

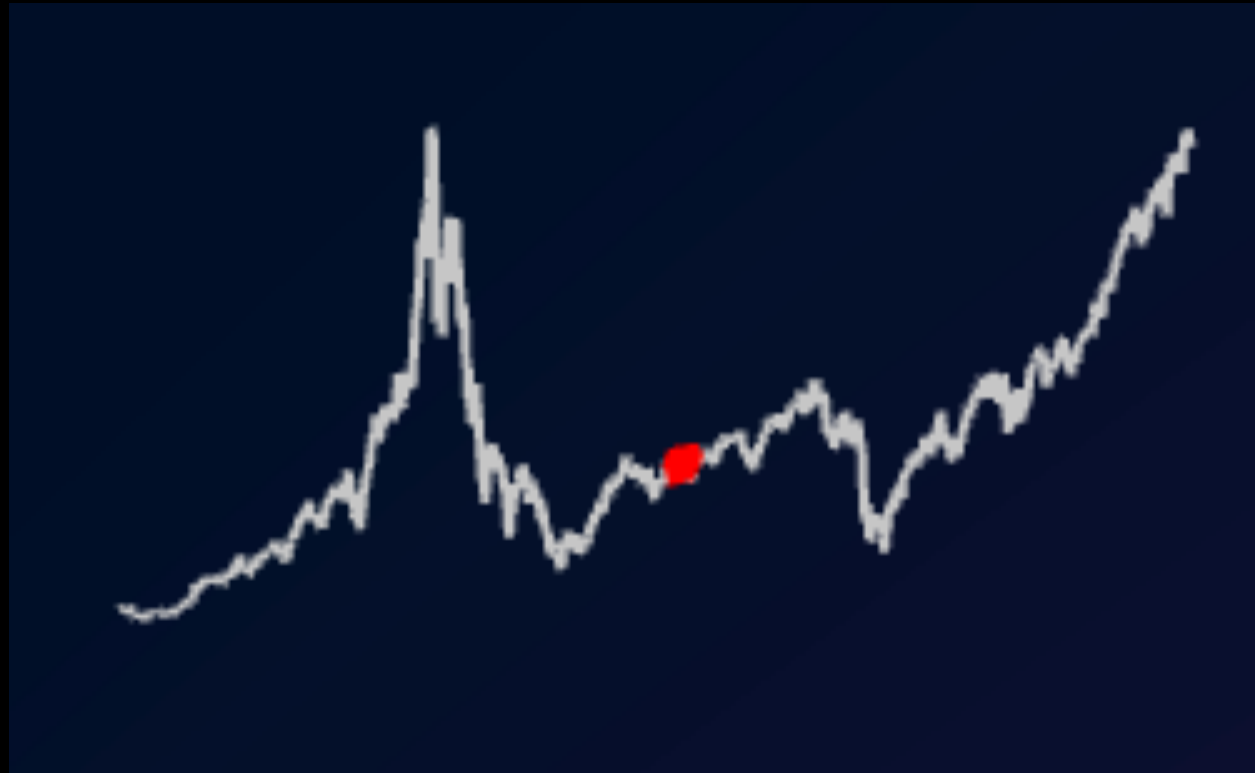
# Designing Virtual Reality Data Visualizations

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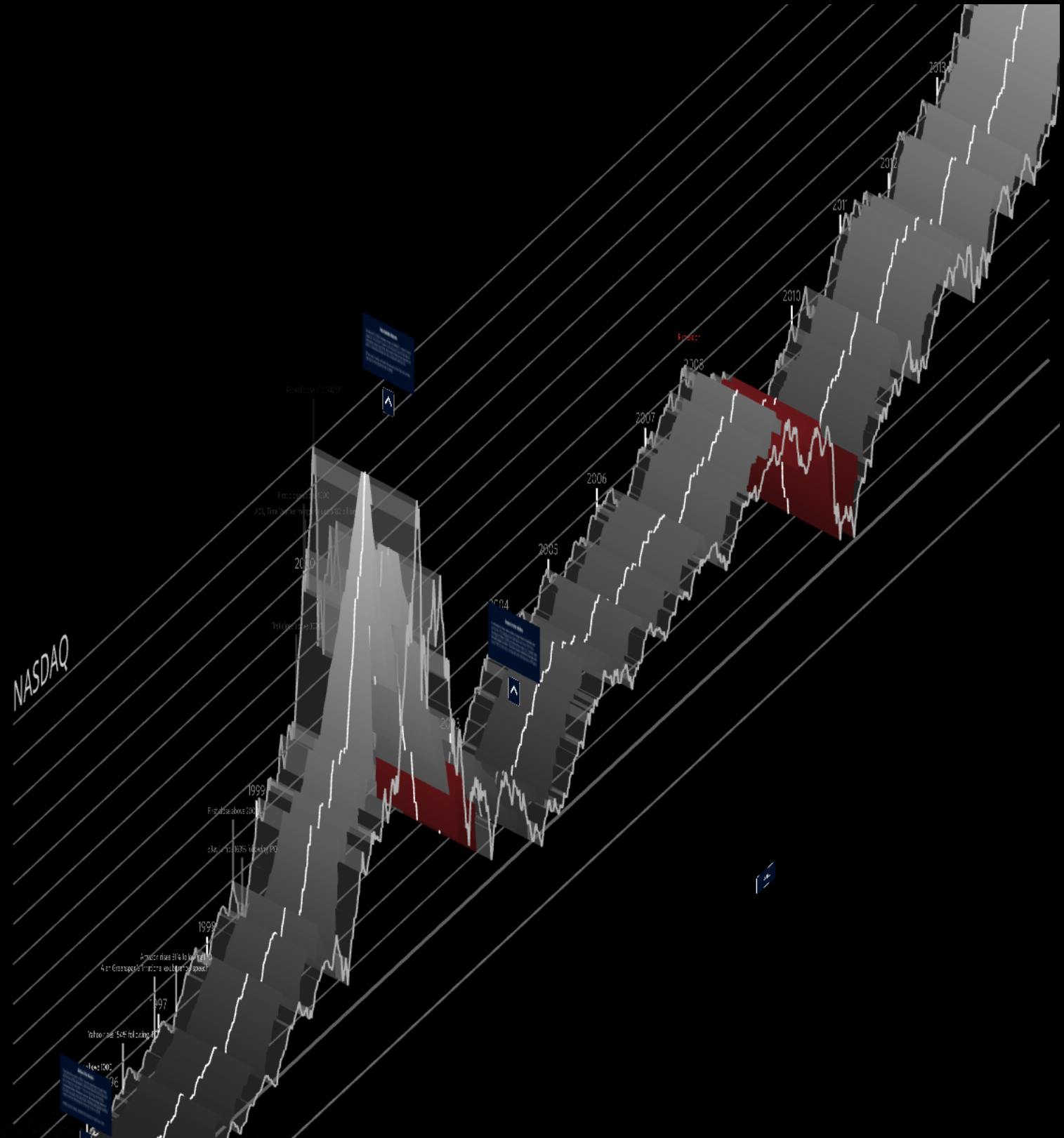
@ana\_becker

# What's VR?

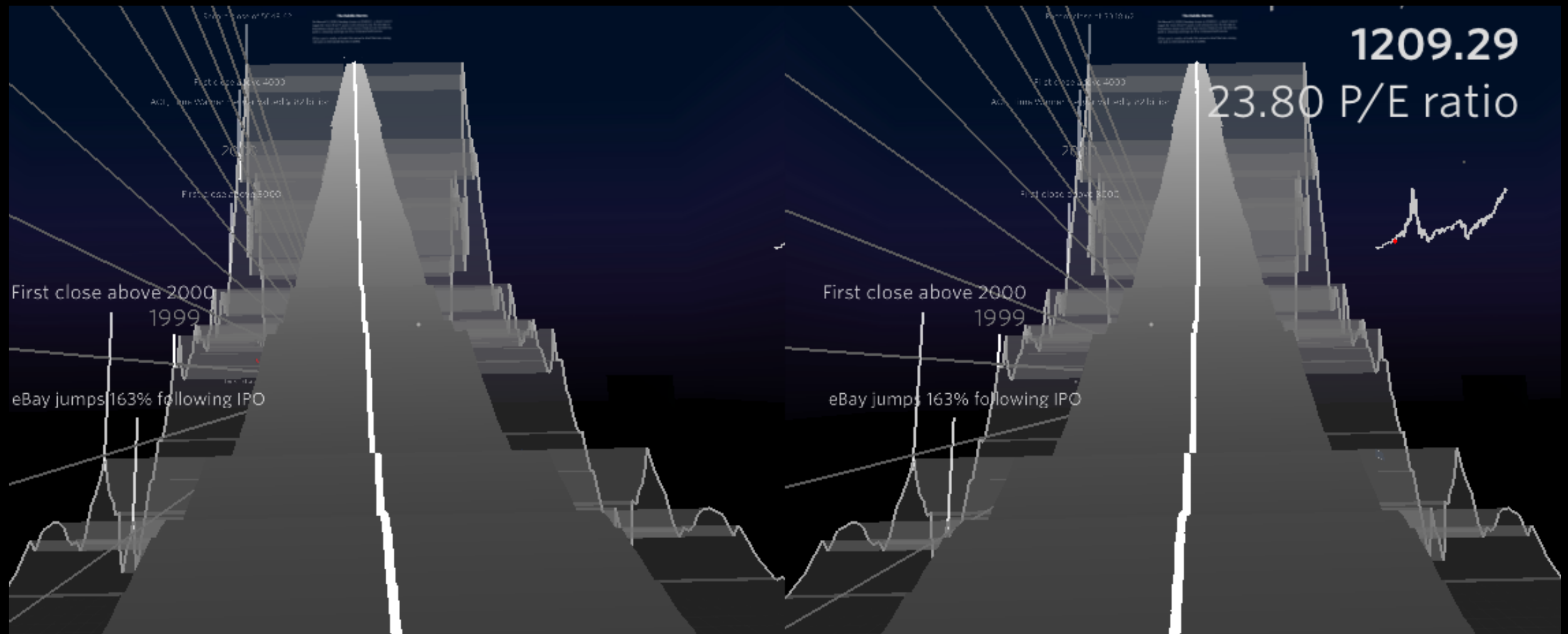
2D



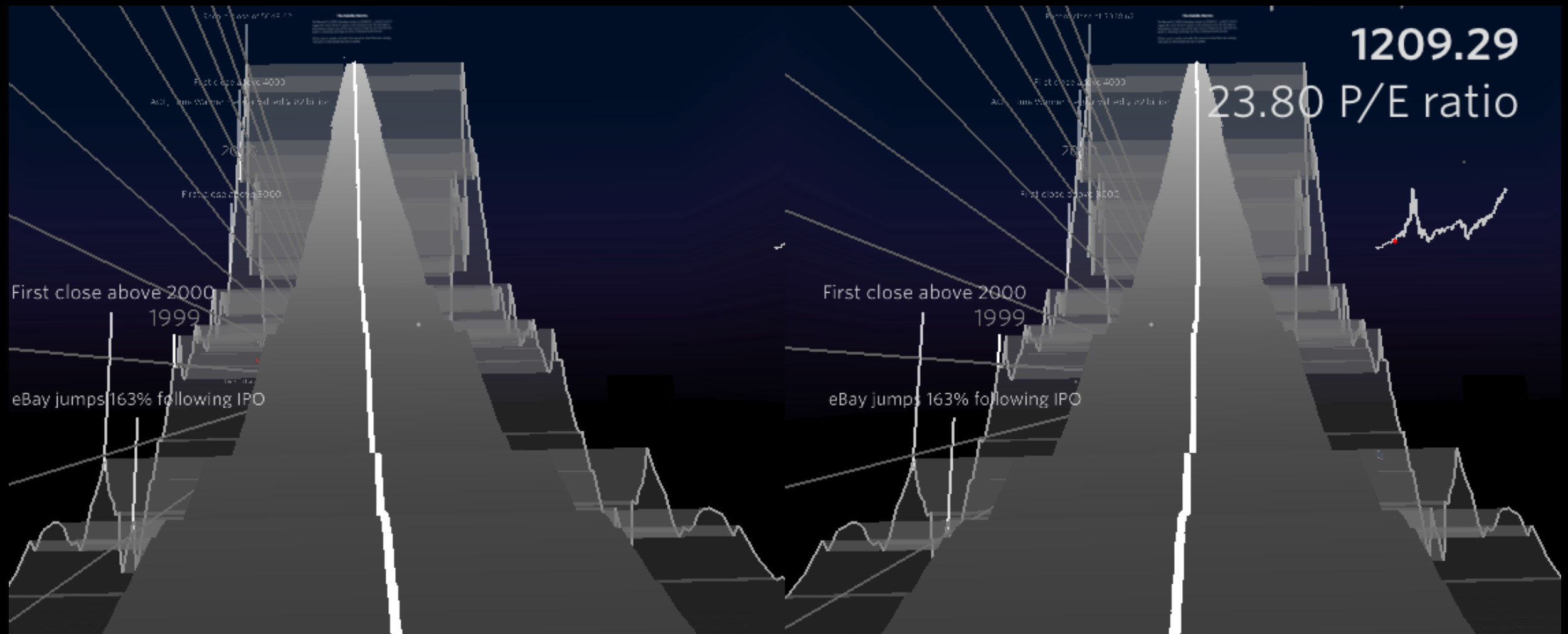
# 3D



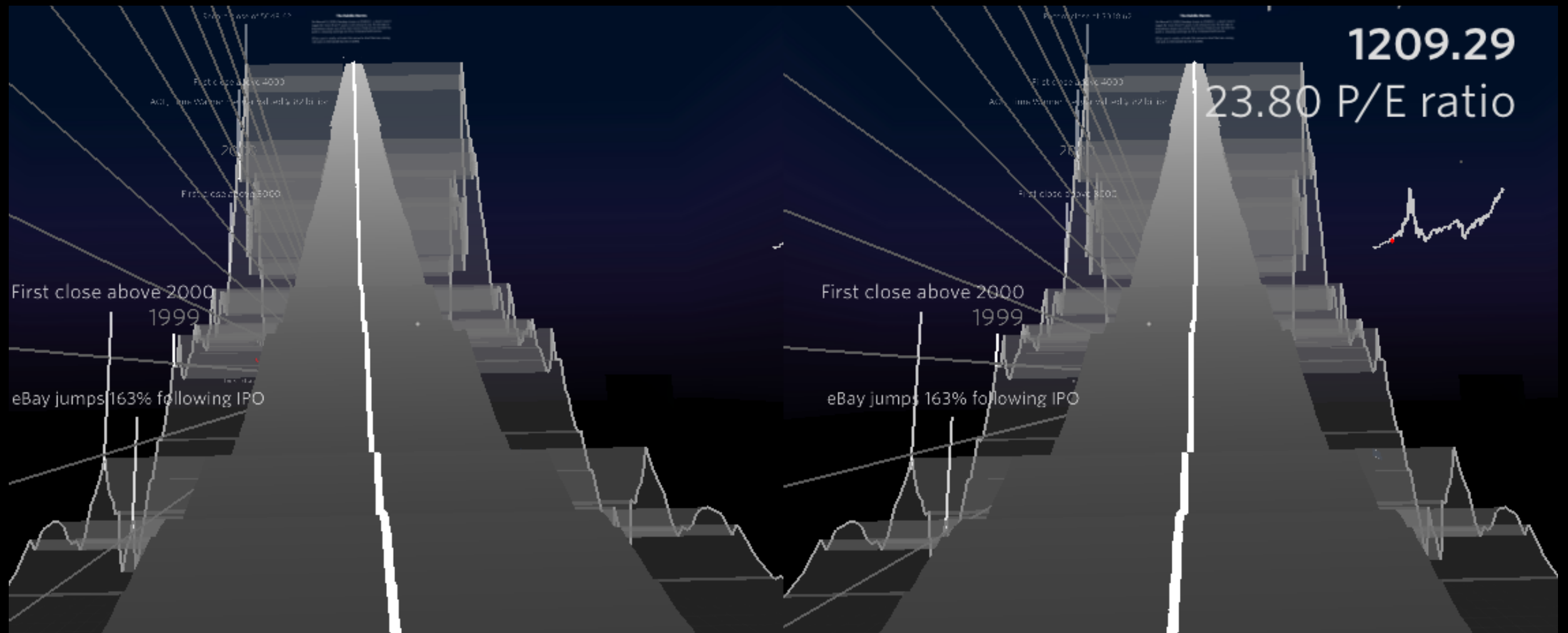




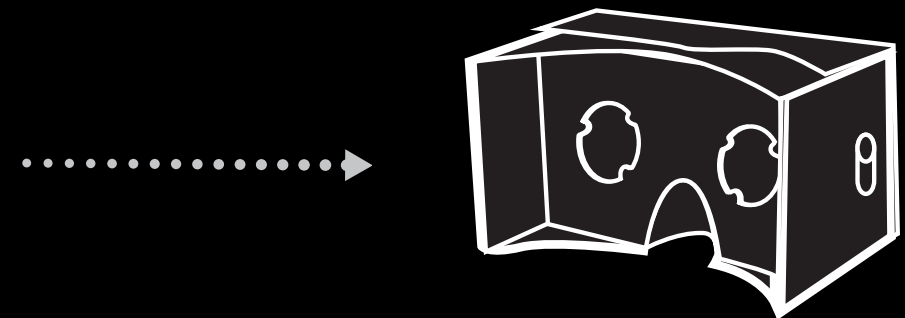
**VR = Stereoscopic 3D**



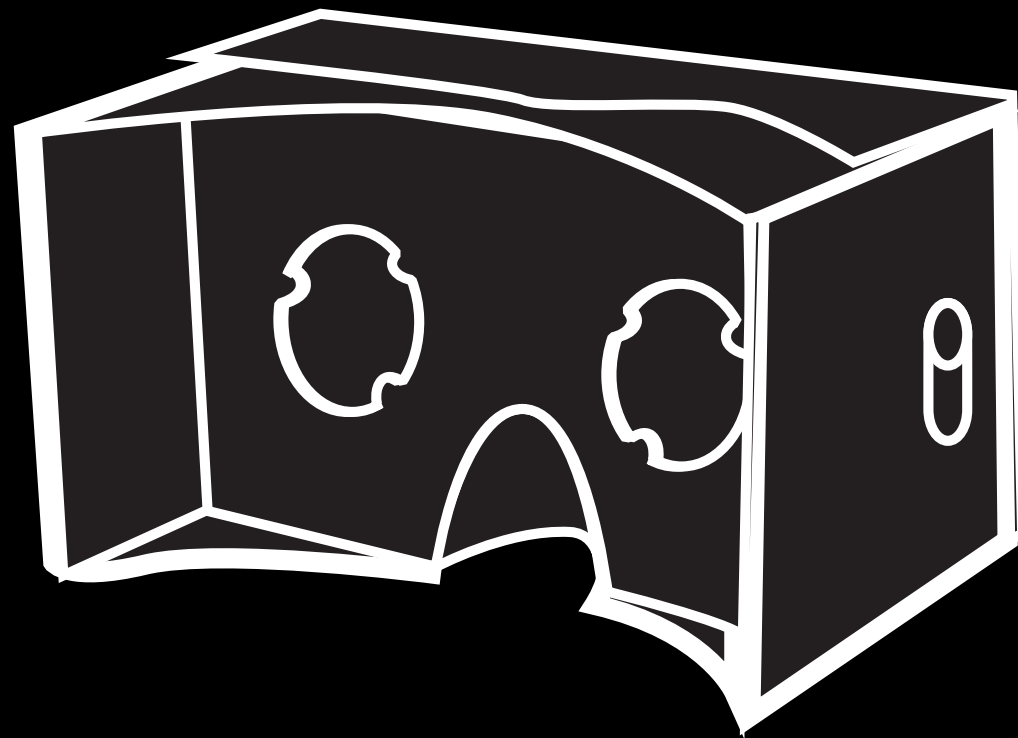
**VR = Stereoscopic 3D + time**



**VR = Stereoscopic 3D + time  
+ A thing on your head**



If you don't have this thing:



...go get it.

# CE Compass Google Cardboard - Valencia Quality 3D VR Virtual Reality Glasses Tool Kit for 5.0" Screen iPhone Samsung HTC Moto X Smart Phone

Description



Sold by: Ce Compass Inc  
a [Sears Marketplace](#) seller

Regular price

**Your savings**

\$14.99

- \$10.00

**\$4.99**

Eligible for Shop Your Way Points

☒ In Stock for Shipping  
enter ZIP code for details

Quantity:  [Add to Cart](#)

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BOOM

# Why's it cool?

## Because it HACKS YOUR BRAIN

Your mind is tricked into believing that you are present in the world that is rendered. You experience senses and reactions as if that world were real. If you look down off a "precipice" — it's scary. If a "spider" crawls on your "arm" — you feel it!





A black spider is positioned in the center of the page. Above it, there is a red bracket containing the word "Larva" in a red font. The background features faint, large text from another page, including "ore sp", "[00000000]", "ess sp", and "La".

**- LOOK HERE**

Less spiders

$$[\quad \uparrow \quad]$$

LOOK HERE

# Arachnophobia

# Exposure Level

A circular, textured object, possibly a coin or medallion, featuring a stylized, calligraphic script or symbol in the center. The object has a brown, aged appearance with a rough, mottled texture. The central symbol is white and resembles a stylized '3' or a calligraphic character. The object is set against a dark, textured background.





Two kinds of VR

360° Video

# 360° Video



**Harvest of Change**  
The Des Moines  
Register



**The Displaced**  
NYT Magazine



**Behind the Scenes at  
Lincoln Center**  
Wall Street Journal

# Rendered

3D rendered environments

# How do you make it happen?

## 360° Video

- A whole crap-ton of Go Pros
- New fancy 360 cameras



## Rendered

3d-rendering software

- Unity
- three.js

three.js

# Timeline

Jan 2012 Nonny de la Peña debuts “Hunger in Los Angeles”

July 2014 Google debuts “Cardboard,” a low-cost VR viewer.

...some other stuff...

now

# The state of VR in journalism:

Mostly 360-video based, thus far.

What I want to see more of:

Taking advantage of the  
experiential quality of VR to tell  
data-driven stories

- POV / Datavized
- VR Nasdaq

# POV / datavized

- Brian Chirls
- WebVR Toolkit





# datavized

virtual experiences with real impact

# VR Nasdaq

We made this thing. Here's a demo.



WSJ

Aug. 27, 2004

1862.09

26.90 P/E ratio



START RIDE

# How'd we do it?

Google chrome VR template

d3.js + three.js = Open-source libraries!

Roger Kenny is THE MAN

# How'd we do it?

Roger Kenny is THE MAN

<http://www.storybench.org/how-to-make-a-simple-virtual-reality-data-visualization/>

# Why'd we do it?

A visceral understanding of the precariousness of the 2000 bubble vs. the relative stability of today's Nasdaq. Using the brain's processing of space to reinforce this understanding.

# Why'd we do it in the browser?

Anyone can look at it!

No need to go through 3rd party player for 360-deg video!

No need to do stitching, that is really tedious  
or work with HUGE GIANT VIDEO FILE

# Some Challenges



*Many* Challenges

Kind of a lot of  
Challenges

# Kind of a lot of Challenges

User interactions

Eye strain / information density / nausea / perceptual lack

Accessibility

Not being gimmicky

For 360-vid:

stitching, stitching, stitching.

How to publish?!

# User Interaction

# User Interaction

How do you design an interactive  
**WHEN YOUR USER HAS NO HANDS**



# User Interaction

How do you design an interactive  
**WHEN YOUR USER HAS NO HANDS**

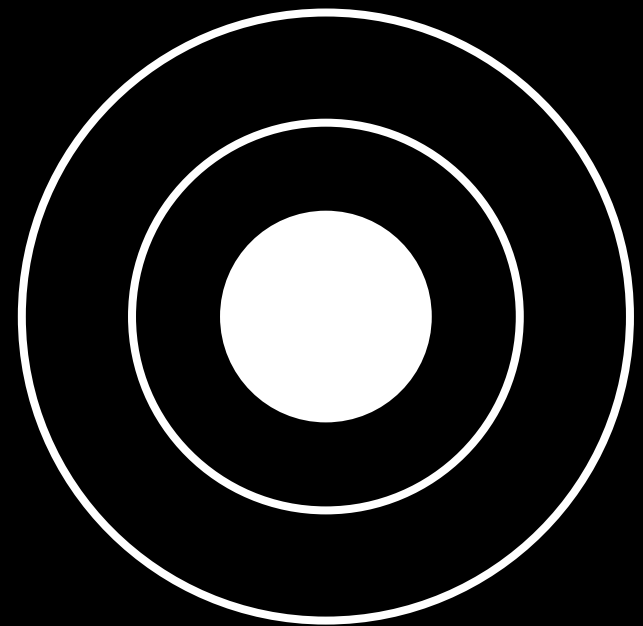
inputs:

- Focal point
- Button on the side of headset



# User Interaction

to select buttons using focal point:



# User Interaction

Possibilities might open up when more people are using headsets in conjunction with joysticks or other controllers



# Information Density

Has to be kind of low. It's hard to read text in VR!

# Nausea

Eye strain and nausea are real things

# Perception Difficulty

As Kennedy mentioned in her talk - humans are not that good at reading 3d charts



????????

# Gimmickiness

Making a VR chart for the sake of making a VR chart  
without any actual use for the medium

=

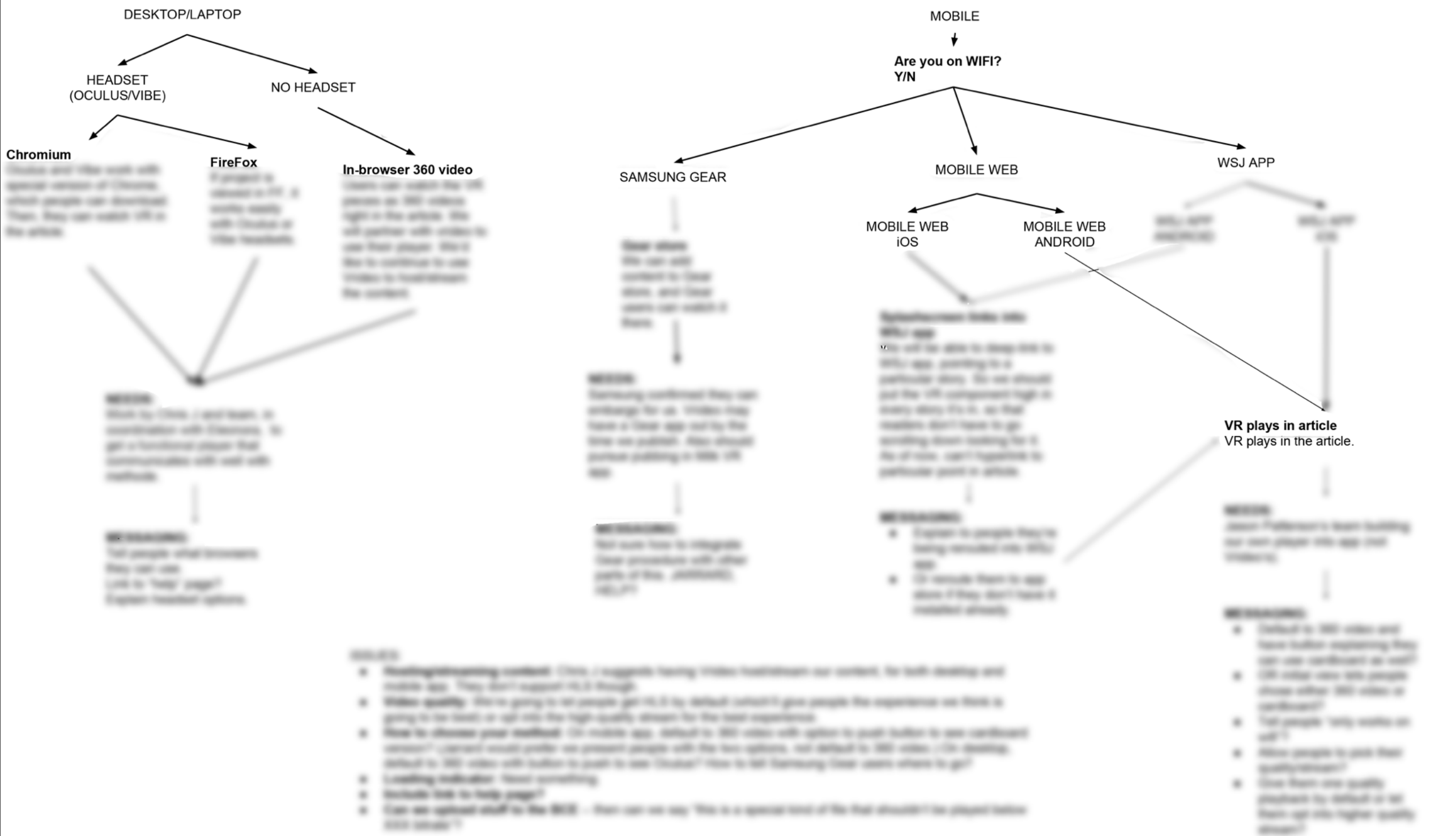
100% chance Twitter will make fun of it  
(and also you)

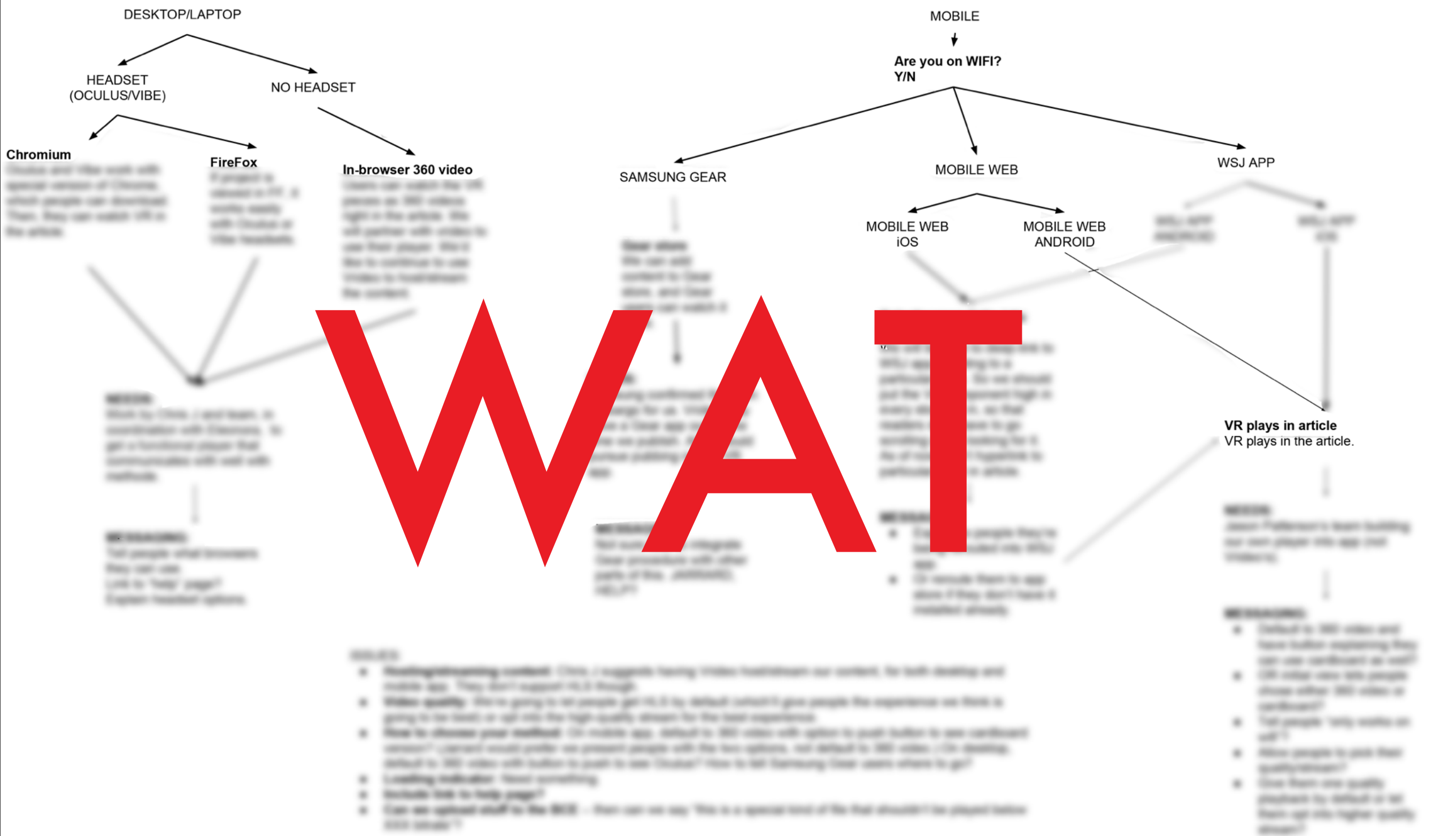
# Accessibility

People don't generally have headsets yet  
Design for cardboard

Lots of people don't have cardboard yet either  
Have a fallback.

Cross-device compatibility/  
different viewing options







# RUNDOWN:

## VR line chart vs 2d line chart

- + 3rd dimension
- + time dimension
- + magic brain hacking feelings-feeling
- interactions
- ease of navigation
- accessibility
- legibility
- perceptual accuracy
- + heightened risk of people making fun of you on Twitter

# What's the future of it? What's it good for?

- Multi-dimensional data
- Using people's FEELINGS ABOUT SPACE to communicate stuff about datasets

# What's the future of it? What's it good for?

- Multi-dimensional data
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BUT HOW?!

# What are some FEELINGS ABOUT SPACE?

- Fear of heights
- Walking on small areas is difficult
- Red might mean danger
- Moving quickly feels different than moving slowly
- Flying is cool
- Pointy things might hurt
- Large things might be heavy

ETC ETC FOREVER

# Is it a fad?

Hell nah

(or at least, I've had the kool aid)

kids dig it

and they're the future of computing

# The Coolest Sh\*t I have EVER SEEN

- Machine to Be Another
- HTC Vive
- Oculus Toybox
- TriBeCa Film Fest Interactive



# The Machine to Be Another



# HTC Vive + Tilt Brush



<https://www.youtube.com/watch?v=EYY-DZ14i9E>



# Oculus Toybox



# TriBeCa Film Fest Interactive



Haunt

Injustice

Haven

Mars 2030

a bunch of other VR stuff



# Thank you.

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# Resources

<https://www.google.com/get/cardboard/>

<http://www.storybench.org/how-to-make-a-simple-virtual-reality-data-visualization/>

[wsj.com/3dnasdaq](http://www.wsj.com/3dnasdaq)

<http://datavized.com/>

<http://www.pbs.org/pov/blog/povdocs/2015/02/how-anyone-can-create-virtual-reality-experiences-with-one-line-of-code/>

<http://storynext.gannett.com/state-of-vr.pdf>

<http://www.themachinetobeanother.org/>

[https://tribecafilminstitute.org/events/exhibits/tfi\\_interactive](https://tribecafilminstitute.org/events/exhibits/tfi_interactive)

**BONUS**

***My Grandparents Try VR***