

# Virtual Reality

Perspectives on eSports and more



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**FuturePerfect**  
MACHINE  
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# Market Observations

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- **A lot of people watch other people play games.**
- According to the industry researchers at SuperData, the "**worldwide gaming video content audience**" includes **665 million people**. And it's growing: The company predicts a **21 percent viewer increase** between now and 2021.
- According to SuperData, there's now a **bigger audience** for gaming video **than the combined audiences of HBO, Netflix, ESPN, and Hulu.**
- **By 2019**, you'll be able to don on your **VR headset** and go anywhere on the [baseball] field... and **watch the game** with maybe a two-second delay," **Intel CEO Brian Krzanic**

# eSports: Recent News (as of 08/20/17)

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- **Tony Estanguet**, co-president of the **Paris 2024 Olympic bid committee** said “**We have to look at [eSports] because we can’t say, ‘It’s not us. It’s not about Olympics ... The youth, yes they are interested in eSport and this kind of thing. Let’s look at it.** Let’s meet them. Let’s try if we can find some bridges ... There is some time to look at it, to interact, to engage ... We will spend some time after (the IOC meeting in September) Lima to engage with new people and stakeholders. The IOC will have the last ... say, if they want eSports on the program. Let’s discuss among ourselves.”
- **Telemundo** broadcast all 16 hours of the **FIFA Interactive World Cup** (an annual video gaming competition organized by FIFA and EA Sports) and Peter Blacker, Executive Vice President of digital media and emerging business for NBCUniversal Telemundo Enterprises said “**Esports gives us an opportunity to connect with the Hispanic, multicultural gaming audience** ... Esports consumers tend to be more millennial, and Hispanics are the most engaged in that group ... Our heritage as part of NBCU means we’re the Hispanic home of the Olympics, which have been a great place for us to shine a light on athletes and their journeys, we’re going to do that in the eSports area as well.”
- Market research firm **Nielson** announced a **new eSports business unit** and said, “eSports has experienced massive global growth over the past few years with major investment from blue chip sponsors, game publishers and media companies, as well as sports leagues and teams. The eSports fan base is also rapidly expanding with nearly one in three fans beginning to follow eSports just within the past year.” (Note: Advisory board members include **ESL, ESPN, Facebook, FIFA, Major League Gaming/Activision Blizzard, NBA 2K League, The Next Level, Sony PlayStation, Turner, Twitch, Twitter Unilever** and **Google YouTube**.)

## OUR TAKE

- Given that Olympic viewership has been declining, introducing activities such as eSports may help reverse this trend.
- While eSports is still at a relatively early stage of development, this market will continue to expand and attract many new participants.
- **Advances in geo-spatial technologies (such augmented/virtual reality, sensors, motion capture, robotics/drones, etc.) will result in the introduction of new types of sports competition and reshape both traditional and eSports.**

# eSports on Twitch: A Sampler

Top 25 TwitchTV Users by Followers					View More
RANK	GRADE	USERNAME	LAST GAME	VIEWS	FOLLOWERS
1	A++	<a href="#">syndicate</a>	PLAYERUNKNOWN'S BATTLEGROUNDS	39,503,353	2,450,925
2	A++	<a href="#">riotgames</a>	League of Legends	906,791,114	2,428,572
3	A++	<a href="#">summit1g</a>	Golf It!	162,142,832	2,192,342
4	A++	<a href="#">esl_csgo</a>	Counter-Strike: Global Offensive	249,420,389	2,141,037
5	A++	<a href="#">esl_tv_cs</a>	Counter-Strike: Global Offensive	249,420,389	2,141,037
6	A++	<a href="#">nightblue3</a>	League of Legends	176,257,319	1,974,103
7	A++	<a href="#">imgtpie</a>	League of Legends	223,356,997	1,846,278
8	A++	<a href="#">lirikk</a>	Conan Exiles	192,331,140	1,774,560
9	A++	<a href="#">lirik</a>	Conan Exiles	192,331,140	1,774,560
10	A++	<a href="#">sodapoppin</a>	IRL	165,805,163	1,519,695
11	A++	<a href="#">PhantomLord</a>	League of Legends	88,627,115	1,396,710
12	A++	<a href="#">officialbjergsen</a>	League of Legends	86,258,058	1,349,541
13	A++	<a href="#">wolves_bjergsen</a>	League of Legends	86,258,048	1,349,535
14	A++	<a href="#">tsm_bjergsen</a>	League of Legends	86,258,048	1,349,533
15	A++	<a href="#">joshog</a>	Golf It!	40,540,805	1,327,694
16	A++	<a href="#">theoriginalweed</a>	Golf It!	40,540,747	1,327,692
17	A++	<a href="#">dyrus</a>	League of Legends	195,724,923	1,320,135
18	A++	<a href="#">Tsm_dyrus</a>	League of Legends	195,724,883	1,320,132
19	A++	<a href="#">qosu</a>	League of Legends	92,529,191	1,273,360
20	A++	<a href="#">captainsparklez</a>	Minecraft	20,577,154	1,264,284
21	A++	<a href="#">goldglove</a>	IRL	46,507,627	1,245,275
22	A++	<a href="#">castro_1021</a>	FIFA Street	34,396,164	1,239,300
23	A++	<a href="#">timthetatman</a>	World of Warcraft	52,152,651	1,203,829
24	A++	<a href="#">dreamhackcs</a>	Counter-Strike: Global Offensive	111,601,507	1,170,199
25	A++	<a href="#">boxbox</a>	League of Legends	73,608,734	1,158,312

# Background on Virtual Reality

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# Virtual Reality is not New



**1929:** Edwin Link develops Link Trainer, a mechanical airplane simulator.



**1930s:** View-Master is provided as a mass-produced stereoscope.



**1962:** Ivan Sutherland, develops the light pen and a program called Sketchpad.



**1977:** Dan Sandin, Richard Sayre, and Thomas Defanti produce the first data glove.



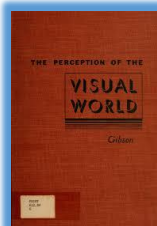
**1987:** Star Trek: The Next Generation introduces the "holodeck."



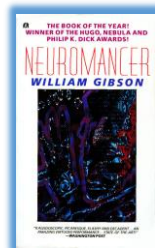
**1999:** The Matrix, a movie based on virtual reality.



**2011:** Palmer Luckey develops the Oculus Rift in parent's garage.



**1950:** US Air Force psychologist James Gibson publishes "The Perception of the Visual World"



**1983:** William Gibson invents the term "cyberspace."



**1989:** Jaron Lanier coins the term "virtual reality."



**2014:** Facebook announces \$2 billion acquisition of Oculus

# VR Benefits from Declining Costs

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# Types of VR Environments

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**Mobile**



**Room Scale**



**Location Based**



# Various VR Platforms

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**Oculus Rift/  
Facebook**



**Samsung  
Gear VR**



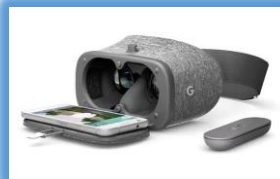
**HTC  
Vive**



**Sony  
Playstation VR**



**Google  
Daydream**



**Google  
Cardboard**



**Open Source Virtual  
Reality (OSVR)**



**IMAX/Starbreeze  
/Acer**



**Microsoft  
Hololens / WMR**



# Enhancing the Experience

## OSSIC X

3D audio



## Manus VR

data glove



## Virtuix Omni

motion platform



## Leap Motion

sense hand movement



## WhirlwindVR Vortex

next generation haptic



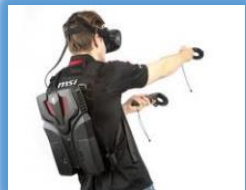
## 3DRudder

foot controller



## MSI VR One

backpack PC



## VirZoom

bike trainer



## Woojer

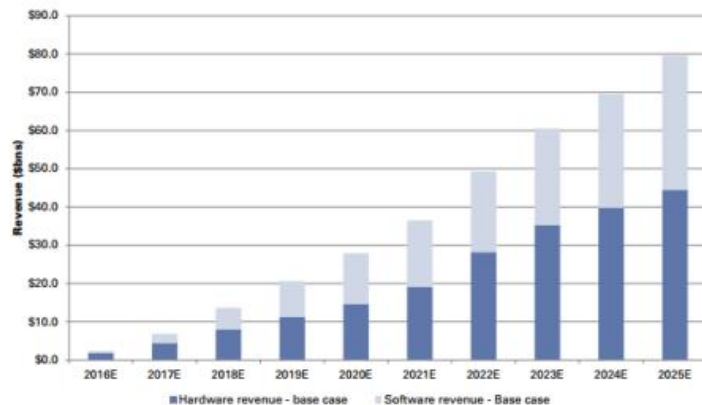
feel the sound



Note: some are pre-release

# Market Forecasts

**Exhibit 5: The progression of our base case hardware and software forecasts**

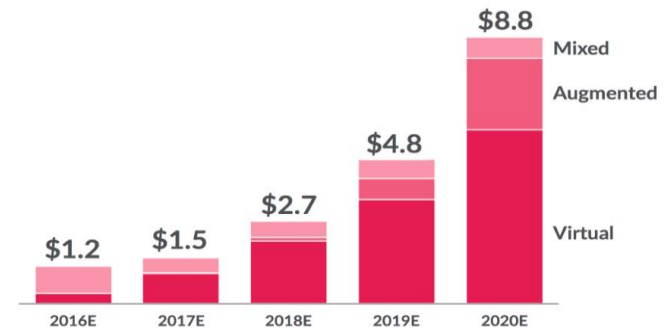


Source: Goldman Sachs Global Investment Research.

## VR/AR/MR games revenue forecast

### Estimated games revenue by platform: 2016E–2020E

Billions of USD, worldwide



Source: *Virtual Reality Industry Report 2016*. SuperData's research approach to the consumer-centered virtual reality market includes retail checks, executive interviews with decision-makers from all of relevant firms in the marketplace, pricing data, survey-based consumer tracking, and digital content purchases collected from our data providers.

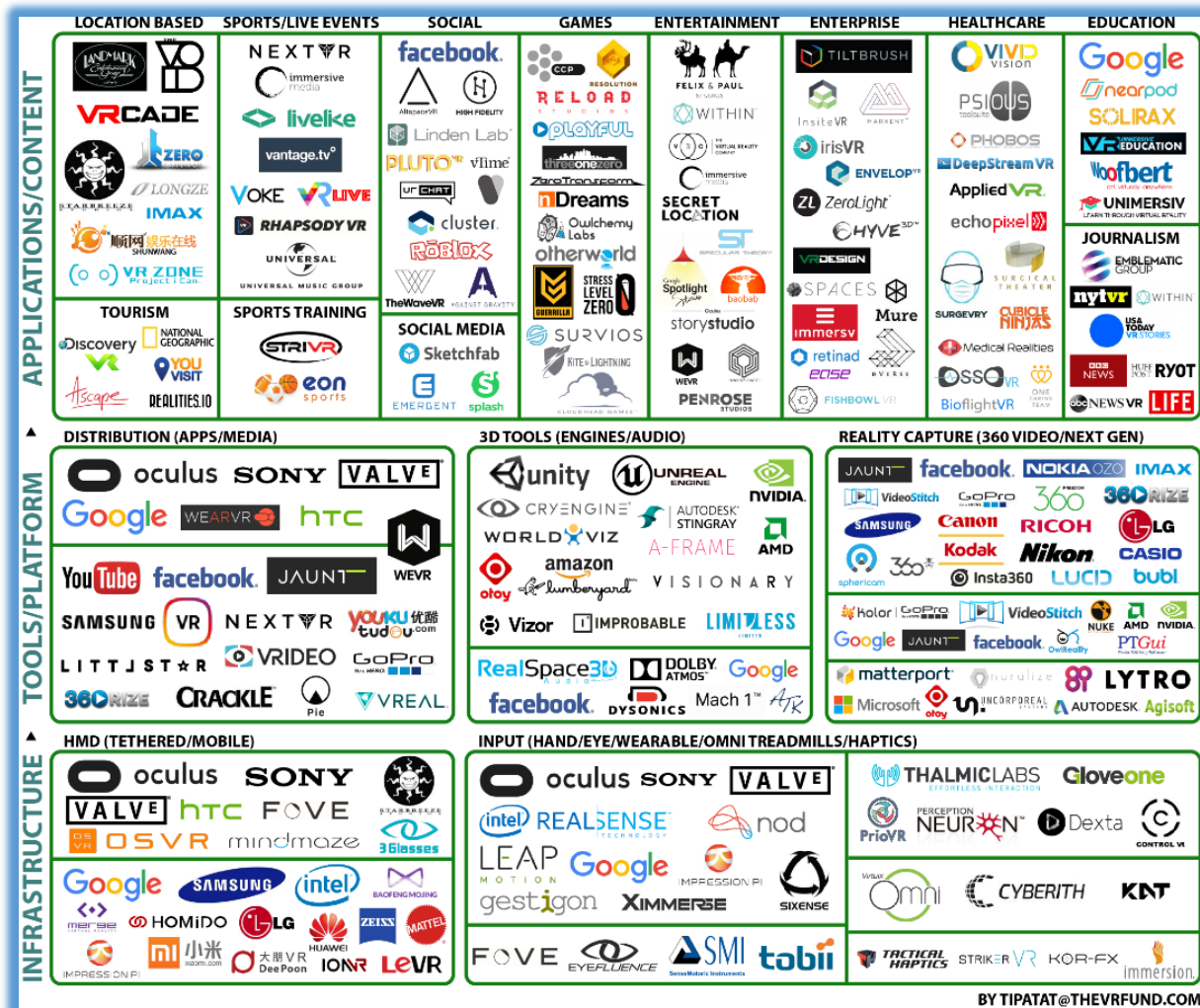
SUPERDATA

## Worldwide Augmented and Virtual Reality Hardware Shipments and 5-Year CAGR (shipments in millions)

Product Category	2016	2020	2016-2020 CAGR
	Shipments	Shipments	
Virtual Reality Hardware	9.6	64.8	183.8%
Augmented Reality Hardware	0.4	45.6	189.8%

Source: IDC, April 2016

# Industry Landscape





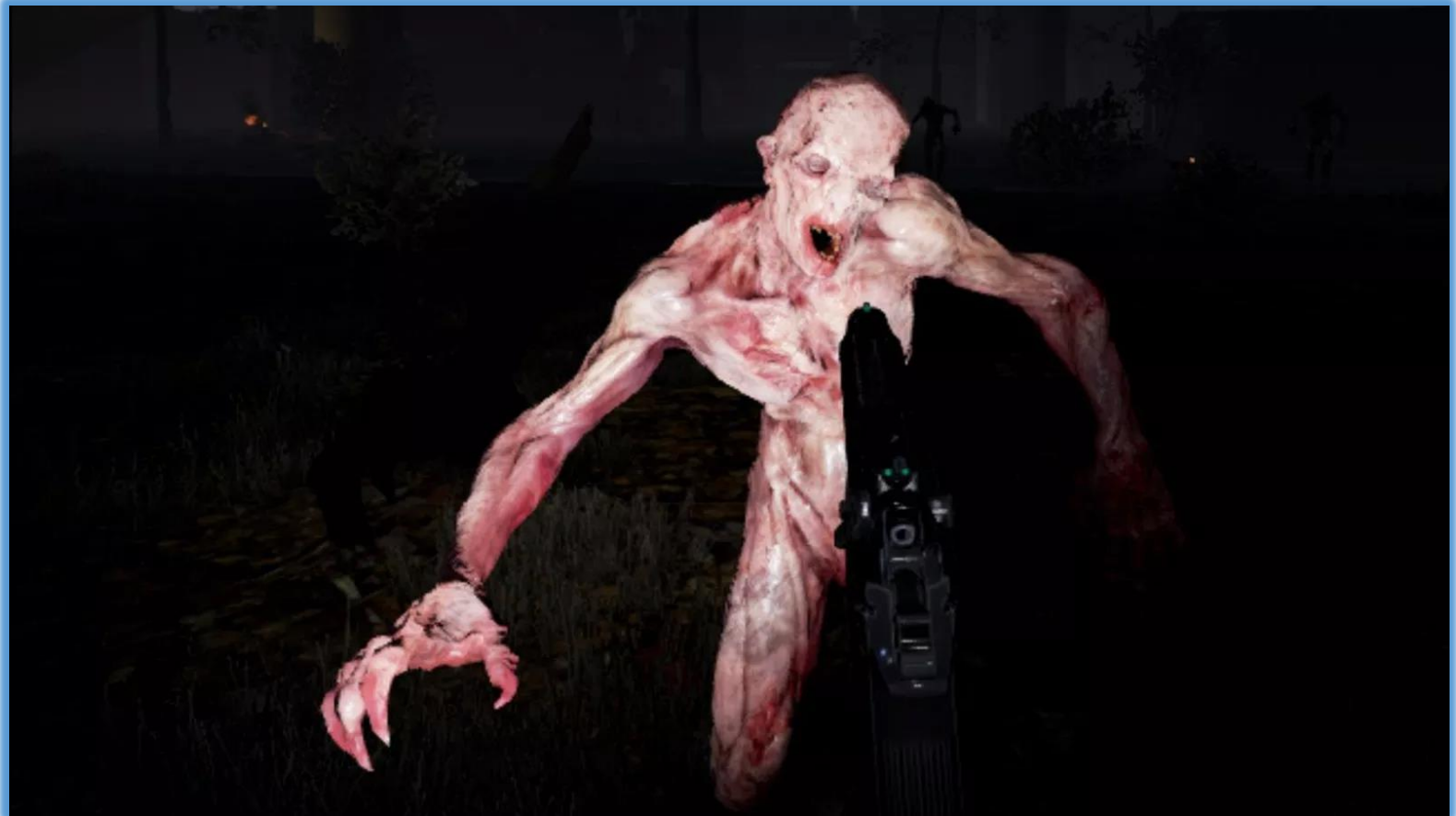
# Uses of Virtual Reality (A Sampler)

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# Zombies are VERY Popular

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# VR can be Social, Interactive and Fun

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# Examples of Non-Gaming VR Apps

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# Attending a Presidential Debate

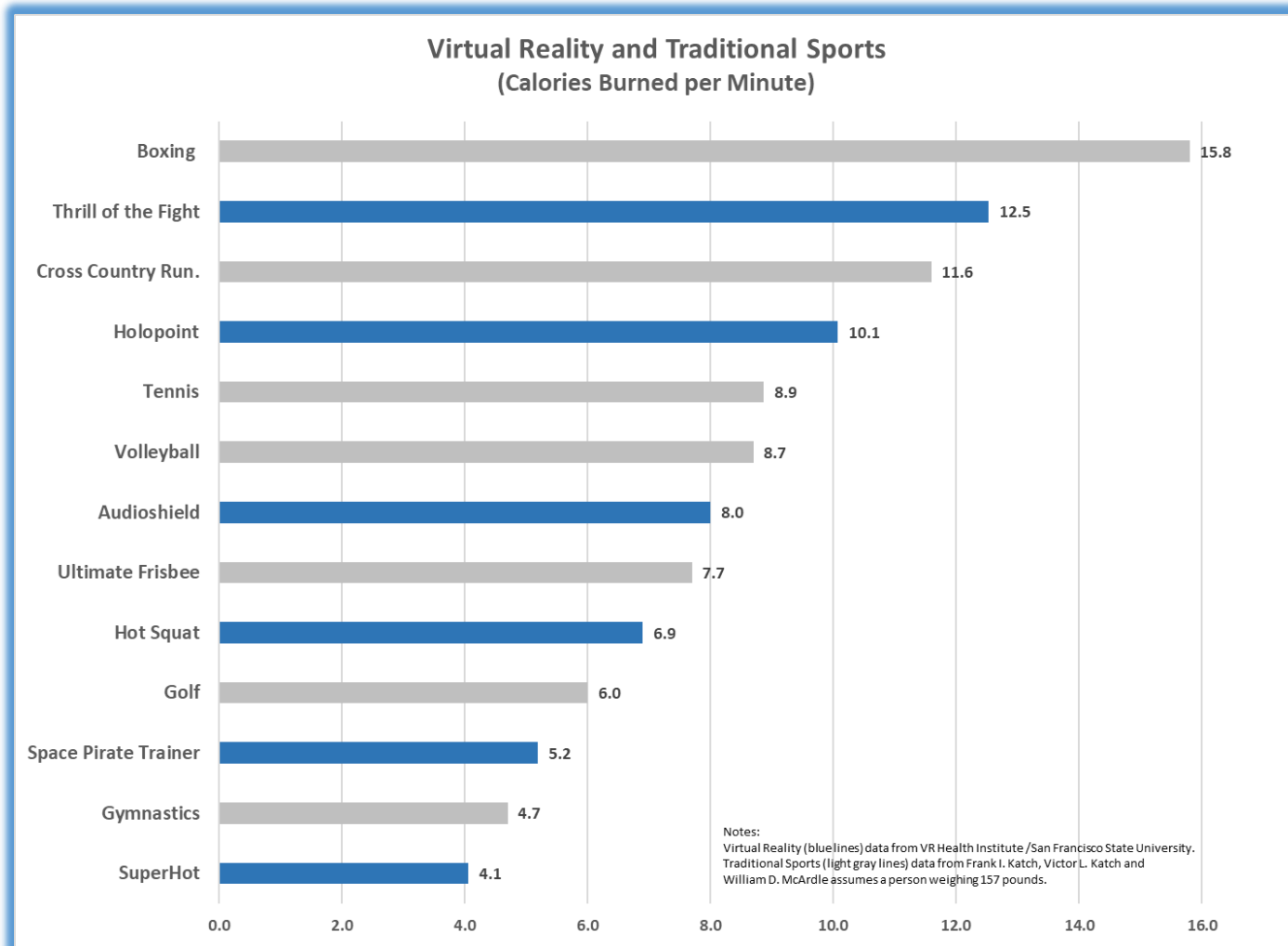


# Interacting with Hamlet



To Be With Hamlet

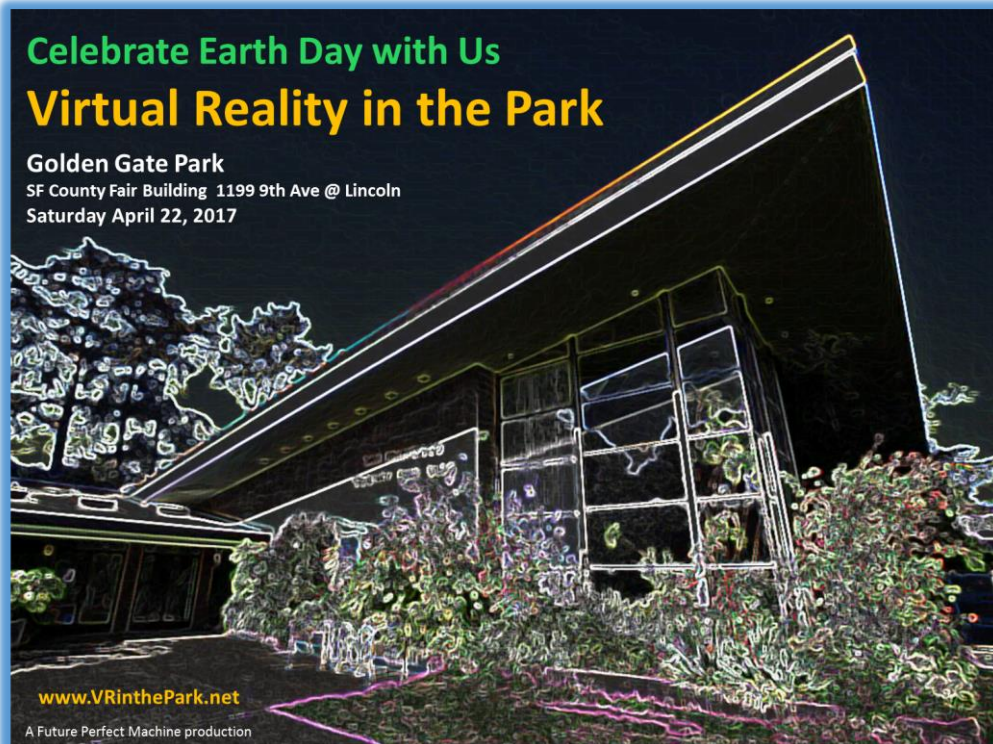
# VR can Burn Calories





# Virtual Reality in the Park: 2017

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A community-focused event providing attendees with "hands-on" VR experiences.

Attendees represented diverse age groups – the youngest – 4 ½ years old, several were in their late 70s.

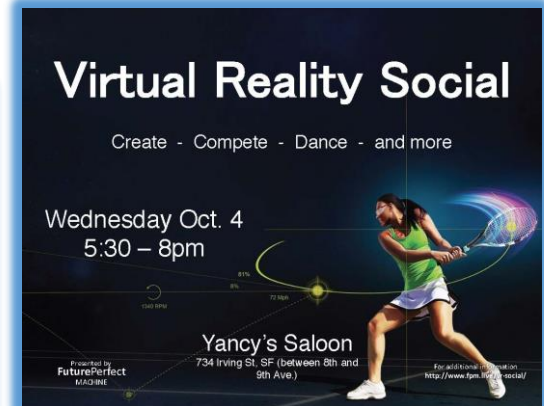
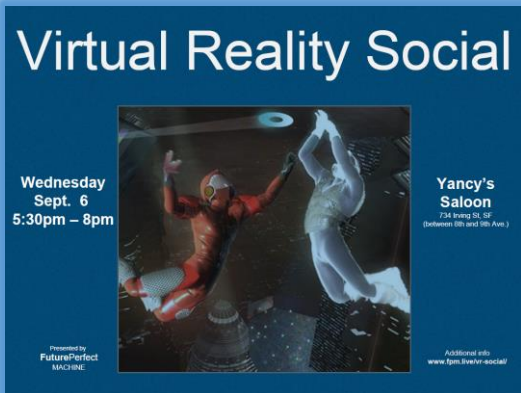
VR systems included Facebook/Oculus, HTC Vive, Samsung Gear VR, Google Cardboard and Microsoft Hololens.

Experiences included:

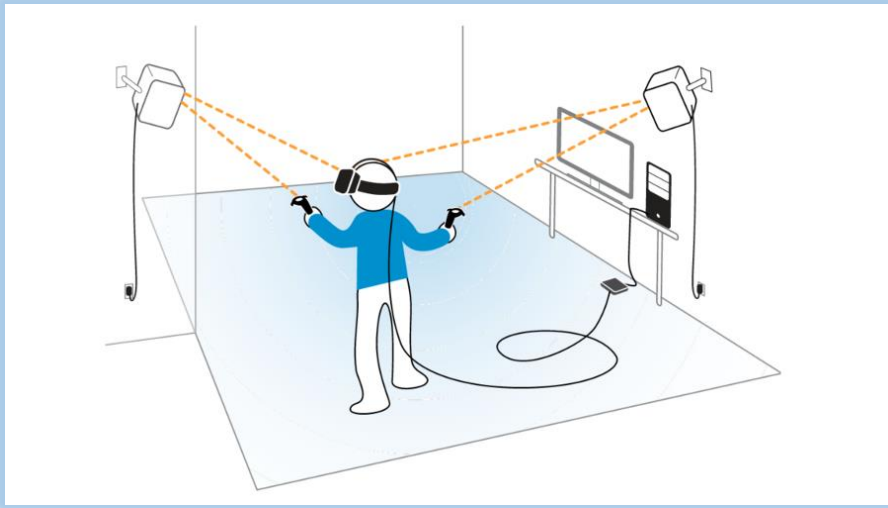
- Painting in 3 dimensions
- Composing music in new ways
- Exploring ocean habitats
- The work of Oscar-Winning designer
- Meeting a rocket scientist
- Encountering Shakespeare's Hamlet
- And more

Some event photos at [www.VRinthePark.net](http://www.VRinthePark.net)

# VR Social at Yancy's Saloon



# Configuration Overview



Head Mounted Display (HMD) connected to high-end PC.

Infra-red trackers, 12 – 15 feet apart, mounted to light stands or walls. Units are not connected to the PC.

To broaden experience to other attendees, mirror video to a projection unit or screen and audio to a sound system.



Friends and others watch the action.



Let the Fun Begin!



# Paul Dravis - Background

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- Involved with technology, finance and public policy as a software developer, business strategist, investor and more.
- Worked with organizations such as the **World Bank, JP Morgan, Microsoft, SAP, Government of Jordan** and others.
- Within the education sector, he is a member of a Technology Steering Committee at **Barnard College** (New York), working with both the Center for Urban Science and Planning (CUSP) and the Entrepreneurial Institute at **NYU** and technology advisor to the **Altamira International School** (K-12) in Barranquilla, Colombia.
- Founded “Future Perfect Machine” to explore and apply innovative technologies that can benefit individuals, communities and society. Focus areas include **geospatial technologies** (such as virtual and augmented reality), artificial intelligence and more.
- VR efforts include work with **Independent Television Service, Twitch, General Assembly, San Francisco Public Library, St. Anne’s School** (San Francisco), **Altamira International School** (Barranquilla, Colombia), **New York University’s Media and Games Network** (Brooklyn) and others.

# FuturePerfect

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