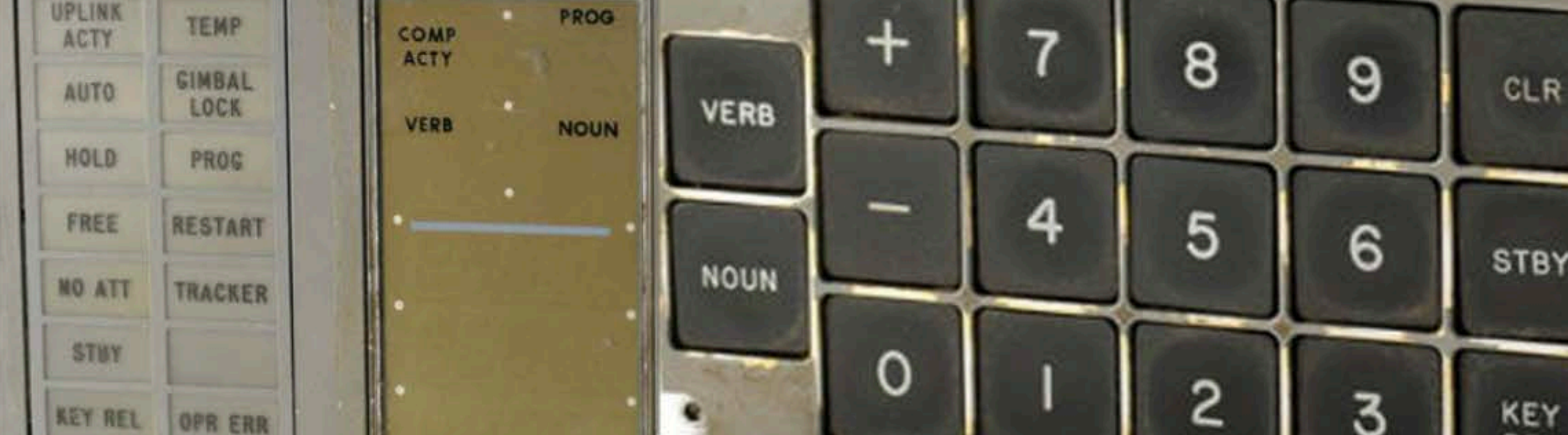


**CS160**

**USER INTERFACE DESIGN**

**FALL 2020**



# **DATA ANALYSIS**

21 OCT 2020

**ERIC PAULOS**

[www.paulos.net](http://www.paulos.net)

UNIVERSITY OF CALIFORNIA



**Berkeley**

# ANNOUNCEMENTS

Thank you for feedback

PROG 02 Extension

**VOTE! (Of course)**

Teams

FEED 04: Feedback on Ideas (due 26 Oct ▪ Monday)

DESIGN 06: Understanding Users and Competitive Analysis (due 30 Oct)

DESIGN 07: Low-Fidelity Prototype (due 2 Nov)

DESIGN 08: Low-Fidelity Feedback (Due 12 Nov)

DESIGN 09: Coding Towards High-Fidelity (Due 23 Nov)

# ANNOUNCEMENTS

## **THIS WEEK:**

Identify people to interview

Schedule interviews

Develop interview script

Start competitive analysis – identify applications to use for comparison

Discuss and identify tasks your application will likely support

## **NEXT WEEK:**

Select 3 primary tasks you will wireframe

Work on wireframes in Figma

Complete interviews

Identify Google Cloud API that suits your application (familiarize yourself with its operation)

HAND-IN DESIGN 06 (FRI)

## **31 OCT**

Trick or Treat! Put on your Halloween costume and dance around your home! Boo! Be safe!

# ANNOUNCEMENTS

## **By MONDAY 2 NOV:**

Come to class MON we have an amazing HCI Career panel

Finish video of wireframe walkthrough of tasks

HAND-IN DESIGN 07 (MON)

## **TUE 3 NOV:**

MAKE SURE YOU VOTED!!!

## **WED 4 NOV**

No Class

# ANNOUNCEMENTS

## WEEK OF 9 OCT

Start making a plan for coding and APIs to use

Schedule and receive feedback on your design

Review and provided feedback on 3 other team's designs

Start moving designs into Android for one primary task

HAND-IN DESIGN 08 (THUR)

## WEEK OF 16 OCT

Coding and getting Google Cloud API to function

HAND-IN DESIGN 09 (Mon 23 NOV)

More details to follow around final deliverables soon



# MANAGING STUDY PARTICIPANTS

# RUN THE EXPERIMENT

Always pilot it first!

Reveals unexpected problems

Can't change experiment design after starting it

Always follow same steps – use a checklist

Get consent from subjects

Debrief subjects afterwards

# THE PARTICIPANTS' STANDPOINT

Testing is a distressing experience

Pressure to perform

Feeling of inadequacy

Looking like a fool in front of  
your peers, your boss, ...



(from "Paper Prototyping" by Snyder)



# THE THREE BELMONT PRINCIPLES

## Respect for Persons

Have a meaningful consent process: give information, and let prospective subjects freely chose to participate

## Beneficence

Minimize the risk of harm to subjects, maximize potential benefits

## Justice

Use fair procedures to select subjects

Burdens and benefits shared equitably

(balance burdens & benefits)

To ensure adherence to principles, most schools require Institutional Review Board approval of research involving human subjects.

# THE THREE BELMONT PRINCIPLES

## Respect for persons

protecting the autonomy of all people and treating them with courtesy and respect and allowing for informed consent. Researchers must be truthful and conduct no deception

## Beneficence

The philosophy of “Do no harm” while maximizing benefits for the research project and minimizing risks to the research subjects

## Justice

ensuring reasonable, non-exploitative, and well-considered procedures are administered fairly — the fair distribution of costs and benefits to potential research participants — and equally.

# **RESPECT FOR PERSONS**

**Treat individuals as autonomous agents**

**Persons with diminished autonomy are entitled to protection**

## **Applications**

Participation should be voluntary

Participants should be fully informed of the costs and benefits of participation

# **BENEFICENCE**

**Do not harm**

**Maximize the possible benefits and minimize the possible harms**

## **Applications**

Systematic analysis of the risks and benefits of the research to both the individual and to society at large

# JUSTICE

## Who should bear the burdens of research and who should receive the benefits?

To each person an equal share

To each person according to individual need

To each person according to individual effort

To each person according to societal contribution

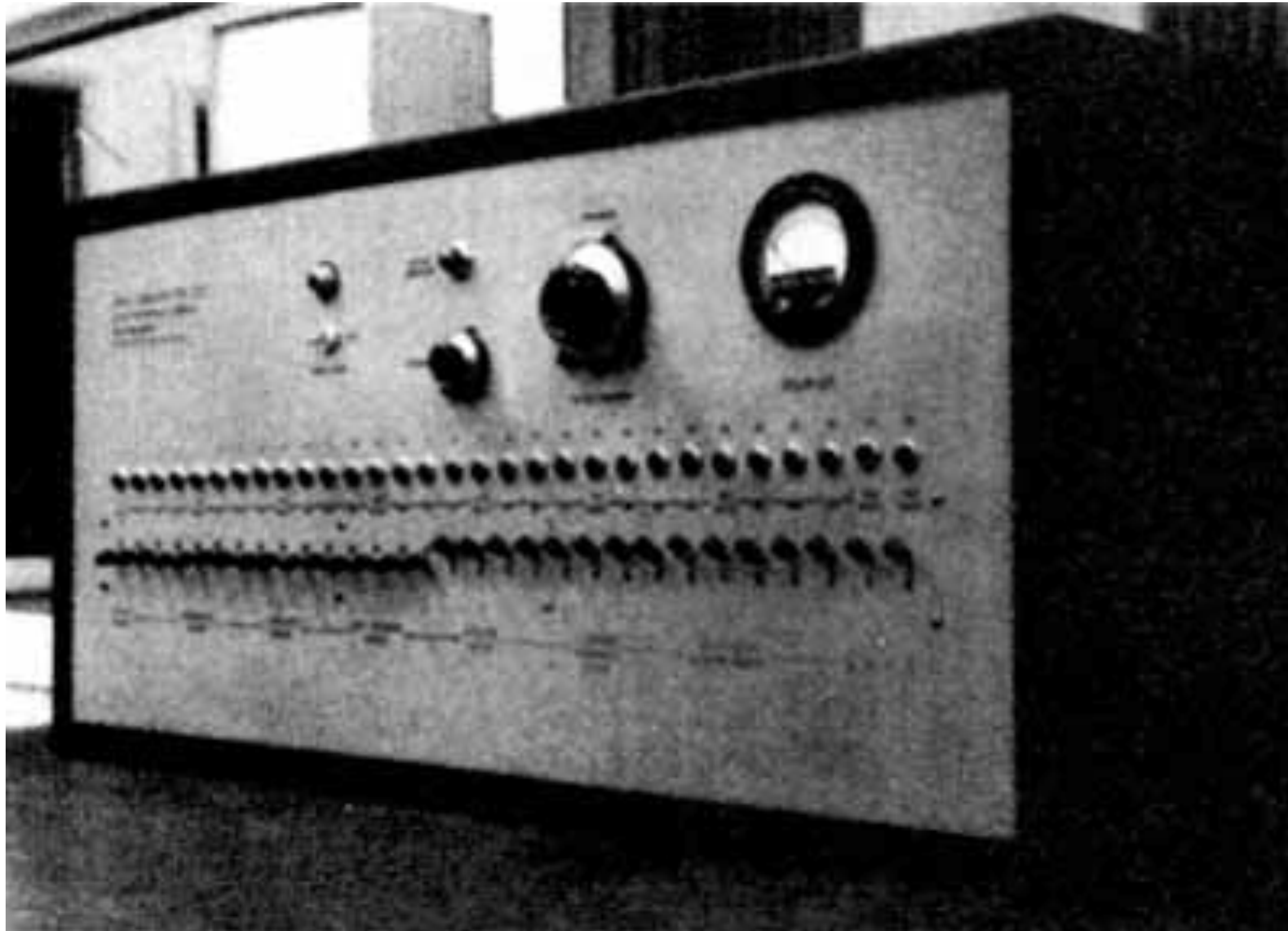
To each person according to merit

## Application

Selection of research participants

# MILGRAM OBEDIENCE TO AUTHORITY

1961 Experiment by Stanley Milgram





# ETHICS: STANFORD PRISON EXPERIMENT

1971 Experiment by Phil Zimbardo at Stanford

24 Participants – half prisoners, half guards (\$15 a day)

Basement of Stanford Psychology building turned into mock prison

Guards given batons, military style uniform, mirror glasses,...

Prisoners wore smocks (no underwear), thong sandals, pantyhose caps







# ETHICS: STANFORD PRISON EXPERIMENT

Experiment quickly got out of hand

Prisoners suffered and accepted sadistic treatment

Prison became unsanitary/inhospitable

Prisoner riot put down with use of fire extinguishers

Guards volunteered to work extra hours

Zimbardo terminated experiment early

Grad student Christina Maslach objected to experiment

Important to check protocol with ethics review boards



[Home](#) » [Christina MASLACH](#)

## Christina MASLACH



Professor

Chair of the Academic Senate

[Contact Information](#)


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Ph.D., Stanford University

**Curriculum Vitae:**  [CV 2012.pdf](#)

**Research Interests:** Social: job burnout and health psychology; individuation and dissent, gender roles

**Research Areas:** [Social-Personality](#)

# ETHICS

Was it useful?

"...that's the most valuable kind of information that you can have and that certainly a society needs it" (Zimbardo)

Was it ethical?

Could we have gathered this knowledge by other means?



# **ETHICS (MORE RECENTLY)**

In 2001, a faculty member from the business school of a major university designed a study to see how restaurants would respond to complaints from putative customers. As part of the project, the researcher sent letters to restaurants falsely claiming that he and/or his wife had suffered food poisoning that ruined their anniversary celebration. The letters disclaimed any intention of contacting regulatory agencies and stated that the only intent was to convey to the owner what had occurred “in anticipation that you will respond accordingly.” Restaurant owners were understandably upset and some employees lost their jobs before it was revealed that the letter was a hoax.

# ETHICS (EVEN MORE RECENTLY)



## The Study

All Facebook users who spoke English qualified

Two groups: positive and negative emotions

Positive/negative posts were then suppressed from the news feed

689,003 participants randomly selected by user id

Saw an impact

When **positive posts withheld** the **participant's posts got more negative**

When **negative posts withheld** the **participants posts got more positive**

Withdrawal effect: people who saw less emotion posts less likely to express themselves for several days

# ETHICS (EVEN MORE RECENTLY)

In June 2014 researchers from Facebook altered the news feed algorithm for 689,003 users to skew the presence of positive or negative posts. They then tracked subsequent posts from those users by using positive or negative keywords.

*“In addition to helping people see and find things that you do and share, we may use the information we receive about you...for internal operations, including troubleshooting, data analysis, testing, research and service improvement.”*

Institutions that receive federal funding are required to abide by a federal policy called the “Common Rule,” which protects human experiment subjects by ensuring that they know about the study and that they understand the risks involved. It also requires institutional review boards at universities and hospitals to approve the way subjects of biomedical or behavioral studies are treated.

# ETHICS (EVEN MORE RECENTLY)

Lead researcher and Facebook data scientist Adam Kramer took to Facebook to defend the study:

“We felt that it was important to investigate the common worry that seeing friends post positive content leads to people feeling negative or left out. At the same time, we were concerned that exposure to friends' negativity might lead people to avoid visiting Facebook,” Kramer wrote.

He went on to explain that the “actual impact on people” was the minimal needed to conclude that Facebook feeds influenced users' emotions. Though they expected happy news would make people feel sad, they found that people with a little more positive news in their feeds included more happy words in their posts.

“Having written and designed this experiment myself, I can tell you that our goal was never to upset anyone,” he wrote in the post. “I can understand why some people have concerns about it, and my coauthors and I are very sorry for the way the paper described the research and any anxiety it caused. In hindsight, the research benefits of the paper may not have justified all of this anxiety.”



# BENEFICENCE: EXAMPLE

## MERL DiamondTouch

User capacitively coupled to table through seating pad

No danger for normal users, **but possibly increased risk for participants with pacemakers**

Inform subjects in consent!



# PRIVACY AND CONFIDENTIALITY

**Privacy** — having control over the extent, timing, and circumstances of sharing oneself with others.

**Confidentiality** — the treatment of information that an individual has disclosed with the expectation that it will not be divulged

Examples where privacy could be violated or confidentiality may be breached in HCI studies?

# TREATING SUBJECTS WITH RESPECT

## Follow human subject protocols

Individual test results will be kept confidential

Users can stop the test at any time

Users are aware (and understand) the monitoring technique(s)

Their performance will not have implications on their life

Records will be made anonymous

## Use standard informed consent form

Especially for quantitative tests

Be aware of legal requirements

# CONDUCTING THE EXPERIMENT

## Before the experiment

Have them read and sign the consent form

Explain the goal of the experiment in a way accessible to users

Be careful about the demand characteristic

(Participants biased towards experimenter's hypothesis)

Answer questions

## During the experiment

Stay neutral

Never indicate displeasure with users performance

## After the experiment

Debrief users (Inform users about the goal of the experiment)

Answer any questions they have

# MANAGING SUBJECTS

## Don't waste users' time

Use pilot tests to debug experiments, questionnaires, etc...

Have everything ready before users show up

## Make users comfortable

Keep a relaxed atmosphere

Allow for breaks

Pace tasks correctly

Stop the test if it becomes too unpleasant

# IF YOU WANT TO LEARN MORE...

Online human subjects certification courses:

E.g., <http://phrp.nihtraining.com/users/login.php>

The Belmont Report: Ethical Principles and Guidelines for the protection of human subjects of research

1979 Government report that describes the basic ethical principles that should underly the conduct of research involving human subjects

<http://www.hhs.gov/ohrp/humansubjects/guidance/belmont.html>



# MULTI-TASKING

# MULTI-TASKING

Social scientists have long assumed that it's impossible to process more than one string of information at a time.

The brain just can't do it.

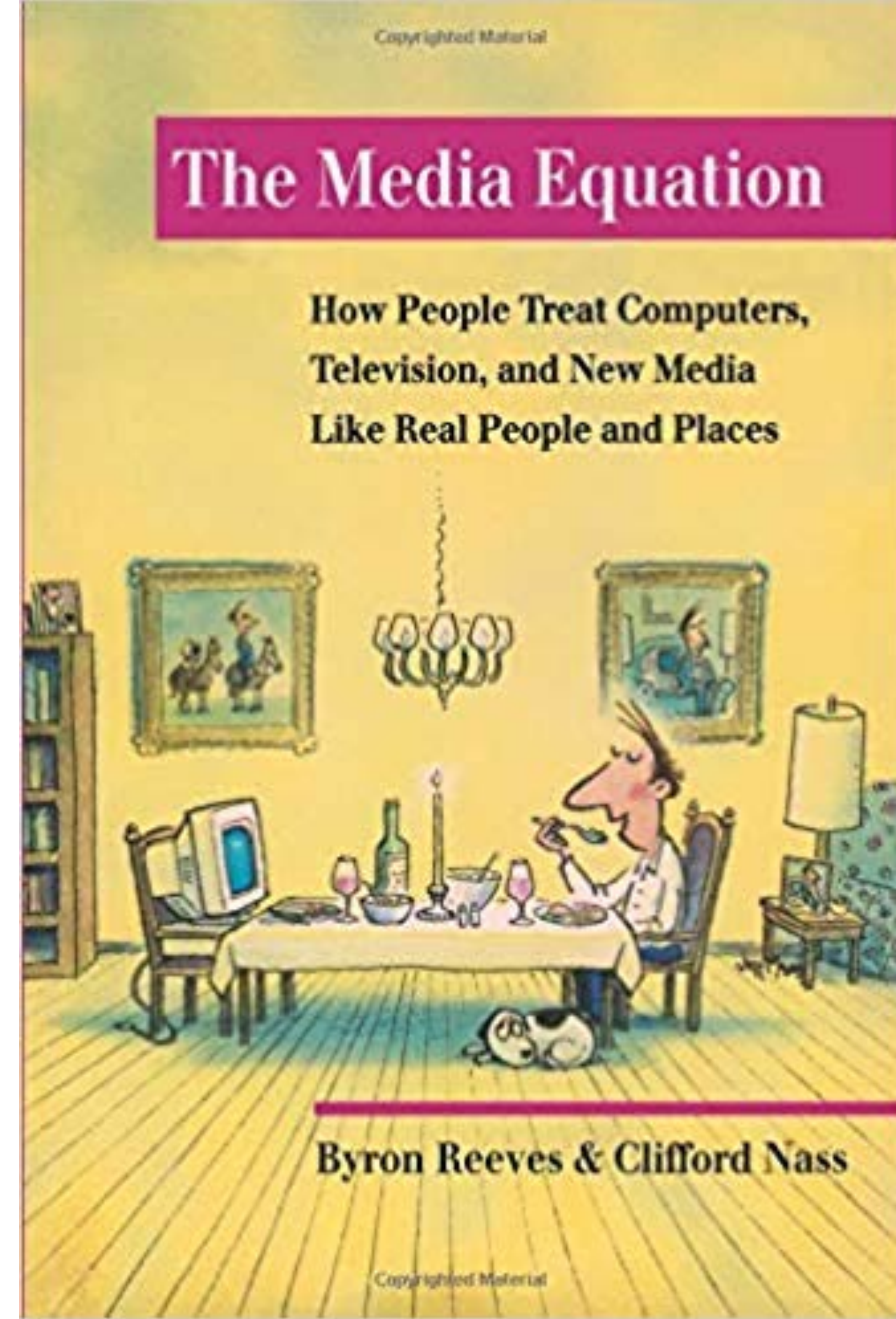
But many researchers have guessed that people who appear to multitask must have superb control over what they think about and what they pay attention to.



**CLIFF NASS**



The Media Equation is a general communication theory that claims that people tend to treat computers and other media as if they were either real people or real places



# ALONE TOGETHER



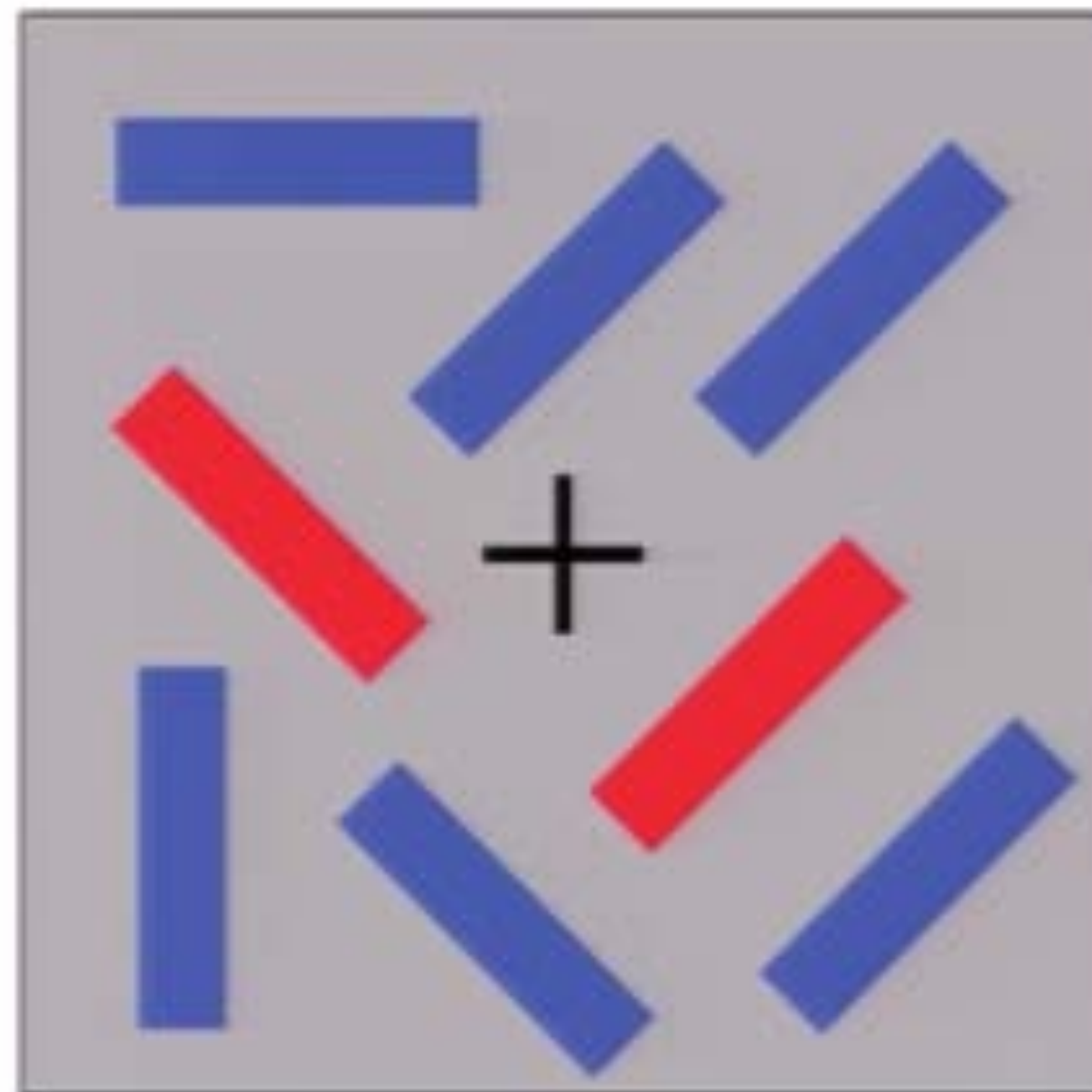
# MULTI-TASKING

HCI Researchers split their subjects into two groups:

- 1) those who regularly do a lot of media multitasking
- 2) those who don't

# MULTI-TASKING

In one experiment, the groups were shown sets of two red rectangles alone or surrounded by two, four or six blue rectangles. Each configuration was flashed twice, and the participants had to determine whether the two red rectangles in the second frame were in a different position than in the first frame.



# MULTI-TASKING

They were told to ignore the blue rectangles, and the **low multitaskers had no problem doing that**. But the **high multitaskers were constantly distracted by the irrelevant blue images**. Their performance was horrible.

# MULTI-TASKING

Because the high multitaskers showed they couldn't ignore things, the researchers figured they were better at storing and organizing information. **Maybe they had better memories.**

# MULTI-TASKING

**The second test proved that theory wrong.**

After being shown sequences of alphabetical letters, the high multitaskers did a lousy job at remembering when a letter was making a repeat appearance.

...The low multitaskers did great! The high multitaskers were doing worse and worse the further they went along because they kept seeing more letters and had difficulty keeping them sorted in their brains.



# MULTI-TASKING

If the heavy multitaskers couldn't filter out irrelevant information or organize their memories, perhaps they excelled at switching from one thing to another faster and better than anyone else.

# MULTI-TASKING

**Wrong again, the study found.**

The test subjects were shown images of letters and numbers at the same time and instructed what to focus on. When they were told to pay attention to numbers, they had to determine if the digits were even or odd. When told to concentrate on letters, they had to say whether they were vowels or consonants.

**Again, the heavy multitaskers underperformed the light multitaskers.**

“They couldn’t help thinking about the task they weren’t doing”

“The high multitaskers are always drawing from all the information in front of them. They can’t keep things separate in their minds.”

# **MULTI-TASKING**

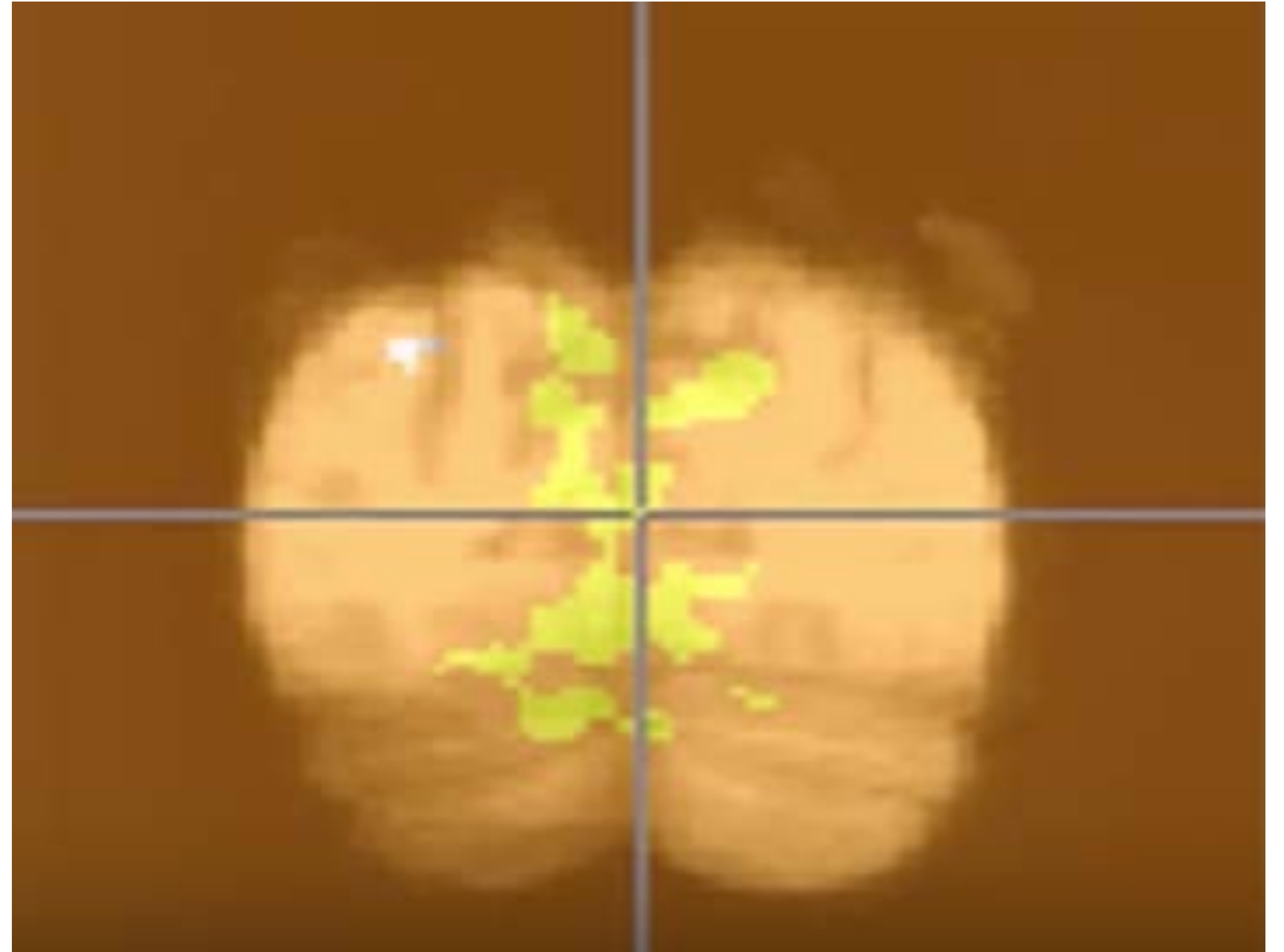
When multitaskers are in situations where there are multiple sources of information coming from the external world or emerging out of memory, they're not able to filter out what's not relevant to their current goal. That failure to filter means they're slowed down by that irrelevant information.

# MULTI-TASKING

Poor filtering

Ineffective memory management

Suckers for irrelevancy



# MULTI-TASKING

## **Frequent multitaskers**

- Used media when face-to-face
- Feel less normal
- More bad influences (friends)
- Less Sleep

## **Face-to-Face Interaction**

- Focused on other person
- Greater social success
- Felt more normal
- Had better friendships
- Got more sleep

