VR headsets such as Oculus Rift and HTC Vive.

Full rich experience and interactivity.

Accessibility.

Smartphones (Daydream/Google Cardboard) retain “immersive quality.” VR-capable smartphones retain 3D features and majority of interactivity.

The AI Revolution – Ben Greenberg

#FourHealthEmergingTech

@fourhealthmedia
The AI Revolution
What do physicians actually think about AI in Healthcare?
ARTIFICIAL INTELLIGENCE

Programs with the ability to learn and reason like humans
ARTIFICIAL INTELLIGENCE
Programs with the ability to learn and reason like humans

MACHINE LEARNING
Algorithms with the ability to learn without being explicitly programmed
ARTIFICIAL INTELLIGENCE
Programs with the ability to learn and reason like humans

MACHINE LEARNING
Algorithms with the ability to learn without being explicitly programmed

DEEP LEARNING
Subset of machine learning in which artificial neural networks adapt and learn from vast amounts of data
Product:

- Feature Set
- Value Proposition
- UX

Product-Market Fit

Market:

- Underserved Needs
- Target Customer

Credit: https://leanstartup.co/a-playbook-for-achieving-product-market-fit/
Problem Space vs. Solution Space

**Problem Space**
- A customer problem, need or benefit that the product should address
- A product requirement

**Solution Space**
- A specific implementation to address the customer need or requirement
<table>
<thead>
<tr>
<th>Problem Space</th>
<th>Solution Space</th>
</tr>
</thead>
<tbody>
<tr>
<td>A customer problem, need or benefit that the product should address</td>
<td>A specific implementation to address the customer need or requirement</td>
</tr>
<tr>
<td>A product requirement</td>
<td></td>
</tr>
</tbody>
</table>

**Example**

- Ability to write in space (zero gravity)

- Space pen: $1 M R&D cost

Credit: https://www.slideshare.net/productschool/the-lean-product-playbook-with-dan-olsen
<table>
<thead>
<tr>
<th>Problem Space</th>
<th>Solution Space</th>
</tr>
</thead>
<tbody>
<tr>
<td>A customer problem, need or benefit that the product should address</td>
<td>A specific implementation to address the customer need or requirement</td>
</tr>
<tr>
<td>A product requirement</td>
<td></td>
</tr>
<tr>
<td>Example</td>
<td></td>
</tr>
<tr>
<td>Ability to write in space (zero gravity)</td>
<td></td>
</tr>
</tbody>
</table>

**Example**
- **Problem Space**
  - Ability to write in space (zero gravity)
- **Solution Space**
  - Space pen: $1 M R&D cost
  - Russians: pencil

Credit: https://www.slideshare.net/productschool/the-lean-product-playbook-with-dan-olsen
In the 2030s, we’ll have nanobots in our blood that will make us superhuman.

[Kurzweil]
Al’s True Medical Potential

- Discover new drugs
- Diagnose rare conditions
- Predict disease
- Perform surgery
- Eliminate administrative duties

Photo credit: Singularity Hub
Posting with permission. AI people: What would you say to him? I will share my thoughts later.

From: [redacted]
Date: Sun, Jul 9, 2017 at 3:23 PM
Subject: Radiology
To: Andrew Ng

Dear Andrew Ng,

I'm 3 years into specialist radiology training. Should I quit and do something else? I.e. How close are radiologists to being replaced?

Many thanks

Dr [redacted]

9:23 AM - 11 Jul 2017 from Oakley, CA

789 Retweets 1,340 Likes
Methodology

Medscape survey of 1,503 Medscape member physicians, February 1 to 22, 2018.

Surveys were conducted among physicians actively practicing in:
- US (n=500)
- EU5 (n=500)
- LATAM (Argentina, Brazil, Chile, Colombia, Mexico, Peru: n=503).

Surveys averaged 7 to 9 minutes in length. In the US, Medscape members who completed the survey were entered into a sweepstakes that awarded 25 random winners a $100 Amazon gift card. Results are unweighted.
33% “I feel my role could be threatened or undermined in the future by AI-powered software”
15%

“To date, AI has changed the way I practice medicine.”
68% anticipate that within the next 10 years, AI will have a positive or very positive impact on how they practice medicine.
“AI-powered software will never be better than human physicians at diagnostic tasks.”
“Artificial intelligence will not replace radiologists. However, radiologists who use AI will replace those who don’t.”

-Dr. Bertalan Mesko
What does it mean for us?
“Discover how pharmaceutical brands are using Alexa to reinvent customer experiences!”
“In 2018, brands will have to reimagine the experiences they can offer physicians, and fast!”
“Otherwise, they’ll stand no chance of having a meaningful role in the world of the fully realized Internet of Things!”
Benefits Of Voice UI
Human can speak 140 words per minute vs. type 45
Human can speak 140 words per minute vs. type 45

Convenient and hands-free

Photo credit: Pexels
Human can speak 140 words per minute vs. type 45

Convenient and hands-free

Random Access vs. Hierarchical Navigation
Speech is an inefficient output modality.
Do you use a voice-controlled smart speaker at home? (e.g., Amazon Echo (Alexa), Google Home)

- Yes, I use Amazon Alexa: 32% (Europe), 7% (United States), 1% (Latin America)
- Yes, I use Google Home: 12% (Europe), 10% (United States), 13% (Latin America)
- Yes, I use another brand: 4% (Europe), 3% (United States), 3% (Latin America)
- No: 81% (Europe), 58% (United States), 85% (Latin America)
Do you use a voice-controlled smart speaker at work for professional purposes? (e.g., Amazon Echo (Alexa), Google Home)

- Yes, I use Amazon Alexa: 1% (Europe), 4% (United States), 1% (Latin America)
- Yes, I use Google Home: 5% (Europe), 3% (United States), 10% (Latin America)
- Yes, I use another brand: 3% (Europe), 3% (United States), 2% (Latin America)
- No: 92% (Europe), 90% (United States), 88% (Latin America)
How likely would physicians be to use a voice-controlled clinical decision support system offered by each of the following?

- An independent medical information provider: 49%
- A government institution: 48%
- A hospital system: 45%
- A technology company: 34%
- A pharmaceutical manufacturer: 17%

Response of 4 or 5 on a scale where 1 = Not at all likely and 5 = Very Likely
Amazon’s new Alexa developer policy now bans all ads except in music and flash briefings
VR headsets such as Oculus Rift and HTC Vive provide a full rich experience and interactivity.

Accessibility

Smartphones, such as those capable of VR through Daydream/Google Cardboard, retain a "3D feature" and majority of interactivity.