The New VR
From Entertainment to Education
The New VR

From Entertainment to Education
What is VR?
VR : Virtual Reality

An artificial environment which is experienced through sensory stimuli (such as sights and sounds) provided by a computer and in which one's actions partially determine what happens in the environment.

Microsoft MR  Oculus Go  Vive Pro  Santa Cruz
DOF: Degrees of Freedom

3 DOF: Orientation: Pitch, Yaw, Roll

6 DOF: Position: X Y Z
Head.Hands: Controls

3.3 DOF: Head Orientation and one hand pointing

6.6 DOF: Position and orientation for head and both hands

Google Daydream

Oculus Rift
Tracking

The means by which the Degrees of Freedom are sensed, calculated and sent to the computer.
Tracking

The means by which the Degrees of Freedom are sensed, calculated and sent to the computer.
Wired vs. Wireless

Whether or not you need to have wires running out of the headset into a computing device.
VR Headsets

3 DOF Wireless
- Samsung Gear VR
- Facebook’s Oculus Go
- Google Daydream
- Valve’s Vive Focus

6 DOF Wired
- Sony Playstation VR
- Facebook’s Oculus Rift
- Microsoft MR
- Valve’s HTC Vive
The Future...

6 DOF Wireless

- HTC Vive with casting
- Oculus Santa Cruz
...is Expensive or not here...

- 6 DOF Wireless
  - HTC Vive with casting
  - Oculus Santa Cruz

$800 + Computer ($1000)

???
AR : Augmented Reality

An enhanced version of reality created by the use of technology to overlay digital information on an image of something being viewed through a device (such as a smartphone camera).

ARKit is iOS
ARCore is Android

HoloLens
Phone
Glass EE
Magic Leap
Intel Vaunt
AR : Augmented Reality

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HoloLens  Phone  Glass EE  Magic Leap  Intel Vaunt
I think smart glasses are really going to take off. They'll probably replace phones some day, who wants to carry a phone around anyway!

You're crazy, who wants to wear glasses!
Future Bet of 2015

If, in the year 2030, more smart glasses are sold than smartphones, Jason will buy Shawn a top of the line pair of smart glasses. If not, Shawn will buy Jason a top of the line smartphone.
INTEL MADE SMART GLASSES THAT LOOK NORMAL

Exclusive first look at Vaunt, which uses retinal projection to put a display in your eyeball

By Dieter Bohn | @backlon |  Feb 5, 2018, 8:00am EST

Intel is giving up on its smart glasses

So long, Vaunt

By Dieter Bohn | @backlon |  Apr 18, 2018, 10:37pm EDT
AR: Augmented Reality

An enhanced version of reality created by the use of technology to overlay digital information on an image of something being viewed through a device (such as a smartphone camera).
The field of view is the extent of the observable world that is seen at any given moment. Humans have ~155 degrees horizontally (~114 bioculuar, ~200 monocular)

110 : Rift, Vive, Microsoft MR
100 : Gear, Daydream, PSVR
90  : “Put your phone in” systems
70  : Microsoft's HoloLens
??  : Magic Leap
What You Need to Know

- Virtual Reality: Replaces what you see with virtual elements
- Augmented Reality: Layers virtual elements over what you see
- 6 DOF > 3 DOF (6.6 is best)
- Inside Out Tracking is best - nothing to set up
- Wireless is best
- Wide FOV is best
- Big Dreams Coming Soon:
  - Santa Cruz: 6.6 Standalone Inside-Out Wireless VR
  - Magic Leap: 6.6 Standalone Inside-Out Wireless AR
1935 - Imagined by sci-fi authors

1968 - VR system created by Ivan Sutherland

1984 - Jaron Lanier - VPL Research “EyePhone”

1990 - “Virtuality” debuts in arcades and the cinema classic Hackers

1995 - Nintendo’s Virtual Boy

1998 - DisneyQuest VR

2007 - 2018 VR BOOM!
2007 - Valve starts coding Vive

2009 - PSVR work begins

2012 - Oculus Kickstarter $2.4 million

2014 - Facebook buys Oculus for $2 billion

2015 - Samsung Gear VR

2016 - Vive, Oculus, PSVR, & Daydream!!

2017 - Microsoft MR

2018 - Vive Focus

Lenovo Mirage

Santa Cruz??

First VRDC!!
CORONER REPORT
CERTIFICATE OF DEATH

DECEASED

CAUSE OF DEATH
LASER BLAST

HOLE

Head Brain was destroyed
Back The back no longer exist.
Location of Body: Body could not be recovered at this time.

Part: ☑ Body ☑ Heart ☑ Wound ☐

Additional Notes We must not quit, Zoraxis must be stopped.
We are sorry for his death at this time, there is nothing left of him after all of that.
Presence
WHAT IS VR BEING USED FOR?

- Entertainment
  - Movie & TV watching
  - ~2700 Vive games / experiences
  - ~2000 Oculus games / experiences
  - ~200 PSVR games
WHAT IS VR BEING USED FOR?

● Location Based Entertainment
  ○ VR roller coasters
  ○ IMAX VR
  ○ The Void
WHAT IS VR BEING USED FOR?

● Live Sports and Events
  ○ LiveLikeVR.com
  ○ YouVisit.com
  ○ Wemersive.com
  ○ 360VirtualTours.co.uk
  ○ Olympics!
WHAT IS VR BEING USED FOR?

• Mapping
  ○ Google Earth
  ○ Google Expeditions
WHAT IS VR BEING USED FOR?

- Creating Art:
  Tiltbrush, Quill, Sketchfab, Paint VR, Blocks, Medium
WHAT IS VR BEING USED FOR?

● Training
  ○ **Devs:** Simcoach Games (Pittsburgh), Strivr, Sentient Computing, VirTra, Google, Virtual Theraputics, ZeroLight, Deloitte Digital
  ○ **Clients:** NFL, Walmart, UPS, Police, Military, Hospitals, Factory Workers, HR Departments, Trucking, and KFC
Schell Games

- History of Transformational games
- Bring knowledge of creating immersive experiences that support presence to education
Schell Games

- The Transformational Framework
- HoloLAB Champions (Virtual Lab practice. Real Lab Mastery.)

(with grant from Institute of Education Sciences)
Deloitte Digital

- Joint venture between Deloitte and Linde North America
- Train drivers and operators of hazardous chemical trucks
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“I love your game, by the way! It’s definitely one of my favorites and it has been a really good reference point for me for VR design.”

-Josiah Hunt
Deloitte Digital - Details

- Pilot stage
- New drivers train in VR prior to real truck
- Sim available for periodic practice
- Mentor shadowing is basis of existing training, VR makes it more flexible: trainees can do procedures real customers don’t often need; even multiple times to help with learning retention
- Tested with range of drivers from 30’s to 50s
- Drivers acclimated more quickly to VR than traditional keyboard and mouse equipment sims
- Time to readiness is proving to be a third of traditional training
SimCoach Games

- Skill Arcade: Attract Diverse, Pre-Qualified, Applicants Through Video Games
  - Harness Hero
  - Site Coach: Start Smart
“We started with one VR headset in one Walmart Academy, with a single-use case: We placed an associate in a virtual store environment and asked her to look for potential problems such as litter on the floor, a spill, or a sign hanging incorrectly. The other trainees observed, in real time, the associate’s interaction with the environment on screens in the classroom. The trainees were fully engaged in the experience, able to clearly visualize the surroundings and the corresponding behaviors. It worked so well that we’re now expanding VR-based training and a wide variety of use cases to all 200 academy locations.”

-Judith McKenna, Exec. VP & COO Walmart US
Virtual Therapeutics

- Creating VR experiences to help patients with therapies.
Virtual Therapeutics

- Certain conditions require techniques like resonant breathing and mental exercises
- Patients perform these while hooked up to a biometric machine for feedback, but it’s not interesting
- Now they can enter a virtual world, a game experience where they can use the stress management techniques to explore a fantastical world, help characters, and solve problems
- This leads to better retention and, hopefully, they will be better prepared to apply them in stressful situations in real life
ZeroLight

- Sales Training
- Consumer Virtual Showrooms
- Both AR & VR Experiences
Vantage Point

- Leverages VR for education and training around sexual assault
- Places users in the same room as a survivor
- Helps teach techniques such as bystander intervention.
- Increased employee retention - over 90% of the training material
Google Glass EE & AGCO

- Proceedix made suite of tools for Glass EE for AGCO
- Glass used with training reduces time taken to a third
- Employees can access training videos, images annotated with instructions, or quality assurance checklists
- Glass EE brings supervisors into the work environment
- 30 percent reduction in processing times
- 50 percent reduction in new hire and cross functional employee training time
Accumulated Tips

- Make environments as realistic as possible
- Stay away from teleporting if at all possible
- Provide after training tools to analyze performance
- Keep interactions short, allowing quick replay
- Make experience convenient and accessible
- Create meaningful interactions - helps retention
- Keep feedback very focused
- Let player control the flow
- Doing is learning
Ways to Measure Results

- Run academic studies on change in attitude and/or knowledge (pre/post)
- Compare locations that use a game intervention vs. similar locations within the same company that don't
- Collect before/after data on key metrics
- Collect data on total usage of app or experience
- Provide all data to partners
- Collect feedback from clients/partners and players
What’s the catch?
Cons of VR/AR Training

- New Technology
- Harder Development
Considerations of VR/AR Training

● New Technology - Embrace it! Use the new Standalone 6.6 DOF VR!

● Harder Development - Plan for it!
  ○ Bigger budget for longer timelines
  ○ Embrace Rapid Iteration
Future of VR/AR Training?

- Proven effective
- Tech is only getting better, cheaper, and more versatile
Thanks!

Questions?

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(I'm serious about the Void, let's go!)