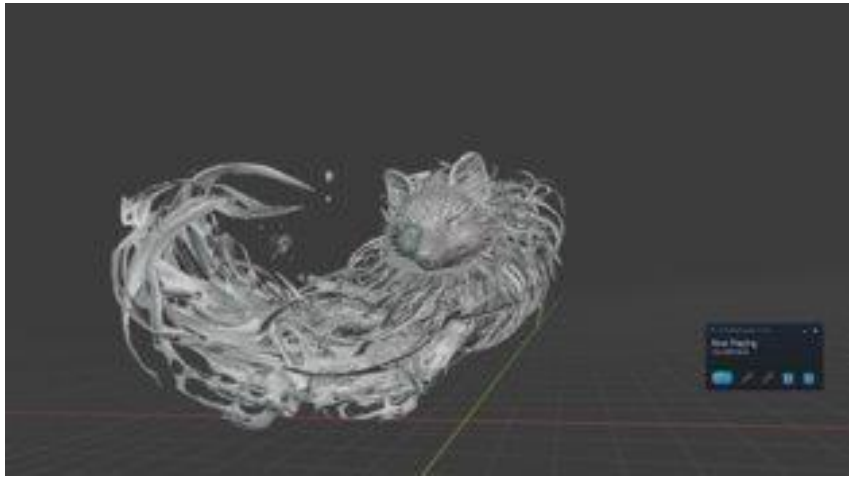
XR IN ACTION



Mobile

Blender Scene in VR



Inspecting the same Blender scene on a hand-held device

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MV-VR - PROCTER AND GAMBLE

3 user VR experience to office in Belgium

Used to deliver uniform and repeatable sales and product training in-house

Fully delivered and installed

Full operator training

Ongoing support and maintenance

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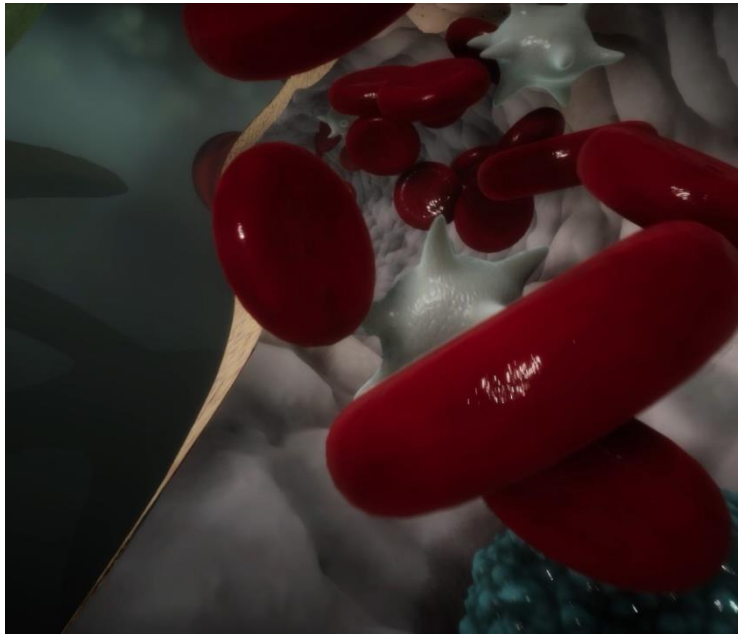
SUCCESS STORY – COVENTRY UNI

The Grid Factory, Vodafone pair 5G and CloudXR for virtual lessons on the human body:

- Brings the inside of the human body to 3D
- Tutors can use tech without any setup
- Guided students on interactive explorations of the human body in 3D models
- Showed a virus attack on human body (rendered in real time)



THANKS
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