



刘哲明

James A. Landay

Professor Computer Science

Co-Director HAI

@landay

CS147

November 19, 2025

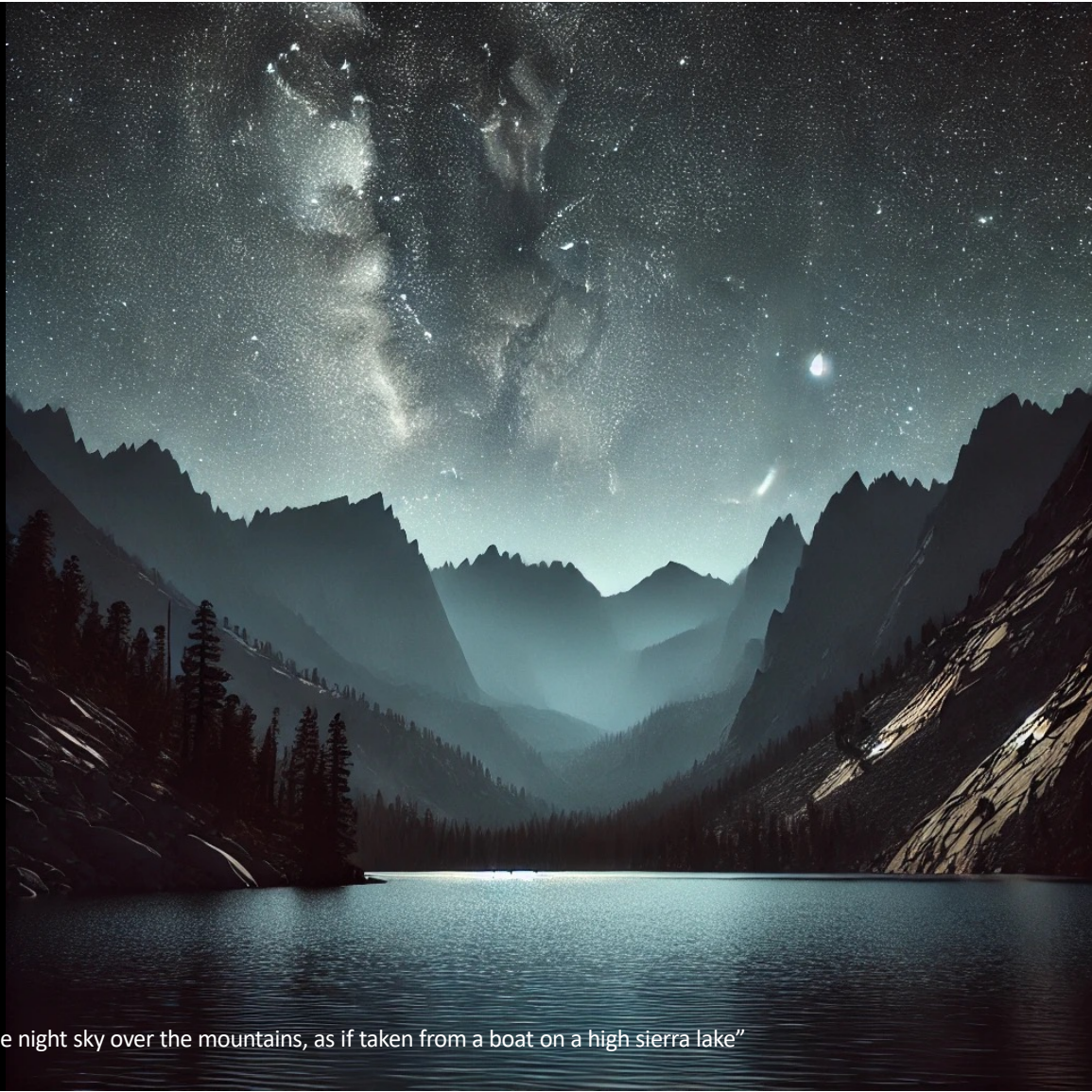
Stanford
University

THE MILKY WAY GALAXY



100-400 BILLION STARS





ChatGPT4 prompt: "photo of stars in the night sky over the mountains, as if taken from a boat on a high sierra lake"

A hand holding a purple highlighter over a document with a halftone pattern. The hand is positioned at the bottom center, with the highlighter tip pointing towards the left. The document is tilted and features a halftone pattern of small dots. Two teal beams of light converge on a small white diamond shape in the center of the image, with the text 'One model' on the left beam and 'One task' on the right beam.

One model

One task

FOUNDATION MODEL

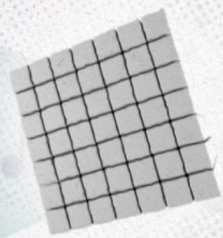
- Summarizing documents
- Generating stories
- Answering questions
- Writing code
- Solving math problems
- Synthesizing audio

+ MORE



IDEAS

DATA



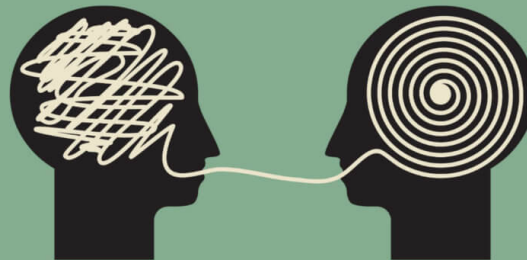
AI IS TAKING THE WORLD BY STORM

scientific discovery



Photo by Karen Arnott/EMBL-EBI
<https://scitechdaily.com/deepmind-ai-powers-major-scientific-breakthrough-alpha-fold-generates-3d-view-of-the-protein-universe/>

NLP



<https://singularityhub.com/wp-content/uploads/2018/03/AI-language-translation-artificial-intelligence-decoding-understanding-problem-face-explanation-208347706-900x500.jpg>

agents



Illustration by Kathleen Fu
<https://www.wsj.com/articles/managers-mistakes-artificial-intelligence-11667596940/>

GENERATIVE AI IS TAKING THE WORLD BY STORM



Here are some top-rated hotels in Kyoto, based on customer reviews:

1. The Ritz-Carlton Kyoto - This 5-star hotel is located in the heart of Kyoto's historic district and offers beautiful traditional Japanese-style rooms, an on-site spa, and a range of dining options.
2. The Tawaraya - This traditional Japanese ryokan is located in the heart of Kyoto and offers beautiful rooms and an on-site restaurant serving traditional Japanese cuisine.
3. The Four Seasons Hotel Kyoto - This luxurious hotel offers beautiful traditional Japanese-style rooms and a range of on-site amenities, including a spa and fitness center.
4. The Gion Hatanaka - This traditional Japanese inn is located in the Gion district, famous for its traditional machiya houses and geisha sightings. It offers comfortable rooms and a range of on-site amenities.
5. The Hiragiya - This traditional Japanese ryokan is located in the heart of Kyoto and offers beautiful rooms and an on-site restaurant serving traditional Japanese cuisine.

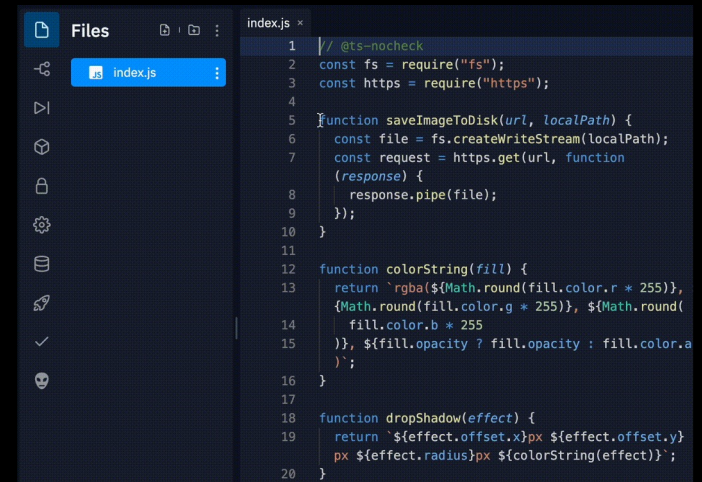
Here ■

ChatGPT



Midjourney

"Ben Stern's fashion photoshoot with decaying peonies as main theme"



```
index.js x
1 // @ts-nocheck
2 const fs = require("fs");
3 const https = require("https");
4
5 function saveImageToDisk(url, localPath) {
6   const file = fs.createWriteStream(localPath);
7   const request = https.get(url, function
8     (response) {
9     response.pipe(file);
10  });
11
12 function colorString(fill) {
13   return `rgba(${Math.round(fill.color.r * 255)},
14     ${Math.round(fill.color.g * 255)}, ${Math.round(
15     fill.color.b * 255
16   )}, ${fill.opacity ? fill.opacity : fill.color.a
17   });`;
18 }
19
20 function dropShadow(effect) {
21   return `${effect.offset.x}px ${effect.offset.y}
22     px ${effect.radius}px ${colorString(effect)};`
23 }
```

Copilot

Next evolution: Agentic AI — autonomous, goal-oriented & tool-using systems

MANIPULATING SOCIAL NETWORKS

Photo by cottonbro: <https://www.pexels.com/photo/a-sad-woman-looking-at-her-cellphone-while-sitting-on-a-bed-7341894/>



MANIPULATING SOCIAL NETWORKS



Eric Lee / Bloomberg via Getty Images file https://media-cldnry.s-nbcnews.com/image/upload/t_fit-1120w,f_auto,q_auto:best/rockcms/2022-06/220616-jan-6-riot-mi-1622-9fcfea.jpg

MANIPULATING SOCIAL NETWORKS



Sergio Lima | Afp | Getty Images | <https://www.cnn.com/2023/01/09/over-400-arrested-after-bolsonaro-supporters-storm-brazils-congress.html>

POLICIA MILITAR

ADDICTING PEOPLE TO GAMING



<https://www.healthygamer.gg/blog/how-to-help-your-teenager-overcome-video-game-addiction>

The New York Times

SIDEBAR

Sent to Prison by a Software Program's Secret Algorithms



Chief Justice John G. Roberts Jr., center, recently said that the day of using artificial intelligence in courtrooms was already here, "and it's putting a significant strain on how the judiciary goes about doing things." Stephen Crowley/The New York Times

By **Adam Liptak**
May 1, 2017

BIASED SENTENCING

PRO PUBLICA

Machine Bias

There's software used across the country to predict future criminals. And it's biased against blacks.

by Julia Angwin, Jeff Larson, Surya Mattu and Lauren Kirchner, ProPublica
May 23, 2016

IN A SPRING AFTERNOON IN 2014, Brisha Borden was running late to pick up her god-sister from school when

REPUTATIONAL HARM

The Washington Post
Democracy Dies in Darkness

Air Canada chatbot promised a discount. Now the airline has to pay it.

Air Canada argued the chatbot was a separate legal entity 'responsible for its own actions,' a Canadian tribunal said



By Kyle Melnick

February 18, 2024 at 8:35 p.m. EST



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News Opinion Sport Culture Lifestyle

World ▶ Europe US Americas Asia Australia Middle East Africa Inequality

Canada

This article is more than 1 month old

Air Canada ordered to pay customer who was misled by airline's chatbot

Company claimed its chatbot 'was responsible for its own actions' when giving wrong information about bereavement fare





Stanford University
Human-Centered
Artificial Intelligence

To advance AI **research**,
education, **policy** and
practice to improve the
human condition

AI development
must be guided
by its
human impact

Inspire new AI
technology by
human
intelligence

AI should
enhance &
augment humans,
not replace them



**AI SHOULD BE
GUIDED BY A
CONCERN FOR
ITS IMPACT ON
HUMAN SOCIETY**

**AI SHOULD BE
INSPIRED BY
HUMAN
INTELLIGENCE**



**AI SHOULD
AUGMENT,
NOT REPLACE,
HUMAN
CAPABILITIES**



RECOGNIZING THE IMPACT IS NOT ENOUGH



DALL-E prompt "A tech bro looks through a telescope as a massive asteroid hits the planet earth" -- extended with "city buildings"



EXPERTS USE AI IN AN IMPACTFUL AREA BUT OFTEN THE AI FAILS

☰ MIT Technology Review

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ARTIFICIAL INTELLIGENCE

Hundreds of AI tools have been built to catch covid. None of them helped.

Some have been used in hospitals, despite not being properly tested. But the pandemic could help make medical AI better.

By Will Douglas Heaven


July 30, 2021

EXPERTS USE AI IN AN IMPACTFUL AREA BUT OFTEN SOLVE THE WRONG PROBLEM

Q QUARTZ

FAULTY IMAGE

AI has a long way to go before doctors can trust it with your life



Job security.

By **Gary Smith & Jeffrey Funk**

Published June 4, 2021 • Last updated July 20, 2022

REUTERS/LUKE MACGREGOR

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The Guardian
News website of the year

News Opinion Sport Culture Lifestyle

UK World Climate crisis Newsletters Football Coronavirus Business



Skin cancer

AI skin cancer diagnoses risk being less accurate for dark skin - study

Research finds few image databases available to develop technology contain details on ethnicity or skin type

Nicola Davis *Science correspondent*

@NicolakSDavis
Tue 9 Nov 2021 18.30 EST

EXPERTS USE AI IN AN IMPACTFUL AREA
BUT OFTEN SOLVE THE **WRONG PROBLEM**



*“Will AI **replace** radiologists?”
is the **wrong** question...*

*The right answer is:
Radiologists who **use** AI will
replace radiologists who don't.*

— Curt Langlotz
Stanford Radiologist &
AI Researcher

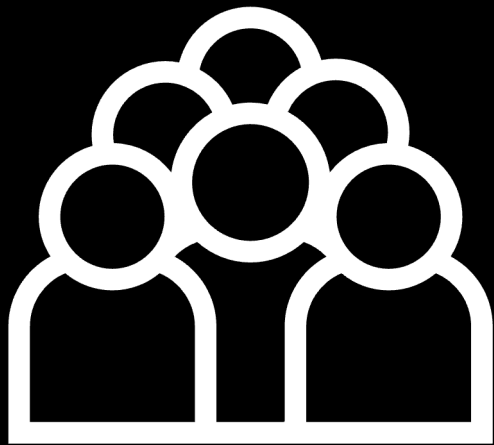
→ Human + Agent Collaboration

HUMAN-CENTERED AI

BETTER CHANCE OF CREATING
TECHNOLOGY WITH A POSITIVE IMPACT

WHAT IS HUMAN-CENTERED AI

who we study to



find problems

develop solutions

evaluate systems

people by [Anastasia Latysheva](#) from [Noun Project](#)


WHAT IS HUMAN-CENTERED AI

USER-CENTERED



DALL-E prompt "a person on the grass surrounded in a circle by many more people all surrounded by more grass"

WHAT IS HUMAN-CENTERED AI

A large crowd of people in a field, with a semi-transparent blue arch framing the scene. The people are dressed in various colorful clothing, and the field is filled with tall green grass. The overall scene is vibrant and busy.

COMMUNITY-CENTERED

DALL-E prompt "a person on the grass surrounded in a circle by many more people all surrounded by more grass"

An aerial photograph of a large crowd of people standing on a green grassy field. The people are wearing colorful clothing, primarily in shades of purple, blue, and pink. A thick teal arch is superimposed over the top of the image, framing the scene. A semi-transparent horizontal band is overlaid across the middle of the image, containing the text "SOCIETY-CENTERED" in a black, spaced-out, sans-serif font.

SOCIETY-CENTERED

DALL-E prompt "photorealistic image of 1000 more people standing on grass"

INTERDISCIPLINARY TEAMS

* FROM THE START



Photo by fauxels: <https://www.pexels.com/photo/colleagues-shaking-each-other-s-hands-3184291/>

HUMAN-CENTERED AI AUTONOMOUS CARS

SOCIETY-
CENTERED

COMMUNITY-
CENTERED

USER-
CENTERED



Autonomous Agent

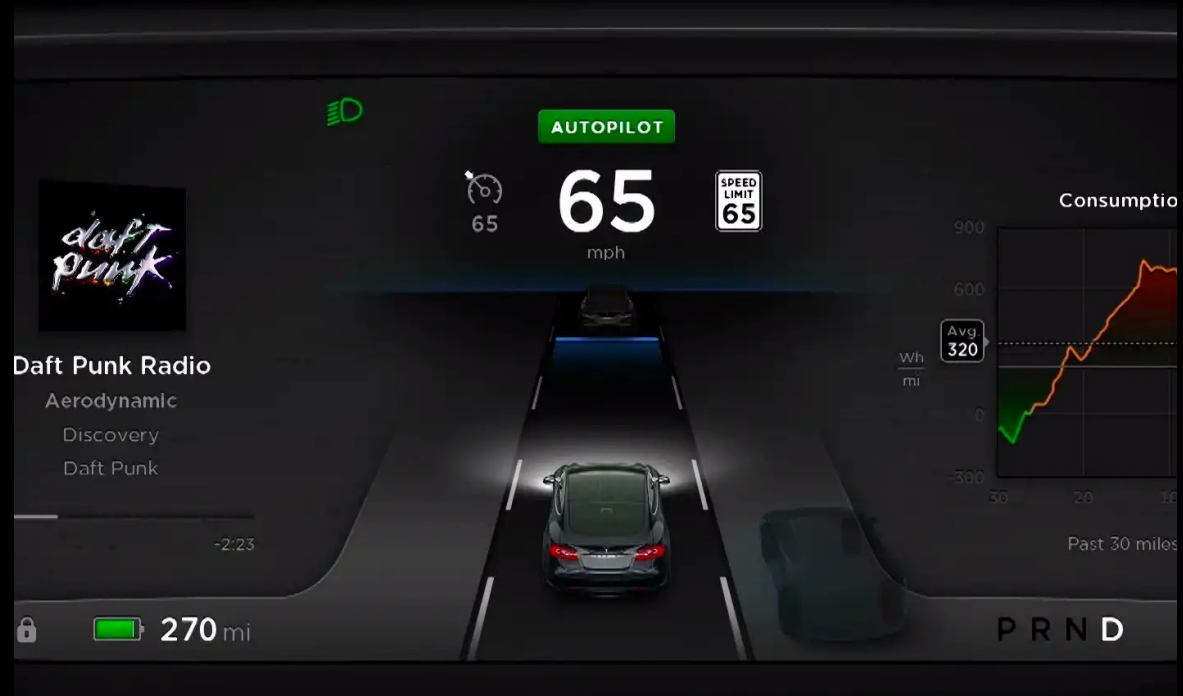
● Driver

HUMAN-CENTERED AI AUTONOMOUS CARS

SOCIETY-
CENTERED

COMMUNITY-
CENTERED

USER-
CENTERED



● Driver

HUMAN-CENTERED AI AUTONOMOUS CARS

 [NEWS](#) [CARS](#) [MOTO](#) [DRIVEN](#) [CLASSICS](#) [RENDERINGS](#) [SPYSHOTS](#) [EV/HYBRID](#) [MOTORSPORT](#)

Home > News > U-turn > **CRUISE**

Over a Dozen Robotaxis Cause Massive Traffic Jam in Austin

Published: 24 Sep 2023, 09:43 UTC • By: [Elena Luchian](#) 



Drivers of other autonomous & non-autonomous cars, pedestrians, bicyclists, etc.

Driver

HUMAN-CENTERED AI AUTONOMOUS CARS

≡ FORTUNE

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TECH · SELF-DRIVING CAR

One of the most important features of self-driving cars can fail to spot pedestrians at night, warns auto insurance watchdog

BY TRISTAN BOVE

August 30, 2022 at 3:47 AM PDT



Drivers of other autonomous & non-autonomous cars, pedestrians, bicyclists, etc.

Driver

HUMAN-CENTERED AI AUTONOMOUS CARS

SOCIETY-
CENTERED

- A city or region

COMMUNITY-
CENTERED

USER-
CENTERED



The screenshot shows the homepage of 'THE DAILY TEXAN' with a navigation menu, search icon, and a sports banner for 'PBR FRIDAY OCTOBER 7'. Below the banner are 'News' and 'Research' tabs. The main article is titled 'UT researchers find how autonomous car features can offset road safety' by Rylie Lillibridge, dated August 20, 2022. The article text begins with 'The growing prevalence of autonomous features in cars has the potential to reduce...'. An illustration of a blue car with sensor waves is shown on the right.

THE DAILY TEXAN

Serving The University Of Texas At Austin Community Since 1900

PBR
FRIDAY
OCTOBER 7
THE RIVALRY CONTINUES
TEXAS
VARSITY
OKLAHOMA
• STONEY LARUE
CONCERT
BUY NOW!

\$10 STUDENT TICKET! 🗝️ Unlock CODE: BEATOU

News Research

UT researchers find how autonomous car features can offset road safety

[Rylie Lillibridge](#), News Reporter
August 20, 2022

The growing prevalence of autonomous features in cars has the potential to reduce...



HUMAN-CENTERED AI *AUTONOMOUS CARS*

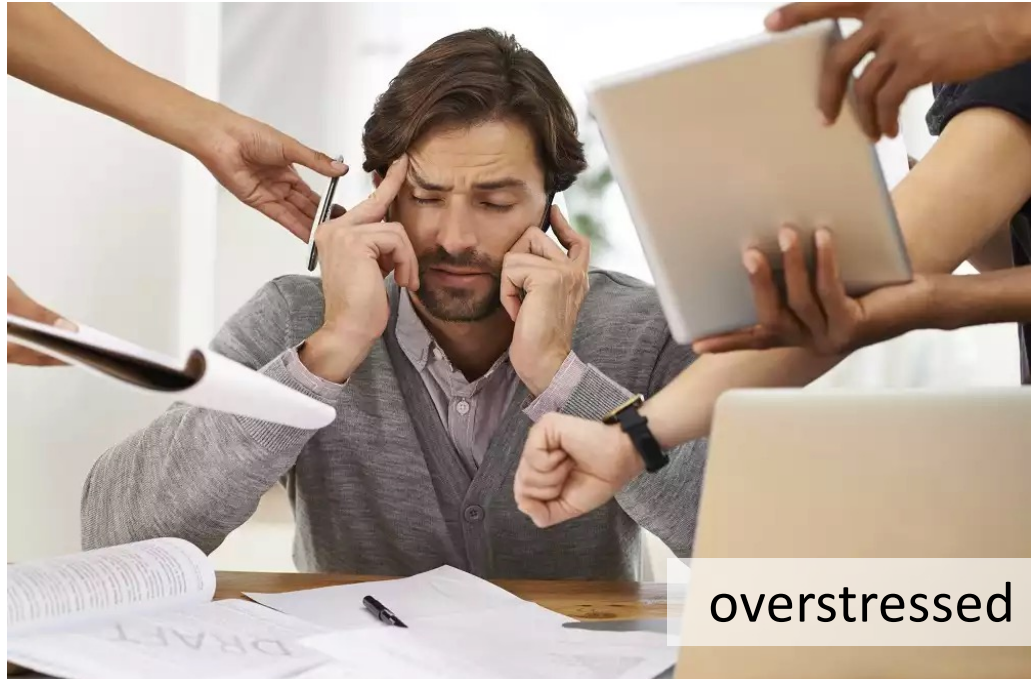
SOCIETY-
CENTERED

- A city or region

BUILD BETTER PUBLIC TRANSIT INSTEAD?

COMMUNITY-
CENTERED

USER-
CENTERED



overstressed



sedentary



uninspired



wasteful



isolated

WE SPEND 87% OF OUR TIME INSIDE BUILDINGS



<http://snowbrains.com/wp-content/uploads/2014/06/Sad-love-sad-boy-alone-man-alone-in-dark-black-room-looking-out-from-window.jpg>

AWARENESS THAT BUILDINGS IMPACT WELLNESS

B B

FUTU

The h

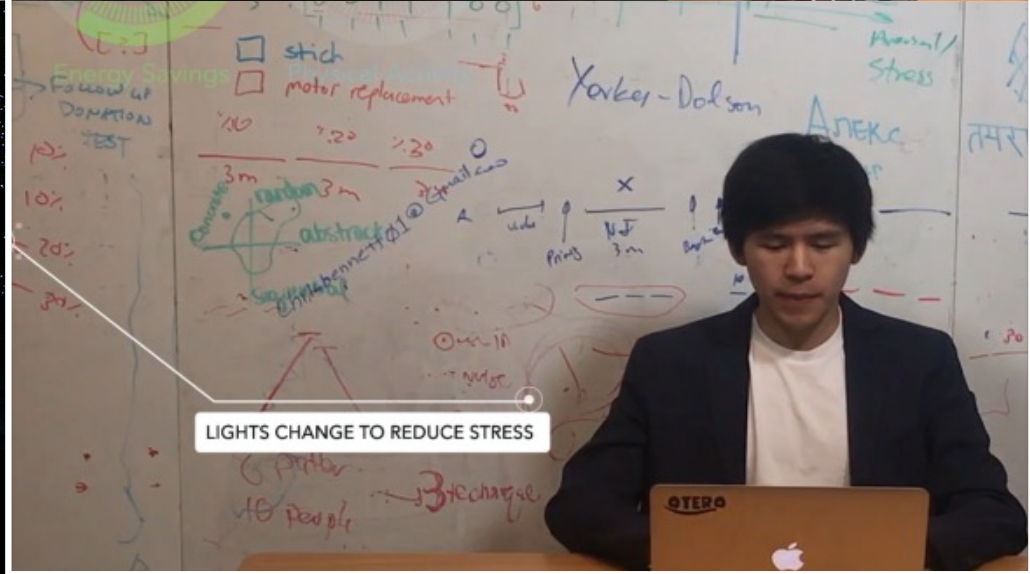
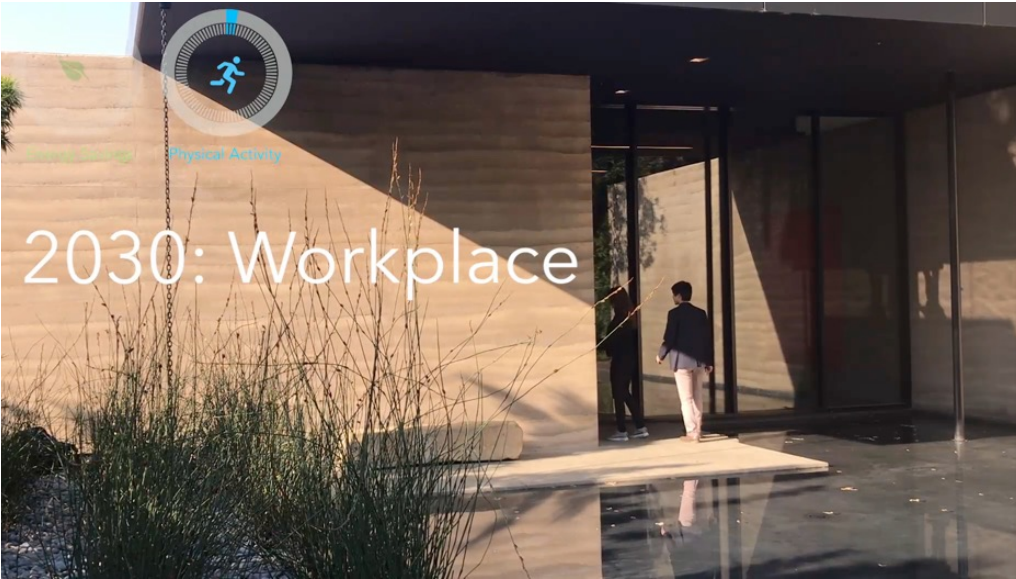
Health and Wellness in
Buildings: Addressing
Challenges Now
and in the Future

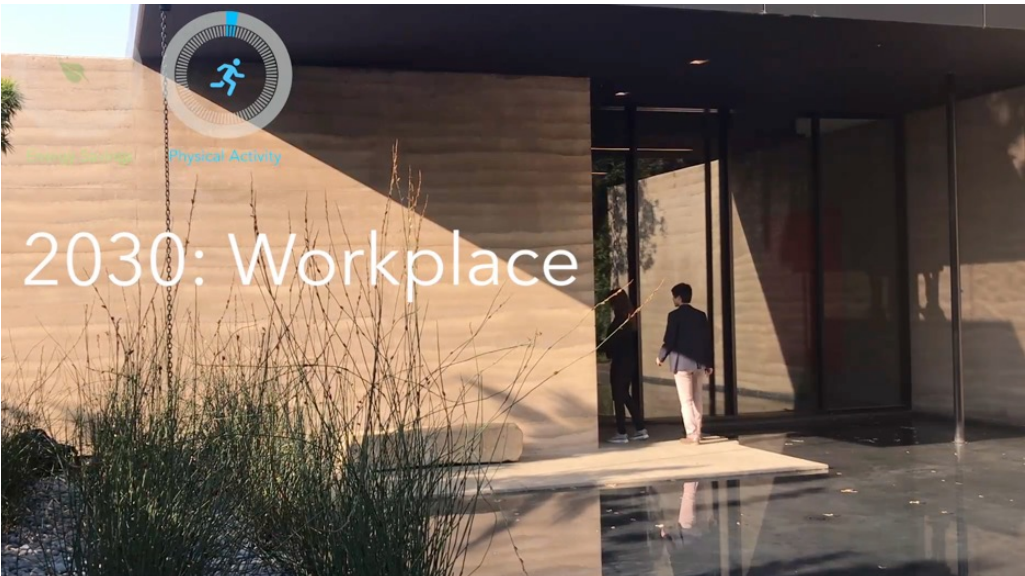
Strategies for optimizing building health



More 

u feel





Physical Activity

2030: Workplace



NATURAL SCENERY REDUCES STRESS

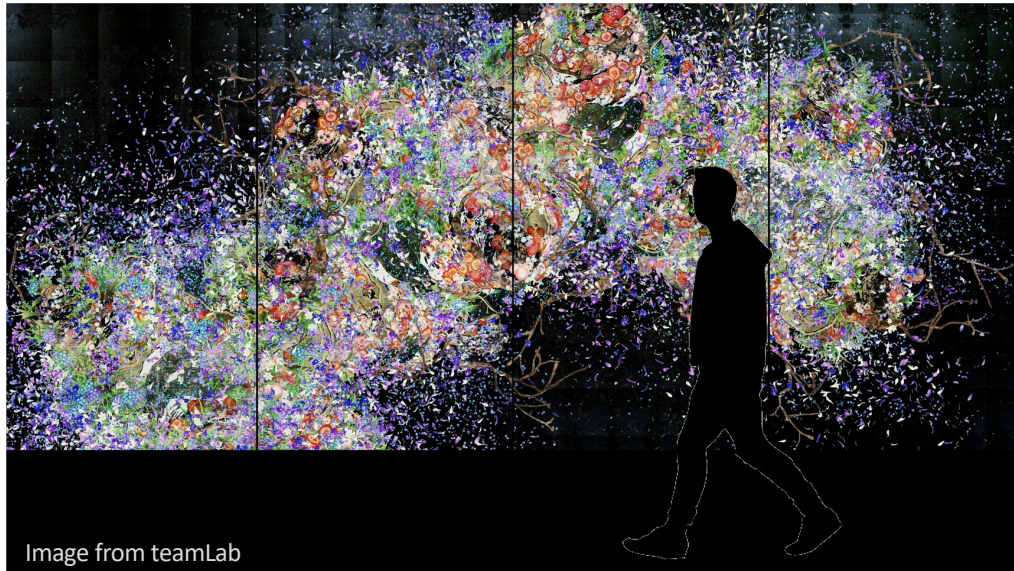
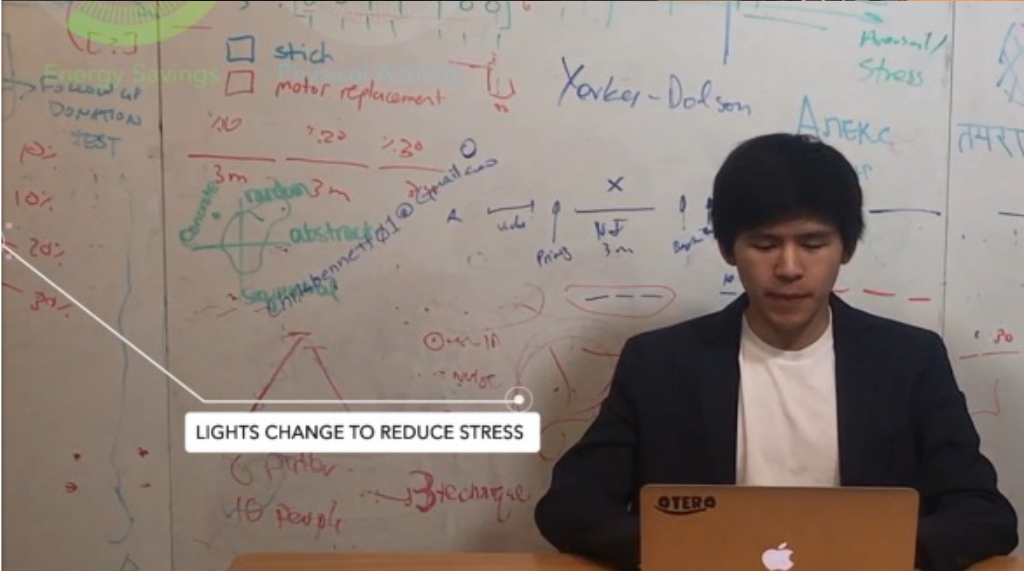


Image from teamLab

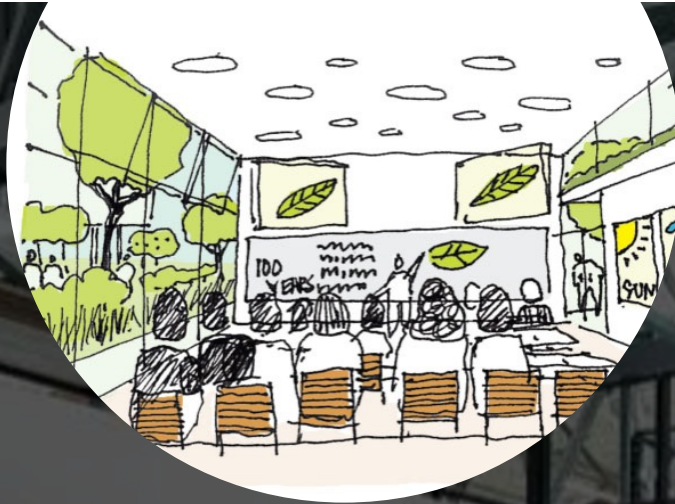


LIGHTS CHANGE TO REDUCE STRESS

How do we get to this future?



How do we get to this future?



CONTROLLED LAB STUDY (N=412)

2x2x2 conditions

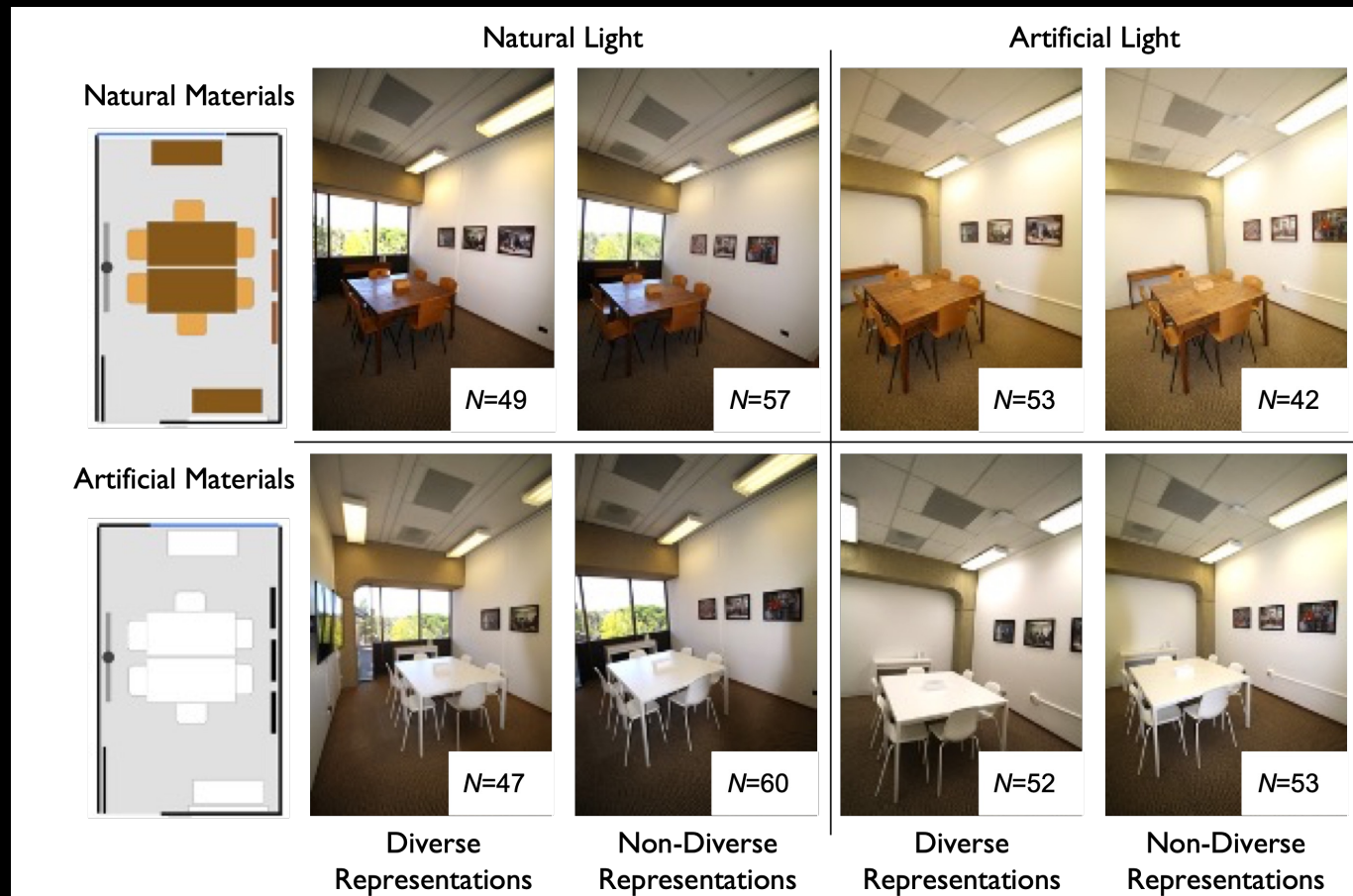
natural vs.
artificial materials

x

natural vs.
artificial light

x

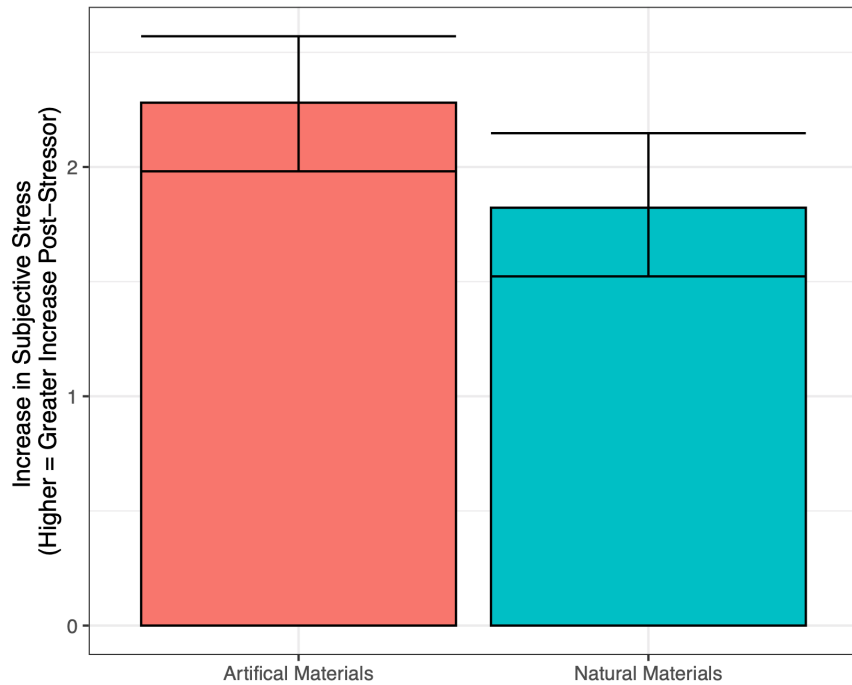
diverse vs.
non-diverse
representations



Douglas, et al.,
Building and Environment,
Volume 224,
2022.

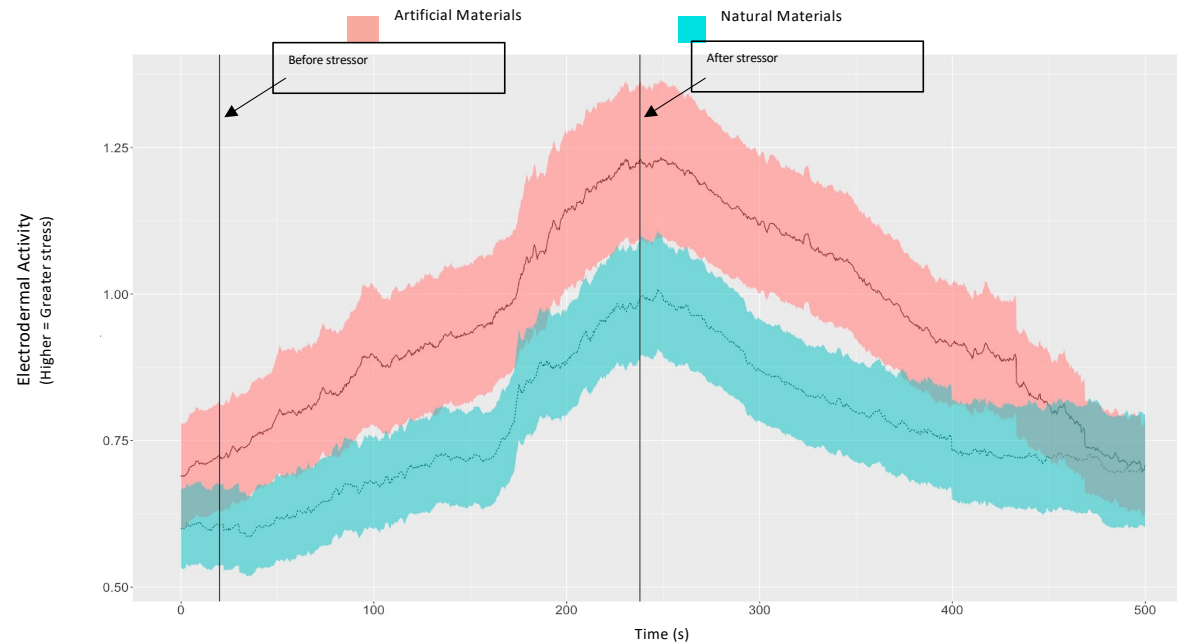
NATURAL MATERIALS & WINDOWS DECREASED STRESS

Natural Materials Buffer Subjective Stress Response



self-report

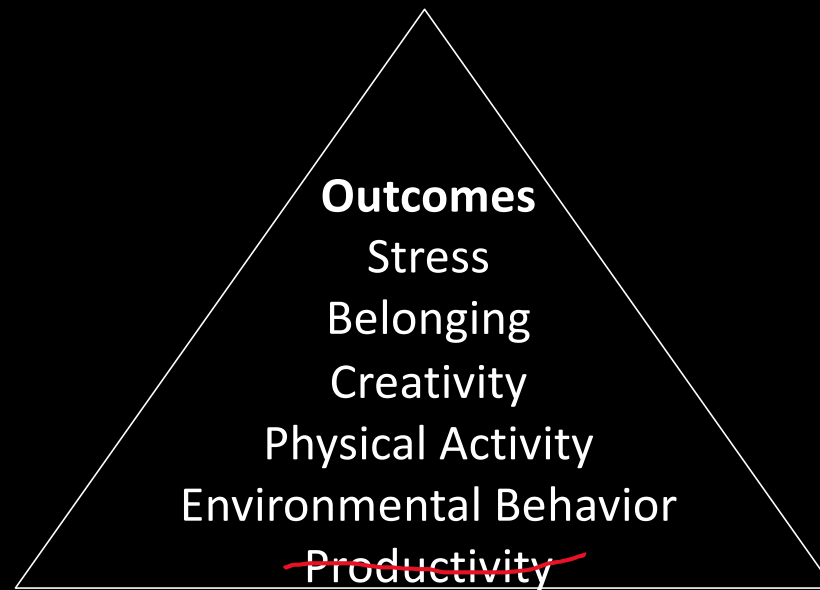
Natural Materials Buffer Physiological Stress Response



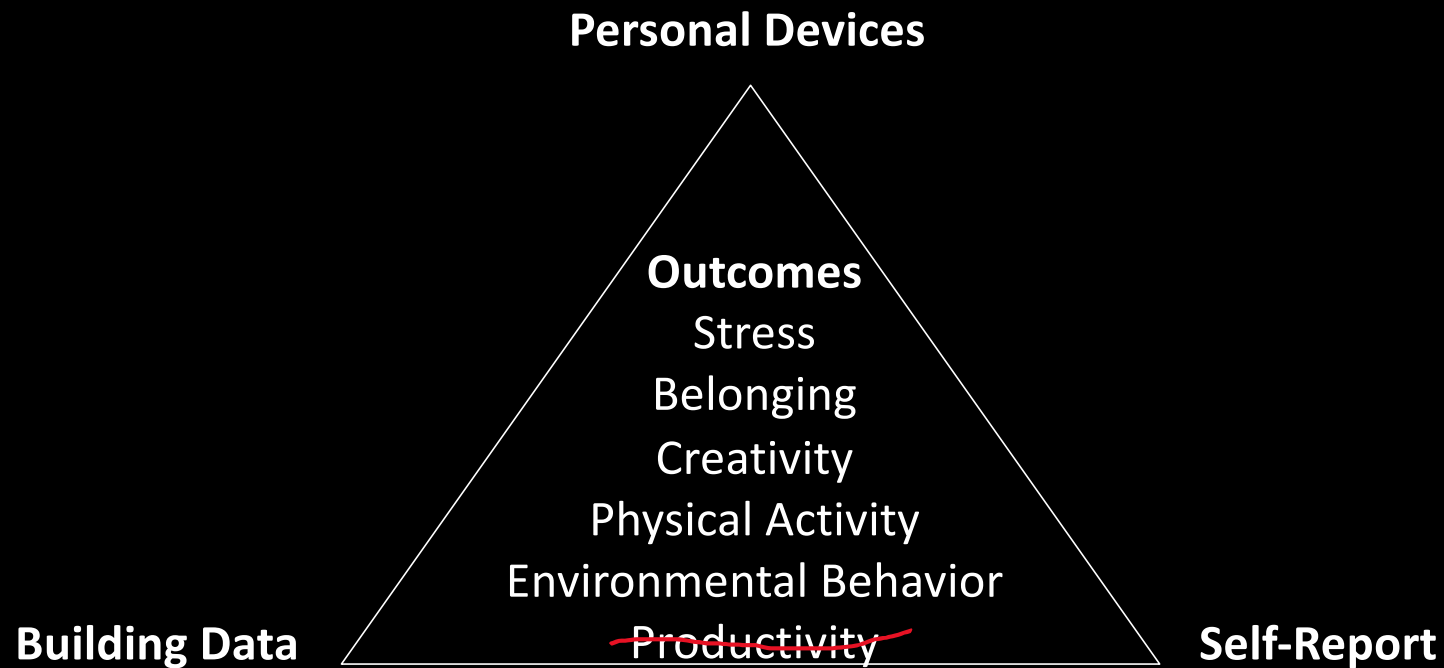
EDA sensed

Douglas, et al.,
Building and Environment,
Volume 224,
2022

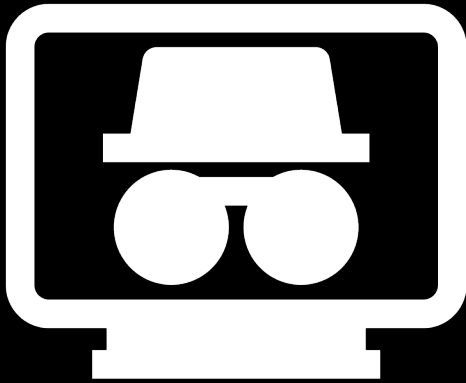
AI TO MEASURE WELLBEING OUTCOMES



AI TO MEASURE WELLBEING OUTCOMES



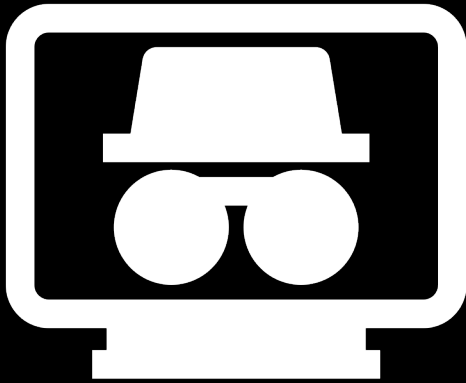
PRIVACY RESEARCH IS ESSENTIAL



User concern over data collection
& data security is legitimate

- Mixed methods assessments w/ stakeholders
- All studies are opt-in
- **Security**

PRIVACY RESEARCH IS ESSENTIAL



User concern over data collection
& data security is legitimate

- Mixed methods assessments w/ stakeholders
- All studies are opt-in
- Security

... BUT THIS IS ONLY **USER-CENTERED**

How do we communicate what
is going on in a smart space?



I Agree. Dima Yarovinsky, 2018

How do we communicate what is going on in a smart space?

IMPLICATION DESIGN

embedding a product's ethical
implications into its design

Communicating



Eyecam is a webcam shaped like a human eye. It can see, blink, look around and observe you.

Teyssier et al., 2021

Protecting



Alias is a teachable “parasite” that is designed to give users more control over their smart assistants, both when it comes to customization and privacy. When you don't use it, Alias will make sure the assistant is paralyzed and unable to listen by interrupting its microphones.

Project Alias. Bjørn Karmann & Tore Knudsen, 2018

DESIGN WORKSHOP

Diverse set of participants engaging in collective speculation

Lightweight format

- 1) Anticipation Round produces a deck of cards
- 2) Implication Design Round practice implication design
- 3) Action Round uses card deck to play a role-playing game



DESIGNING ETHICAL TECHNOLOGY WITH OLDER ADULTS



Group 1



Group 2



Group 3

SCENARIO

Imagine having a device that can speak with you the same way humans can.

It has been programmed by your doctor to ask questions related to your health and wellbeing.

It learns as much as it can about you and provides that information to your doctor so they can adapt your care.

It also makes recommendations personalized to your needs, and serves as a companion, actively listening to anything you want to tell it.



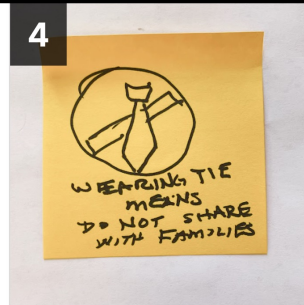
Wrist cuffs with authentication (P1)



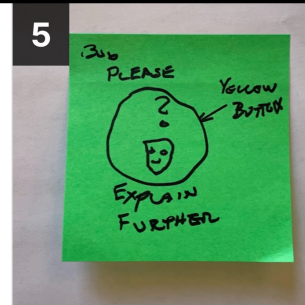
Way to unravel data on screen (P1)



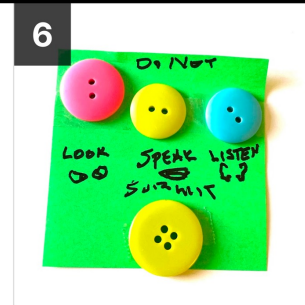
Data filter (P1)



Privacy tie (P2)



Button for data explanation (P2)



Privacy buttons (P2)



Content filter (P3)



Anti-hacking necklace (P3)



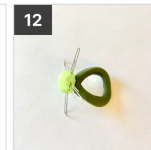
Biometric necklace keyed to thumbprint (P3)



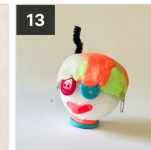
Dynamically generated resources (P4)



Handheld video call device (P4)



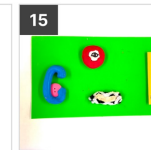
Voice-activated ring to protect data (P4)



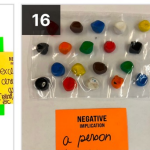
Anti-hacking helmet (P5)



Affordable device with activities (P5)



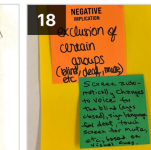
Inclusive device (P5)



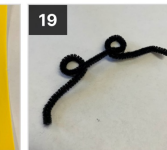
Buttons with activities and alerts (P5)



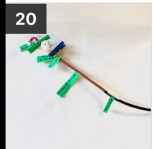
Implant and necklace for unsheltered (P6)



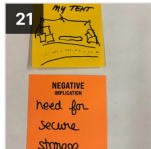
Disability-adaptive screen (P6)



Invisibility mustache (P6)



Hacking pipeline (P6)



Storage tent (P7)



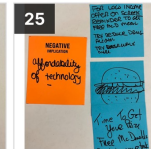
Indicator of caregiver stealing (P7)



Glasses with camera and brain implant (P7)



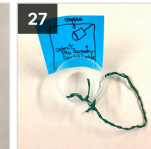
Reminder of available services (P8)



Reminder of available discounts (P8)



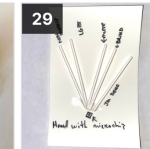
Dashboard of community services (P8)



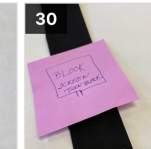
Camera to track caregivers stealing (P8)



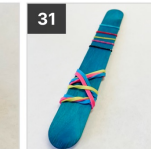
Brain linked to the bionic hand (P8)



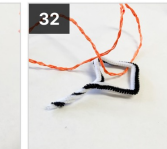
Bionic hand connected to the brain (P8)



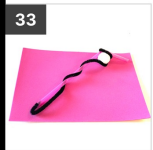
Privacy screen (P9)



Hack-proof credit card chip (P9)



Hack-proof key (P9)



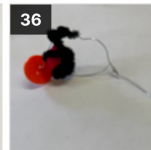
Indicates dead-ends in cruise ship (P9)



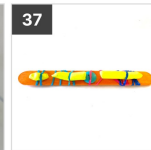
"Buddy" blocking negative information (P10)



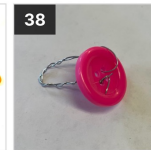
Earpiece that stops the technology (P10)



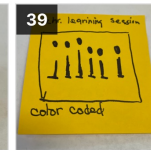
Earbud and mic to call protector (P11)



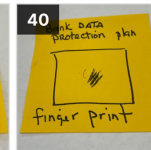
Ship dashboard (P11)



Anti-theft purse charm (P11)



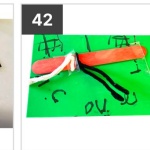
Beeps indicating computer crash (P11)



Fingerprint lock (P11)



Glasses that enable invisibility (P13)



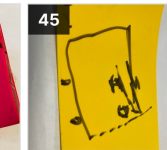
Laughter indicator to find fun (P13)



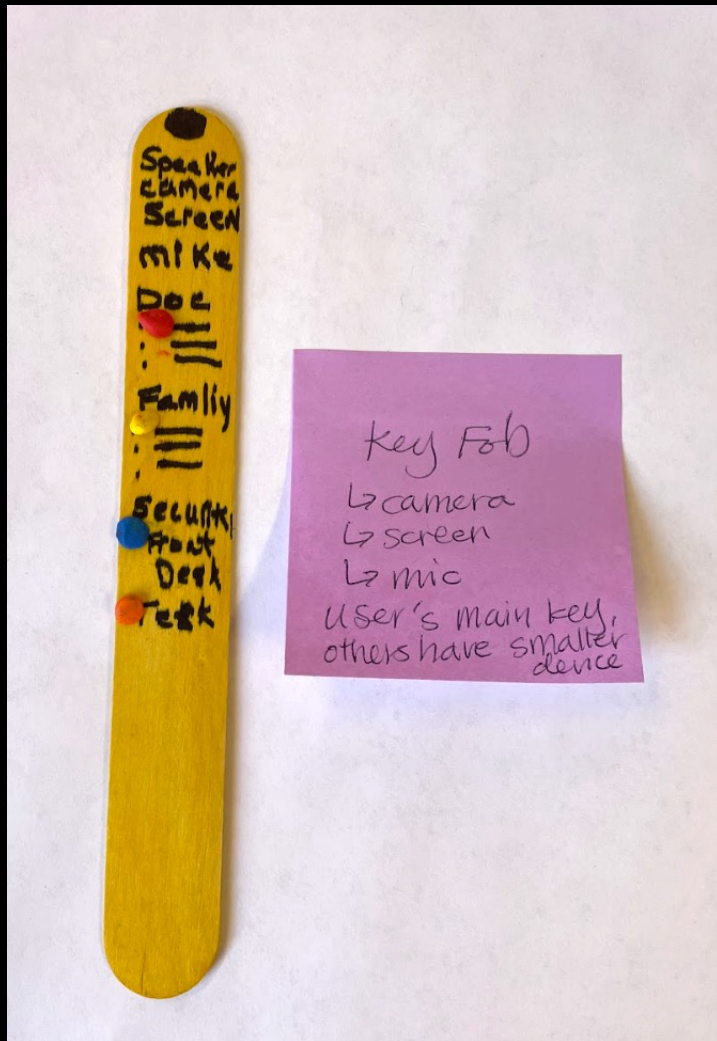
Verbal indication of computer crash (P13)



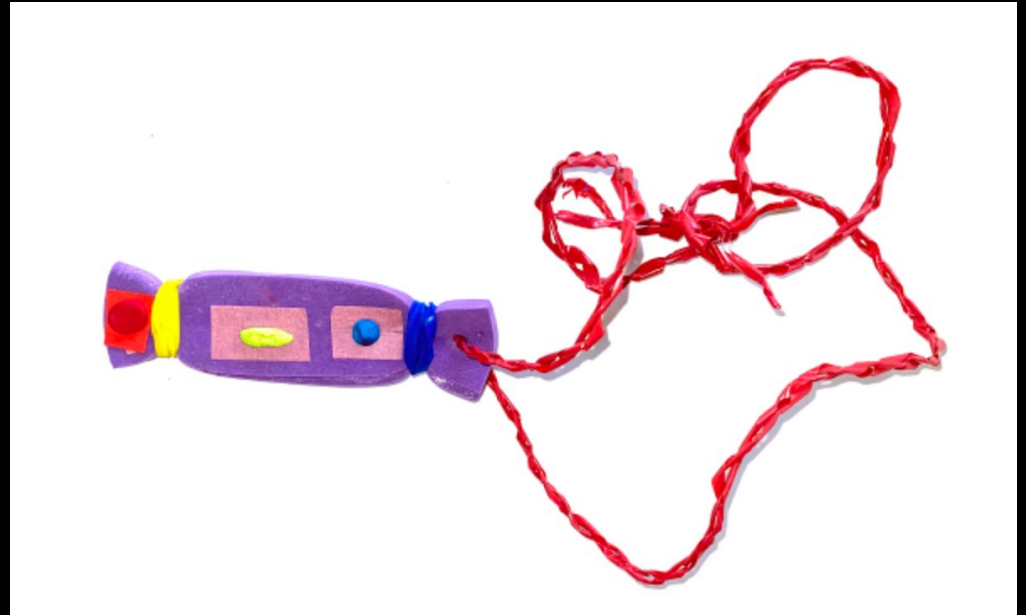
Scan-proof wallet (P13)



Scrambled screen to prevent identity theft (P13)



“The main doctor could have some things on the screen.. a nurse ... [would] also have access ability ... and then the other one would be like the security in your building. They would have a different level of interaction and family and then friends like and all your senior friends, junior club or whatever. But it would have a variable of security.”



“If there's a problem, then you can press the buttons. Blue button: if you are panicking, you can press blue button and it will regulate your breathing, relax/calm down. Red: stop everything. Yellow: resume life.”

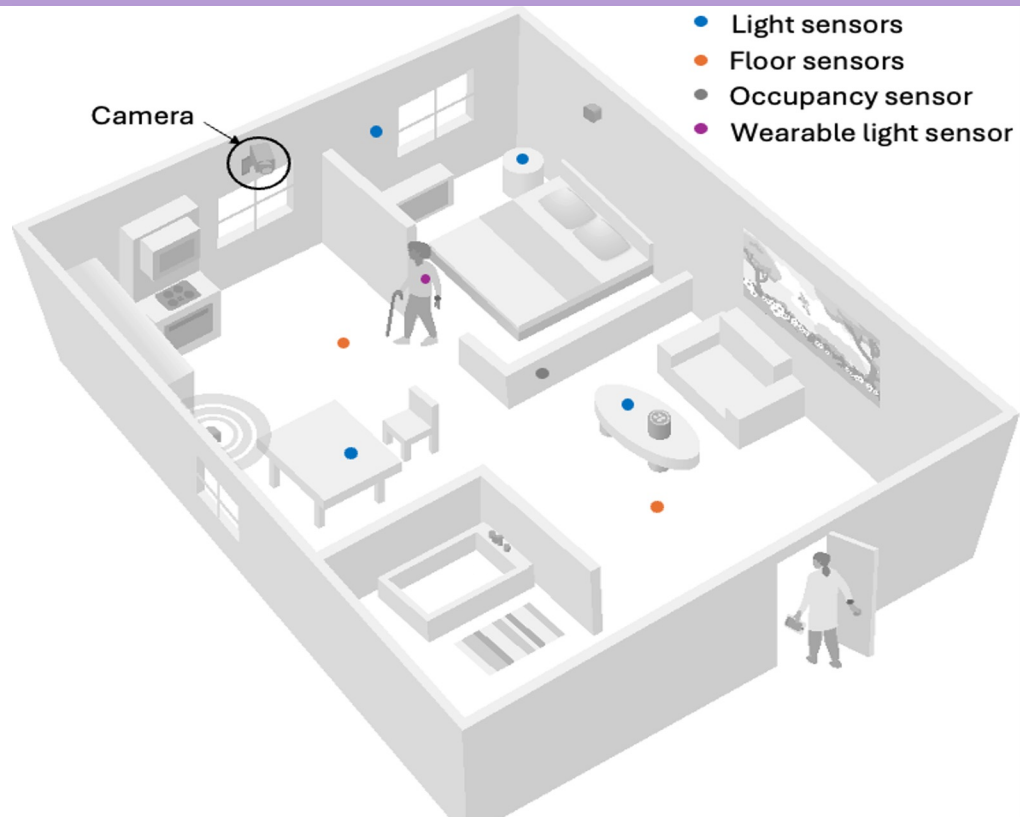
“Detecting device in the doorway so a caregiver that might be taking advantage can be caught. Doorway device detects how much money you have in case a caregiver steals money, so if a caregiver leaves with more money than they came with, it will stop them. Also detects chips on your credit card to see how many credit cards you entered and left with.”



A photograph showing a healthcare worker in blue scrubs and a stethoscope assisting an elderly man with a walker. The man is wearing a plaid shirt and jeans. The healthcare worker is smiling and holding the walker's handle. The scene is set in a bright, indoor environment, possibly a home or a care facility. A semi-transparent red banner is overlaid across the middle of the image, containing white text.

SURGE IN OLDER ADULTS REQUIRING CARE
WITHOUT NECESSARY LABOR RESOURCES

AMBIENT INTELLIGENCE TO HELP OLDER ADULTS AGE IN PLACE WHILE UPSKILLING PERSONAL HEALTH AIDES



HUMAN-CENTERED AI

HYBRID PHYSICAL-DIGITAL SPACES

SOCIETY-CENTERED

Privilege—who has access to these fancy buildings

- People with invisible disabilities or marginalized identities that they don't wish to disclose;

COMMUNITY-CENTERED

Anyone who comes into a building (e.g., delivery people, visitors) or food vendors working outside

-

USER-CENTERED

Building residents, management...

-

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Stanford University
Human-Centered
Artificial Intelligence

“AI FOR GOOD” *ISN’T* GOOD ENOUGH: A CALL FOR HUMAN-CENTERED AI

刘哲明

James A. Landay

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Exit Ticket

hci.st/cs147-25au-exit-9-345

