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CS147
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Stanford
 University

SMART INTERFACES
 TO TACKLE GLOBAL
 GRAND CHALLENGES

Some big, unanswered questions of AI

What is the next generation AI technology?

How do we align machine values with human values?

How can AI technology be best designed & deployed?

Human-Centered AI @Stanford

AI technology should be **inspired** by human intelligence

The development of AI should be guided by its human **impact**.

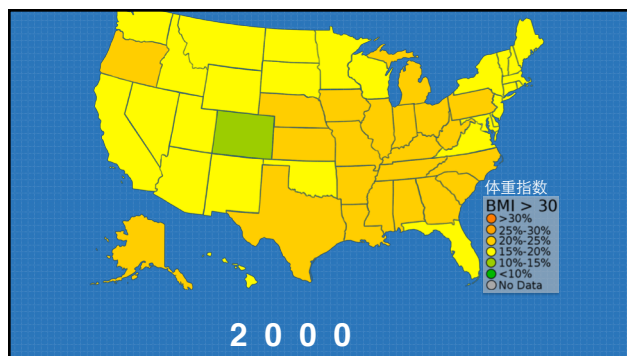
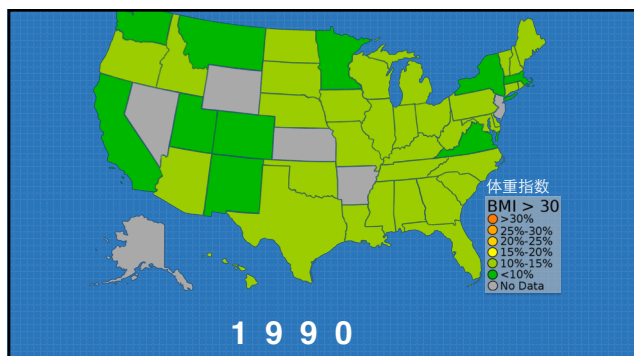
The goal of AI should be **enhancing** humanity, not replacing it.

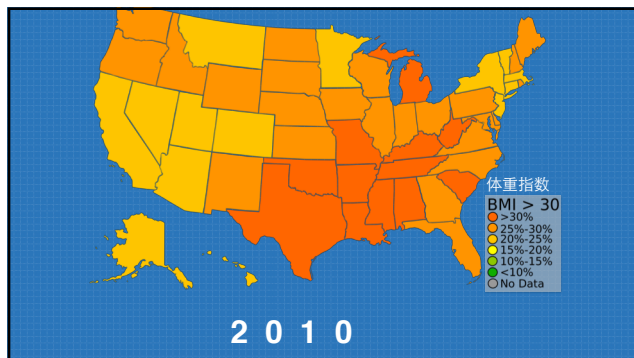
Human-Centered AI @Stanford

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The goal of AI should be **enhancing** humanity, not replacing it.





SURPRISING RESULT
 出人意料的结果

Thought activity inference the **key** feature
 以为活动的准确判断是最**重要**的特性

3-month field trial (n=28)
 3 key conditions

- full system (garden/activity)
- no activity inference (garden)
- no garden/ambient display (activity)

Only **garden** participants maintained exercise

Ambient display is the key feature!
 示范性界面是最**关键**的特性

UBIGREEN
 TRANSPORTATION DISPLAY
 交通工具形象展示

Fraehlich, et. al., CHI 2009

SURPRISING RESULT
 出人意料的结果

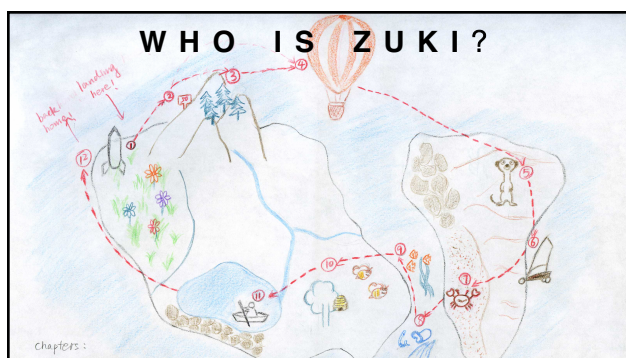
Thought ambient display simply for information

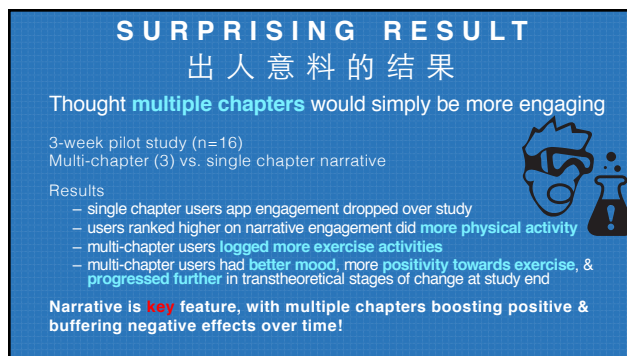
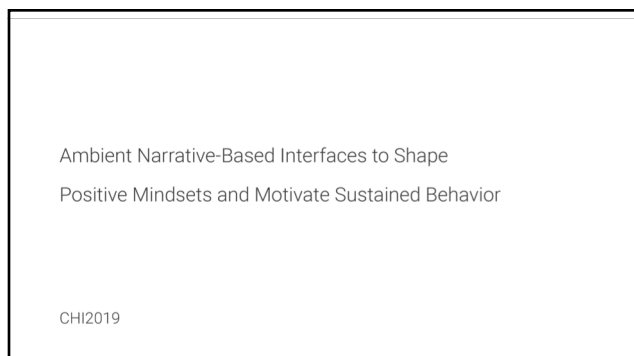
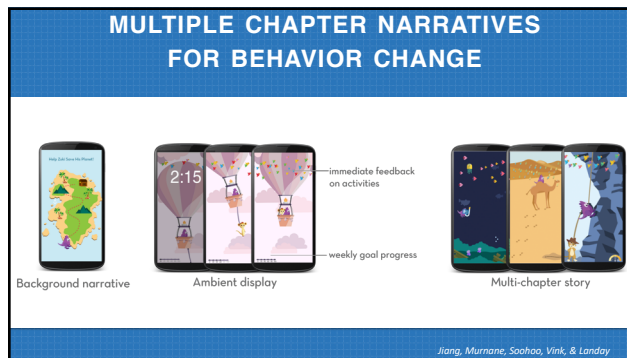
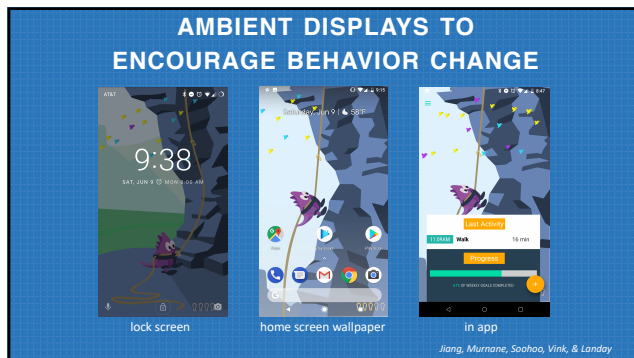
4-week pilot study (n=12)

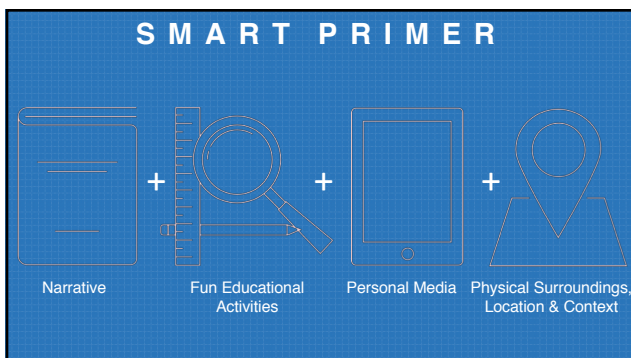
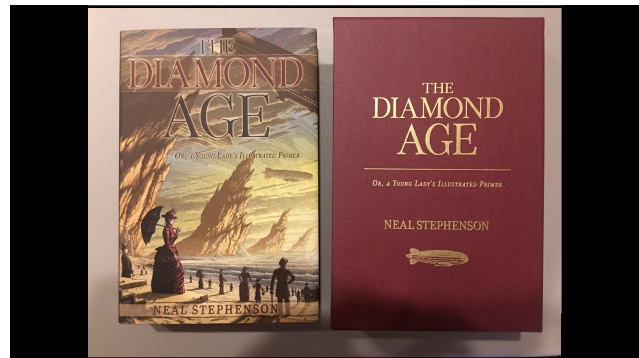
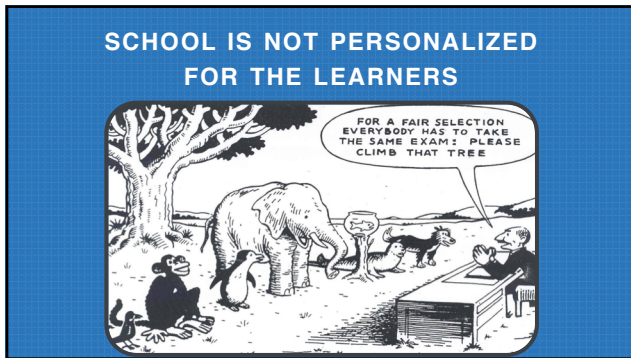
Results

- several wanted to keep using
- saw some behavior "change"
- many liked unfolding **story** or **game**

Use story to drive long-term engagement
 使用**故事**驱动用户长时间的参与







Restart About Contact

Archimedes Story

by Smart Primer Group

The History

For nearly one hundred years, the ancient Syracuse and Carthage had been at war as ruler after ruler fought each other for the throne. Finally, in 275 BCE, the troops from Syracuse grew weary of the inefficiency and selfishness of their leaders and elected commanders from amongst themselves. One of their chosen leaders was a young general named Hiero.



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returned to the king with a beautiful and intricate crown in the form of a laurel wreath, just as the king had requested. This crown weighed exactly the same as the gold the king had given to the smith and King Hiero, pleased with the work, rewarded the goldsmith.

King Hiero began preparations for the ceremony in which he would place the crown in the temple. But something has gone wrong. The king is furious, the festival has been put on hold, and the city is in turmoil.

Sherry's Task

Sherry is to travel to ancient Greece, figure out what is causing the king's anger and creating so much tension in the city, and fix the problem. Don't forget, it can get very hot in Greece; bring a disposable plastic water bottle back with you.


Ready to go undercover?

Move on to the next page when you are ready to proceed.

Restart About Contact


have. You see that box over there," the confectioner gestured to a large crate. "It's filled with sesame candies and I need to know how many there are. The number doesn't have to be exact; a good approximation'll do. But if you count that real quick and let me know what's left, I can tell you what I know about the crown, although I'm warning you, it isn't much."

Looking at the crate, Sherry noticed it was about the size of a shoe box, and each cube-shaped candy had the width, height, and depth that was about the same as the diameter of a quarter. The crate was about half full. Sherry decided that instead of counting the candies, he'd approximate how many could fit in the box.



Using these observations, how can Sherry approximate how many candies fit in the box without actually counting the candies?

Notice that you will need the following tools: the package box shown below, a quarter, scratch paper, and a pen. Also, feel free to write as you would like on the paper.



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MISSION:
 Find the volume and mass of the bottle filled with air and the bottle filled with dirt. You may find that submerging the bottles in a large bowl of water and measuring the amount of water you displace may help you measure the volume of the two bottles.

Click here for more hints

Air Filled Bottle **Dirt Filled Bottle**

Mass (in grams): Mass (in grams):

Volume (in mL): Volume (in mL):

Next

Restart About Contact

density than a lesser material such as silver. The density of gold is 19.32 grams per cubic centimeter.

"Now, I'm desperately in need of a bath, but I think with this knowledge we have enough information to solve the king's problem. Don't you? Will you write up a proposal for an experiment and bring it to me in the bath house just down the street when you are done?"

How will you determine whether the crown is gold or not?

Can we figure out the weight and volume of the crown? How?

Once we have the weight and the volume, can we find out the density? How?

What if the density is less than 19.32 grams per cubic centimeter? What if it's more?



CHATBOTS WILL CHANGE THE FUTURE OF EDUCATION

Even the most complex and subjective disciplines could be taught with the help of educational chatbots as tutors.

– Bill Gates

DOMAIN-SPECIFIC CHATBOTS

What are the units of density?

How do I measure volume?

What are coordinates?

What's density?

INTEGRATING CHATBOTS WITH ACTIVITIES

Sophia's Task

Now it's your turn to find how many candies the candy man had in the boxes on the picture below, write how many quarters fit along each of the width, height, and depth. Then answer the final question below. Remember that you can always get help from your generous personal tutor Sally!

How many candies does the candy man have in the box?

How do I measure the length with the box?

Well, you actually need to measure the box using the quarter.

You can start by measuring the width of the box.

Were you able to measure the width?

Yes

Do the numbers need to be the same?

Not necessarily! It is not a cube.

INTEGRATING CHATBOTS WITH ACTIVITIES

Sophia's Task

Now it's your turn to find how many candies the candy man had in the boxes on the picture below, write how many quarters fit along each of the width, height, and depth. Then answer the final question below. Remember that you can always get help from your generous personal tutor Sally!

How many candies does the candy man have in the box?

To be the same?

Not necessarily! It is not a cube.

Am I wrong?

No, your measurements are completely correct!

Yeah!

Remember that the box is half full.

So how many candies will you have?

405!

Perfect!

INTEGRATING CHATBOTS WITH READING

The Story of Tam and Cam

Long ago in a small village there lived a sweet, kind young girl named Tam. After her mother died, she and her father lived alone together for one day. Tam's father married again. His new wife was a widow who also had a young daughter, named Cam. For a few years, the four of them lived together peacefully. But when her father passed away, everything changed for Tam. Tam's stepmother was mean and selfish. She denied Cam her friend and... about your Tam. All day long, Tam watered the massive man and harvested golden peas while Cam chased butterflies and picked wild flowers.

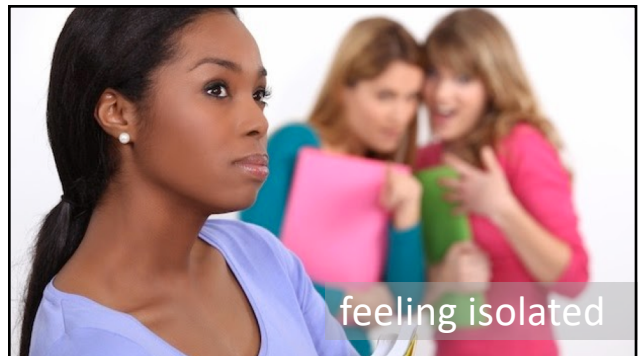
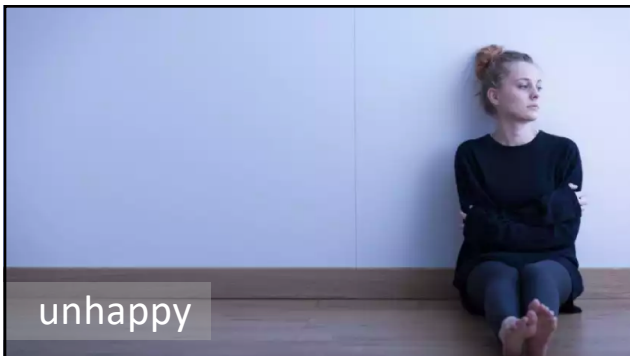
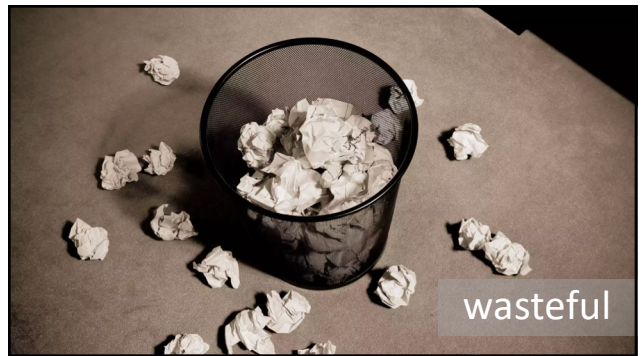
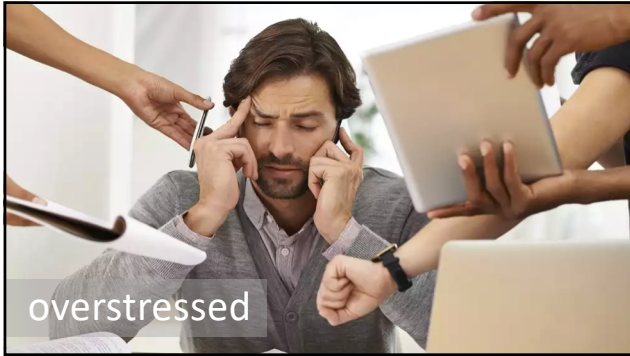
Why did the stepmother abuse Tam?

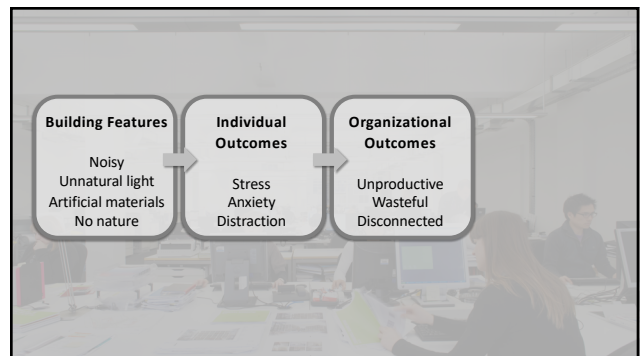
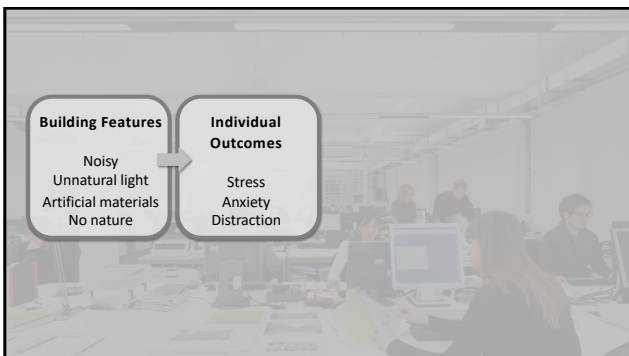
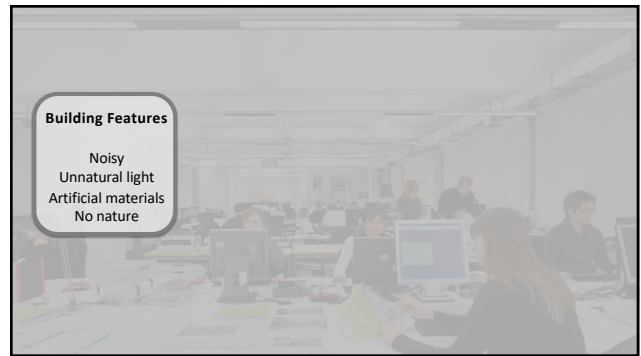
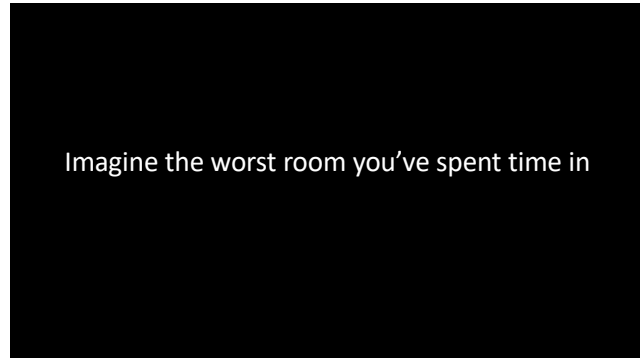
Because she was mean and selfish.

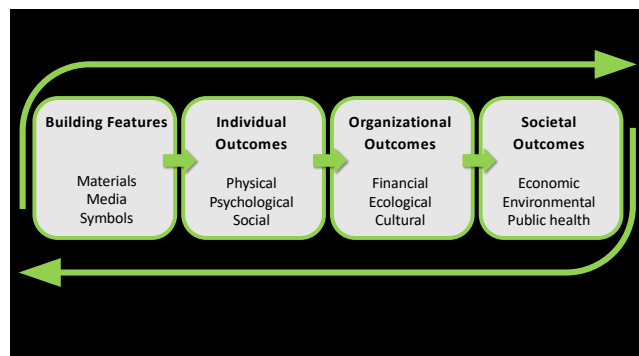
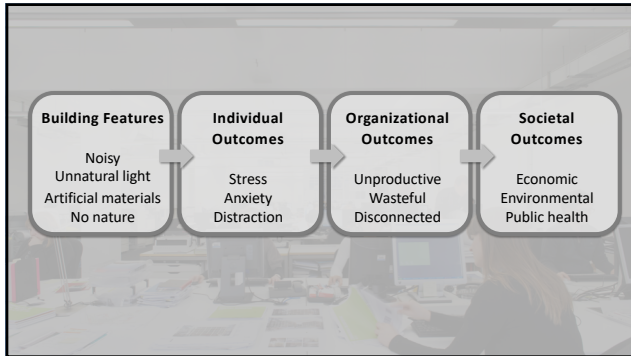
What does widow mean?

It means a woman whose husband dies.

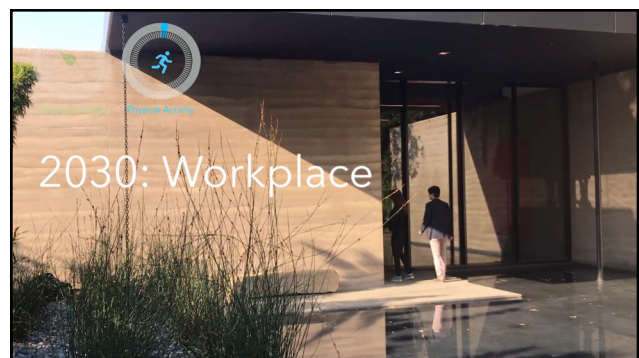
Chat with Phoenix

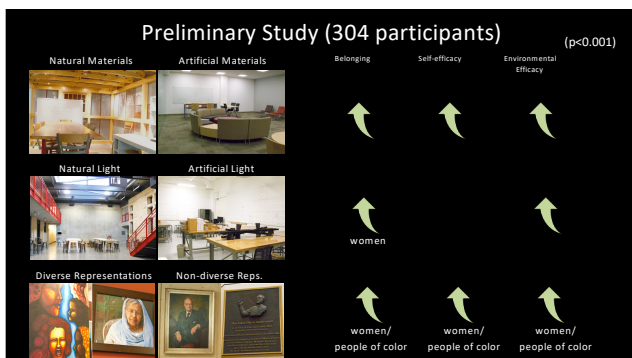
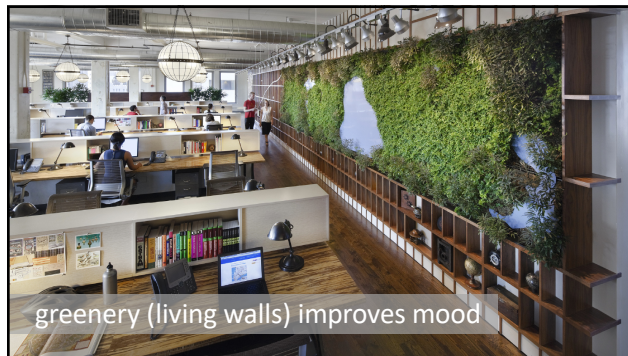
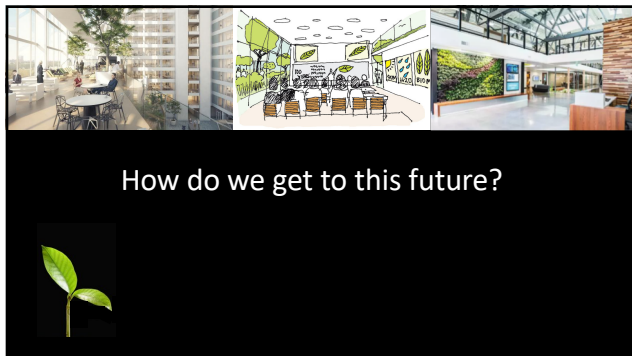






"We shape our buildings;
 thereafter *they shape us.*"
 – Winston Churchill





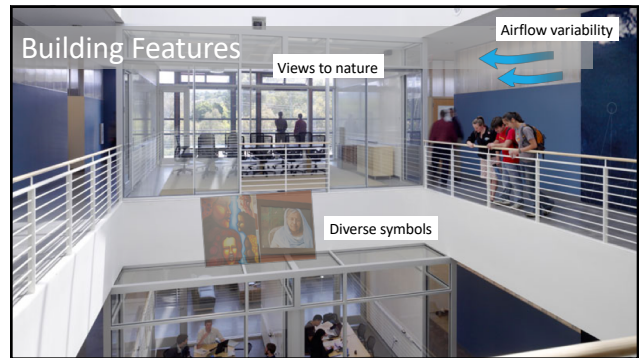
How Can Our Buildings Support Wellbeing?

“When you cannot **measure it**...you have scarcely advanced to the stage of *science*.”
- Lord Kelvin

How Can Our Buildings Support Wellbeing?

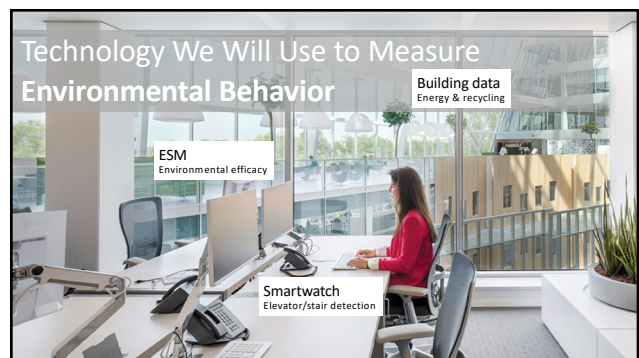
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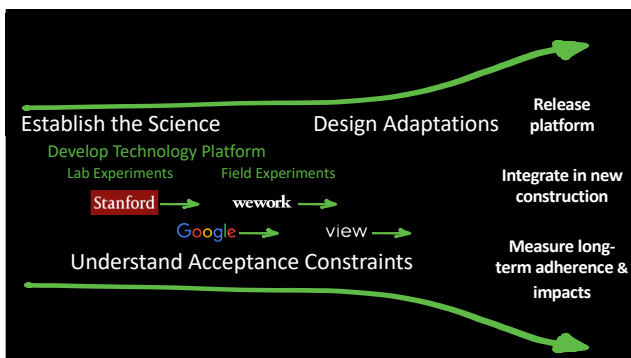
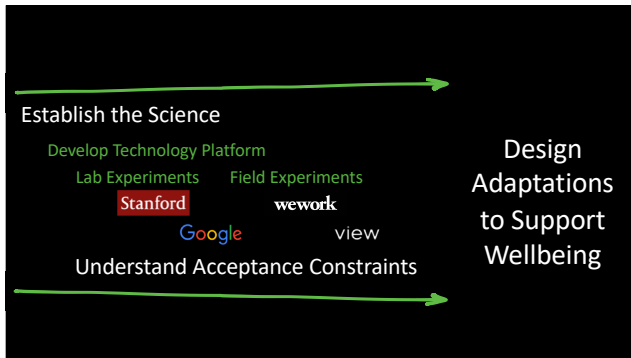
Establish the Science Understand Acceptance Design Adaptations
 • Technology Constraints
 • Experiments



Measuring Wellbeing Outcomes

	Personal Devices Phones Wearables Computers	
Building Data Occupancy Temperature Air flow / quality Water / energy use Recycling / waste	Outcomes Stress Belonging Creativity Physical Activity Environmental Behavior	Self-Report Experience-Sampling Method (ESM)





- ### ADMINISTRIVIA
- Landay Friday office hours moved to 2:30 pm this week
 - Midterm regrade requests due by 5 PM today (Wed)
 - Final versions of posters & pitch slide due today
 - need to get posters to the printer so you can get back in time (usually 24 hours required)
 - pitch slides go in a google slides deck that TAs will share (see Piazza). It needs to be final by Thursday as we will download as PPT
 - <http://bit.ly/cs147au18pitches>
 - Project fair
 - arrive at 6 PM to set up (show starts at 6:30)
 - dress code: none, but recommend treating as if it were a job interview
 - Questions on project?

