

January 24, 2019
Issues of Human Interface Design



ENGR110/210

Perspectives in Assistive Technology



David L. Jaffe, MS
Instructor

13
Years

Questions?



Stenography Machine



T P H O U
T H A
K W R A O U F
R E D
T H U R B G S
T P H O E U F P
P H O E R
P W H O O U
T O



Team Projects

Activities you should be pursuing:

- ❑ Meet with Dave
- ❑ Purchase PRL Shop Pass
- ❑ Connect with project suggestor
- ❑ “Understand the Problem”
 - ❑ Internet search
 - ❑ Existing products / devices
 - ❑ Survey technology
- ❑ Brainstorm
- ❑ Select Design Concept
- ❑ Prototype



Work with Diligence

- ▶ Time is your team's most precious resource
- ▶ 6 weeks of class left to work on your projects
- ▶ Mid-term team presentations in 3 weeks



Rules of Brainstorming

- ▶ Rules: “You can’t brainstorm alone”
 - ▶ Start with a full understanding of the problem
 - ▶ Defer judgment - do not critique
 - ▶ Produce lots of ideas
 - ▶ One person talking at a time
 - ▶ Be visual - draw something quickly
 - ▶ Build upon the ideas of others
 - ▶ Stay on topic
 - ▶ Explore wild ideas, including suspending reality
 - ▶ What would they do on Star Trek?
 - ▶ Violate the Laws of Physics
 - ▶ Use Harry Potter’s magic wand
 - ▶ Use “The Force”



The seven rules of brainstorming - Ideo



Selecting Design Concepts



- ▶ Select best design concepts using a Pugh Chart
 - ▶ Plot best design concepts vs design criteria
 - ▶ Ability to meet requirements & criteria
 - ▶ Prototype fabrication cost
 - ▶ Complexity (consider skill level of fabricators)
 - ▶ Ability to complete within allotted time and budget
 - ▶ Caregiver issues



Criteria for Success		Option 1		Option 2		Option 3	
Common Theme	7	7	49	6	42	10	70
Expands Knowledge	5	5	25	3	15	7	35
Accurate Info	9	8	72	8	72	7	63
Appealing	8	6	48	9	72	7	56
Unique	10	9	90	6	60	6	60
3 different forms of media	10	9	90	7	70	8	80
Reflects Rauschenberg	4	7	28	10	40	6	24
	TOTAL		402		371		388

- ▶ Weights - which features are most important?


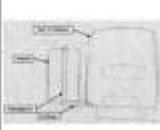




Selecting Design Concepts

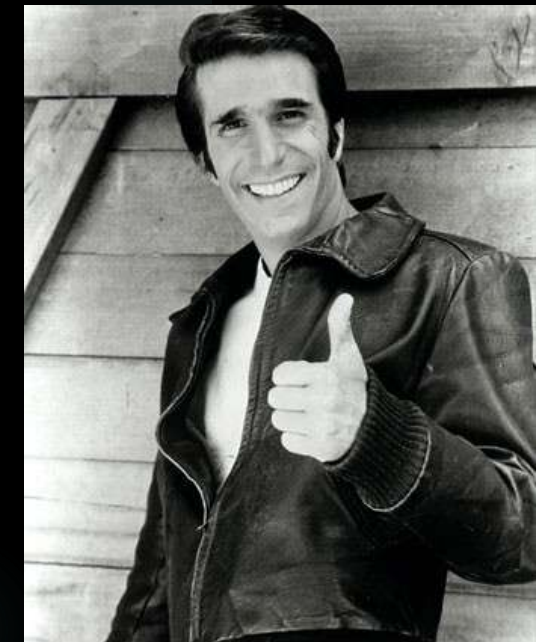


Don't forget **aesthetics** and **coolness factor**

- ▶ Users won't buy or use a product that identifies them as disabled
- ▶ Users want to look cool
- ▶ You want to work on something cool



Description		Kimberly Clark Paper Towel Dispenser	Side Roll	Paper Quantity Sensor	Clear Windows	Free-Standing w/ Recycling	Foot Pedal
Sketch							
Criteria	Weight	Datum	Design 1	Design 2	Design 3	Design 4	Design 5
Reliability	2	0	+	0	0	0	-
Hygiene	3	0	-	0	0	0	+
Ease of Use	3	0	+	0	0	+	+
Safety	2	0	0	0	0	0	0
Durability	1	0	0	0	0	0	0
Aesthetics	1	0	-	0	-	--	-
Ease of Replacement	1	0	0	+	+	0	0
Environment	2	0	0	0	0	+	--
+		0	5	1	1	2	6
0		15	6	15	13	9	4
-		0	4	0	1	2	7
Net Score		0	1	1	0	0	-1



Pre-Lecture Discussion Topics



- 22 - Ethical / Moral Dilemmas Related to Disability
- 22 - In the News - New Assistive Technology products and research
- 20 - Assistive Robotics - Robotic technology benefitting people with disabilities and older adults
- 15 - Overview of Accessibility - How this design feature relates to products, with many examples
- 15 - Ten Commandments of Making - Adam Savage's Maker Faire video
- 15 - Video Theatre - Watch and discuss videos of new products and prototypes
- 12 - **Vintage Assistive Technology - Products and devices from the past**
- 12 - The Upside of Failure - Learning from prototypes that didn't work
- 12 - Who is Disabled? - Making a determination with limited information
- 12 - Innovative Marketing Metrics - How we use words to measure and advertise
- 9 - Famous people with disabilities - Focus on TV characters

Vintage Computer Technology



HOW TO "READ" FM TUNER SPECIFICATIONS


Popular Electronics

WORLD'S LARGEST-SELLING ELECTRONICS MAGAZINE • JANUARY 1975 • 75¢

PROJECT BREAKTHROUGH!

World's First Minicomputer Kit to Rival Commercial Models...

"ALTAIR 8800" SAVE OVER \$1000



ALSO IN THIS ISSUE:

- An Under-\$90 Scientific Calculator Project
- CCD's—TV Camera Tube Successor?
- Thyristor-Controlled Photoflashers

TEST REPORTS:

- Technics 200 Speaker System
- Pioneer RT-1011 Open-Reel Recorder
- Tram Diamond-40 CB AM Transceiver
- Edmund Scientific "Kirlian" Photo Kit
- Hewlett-Packard 5381 Frequency Counter



44 years ago!

Vintage Computer Technology



What kind of man owns his own computer?

Rather revolutionary, the whole idea of owning your own computer? Not if you're a diplomat, printer, scientist, inventor... or a kite designer, too. Today there's Apple Computer. It's designed to be a *personal* computer. To un-complicate your life. And make you more effective.

It's a wise man who owns an Apple.

If your time means money, Apple can help you make more of it. In an age of specialists, the most successful specialists stay away from uncreative drudgery. That's where Apple comes in.

Apple is a real computer, right to the core. So just like big computers, it manages data, crunches numbers, keeps records, processes your information and prints reports. You concentrate on what you do best. And let Apple do the rest. Apple makes that easy with three programming languages—including Pascal—that let you be your own software expert.

Apple, the computer worth not waiting for.

Time waiting for access to your company's big mainframe is time wasted. What you need in your department—

on *your* desk—is a computer that answers only to you... Apple Computer. It's less expensive than timesharing. More dependable than distributed processing. Far more flexible than centralized EDP. And, at less than \$2500 (as shown), downright affordable.



Visit your local computer store.

You can join the personal computer revolution by visiting the Apple dealer in your neighborhood. We'll give you his name when you call our toll free number (800) 538-9696. In California, (800) 662-9238.

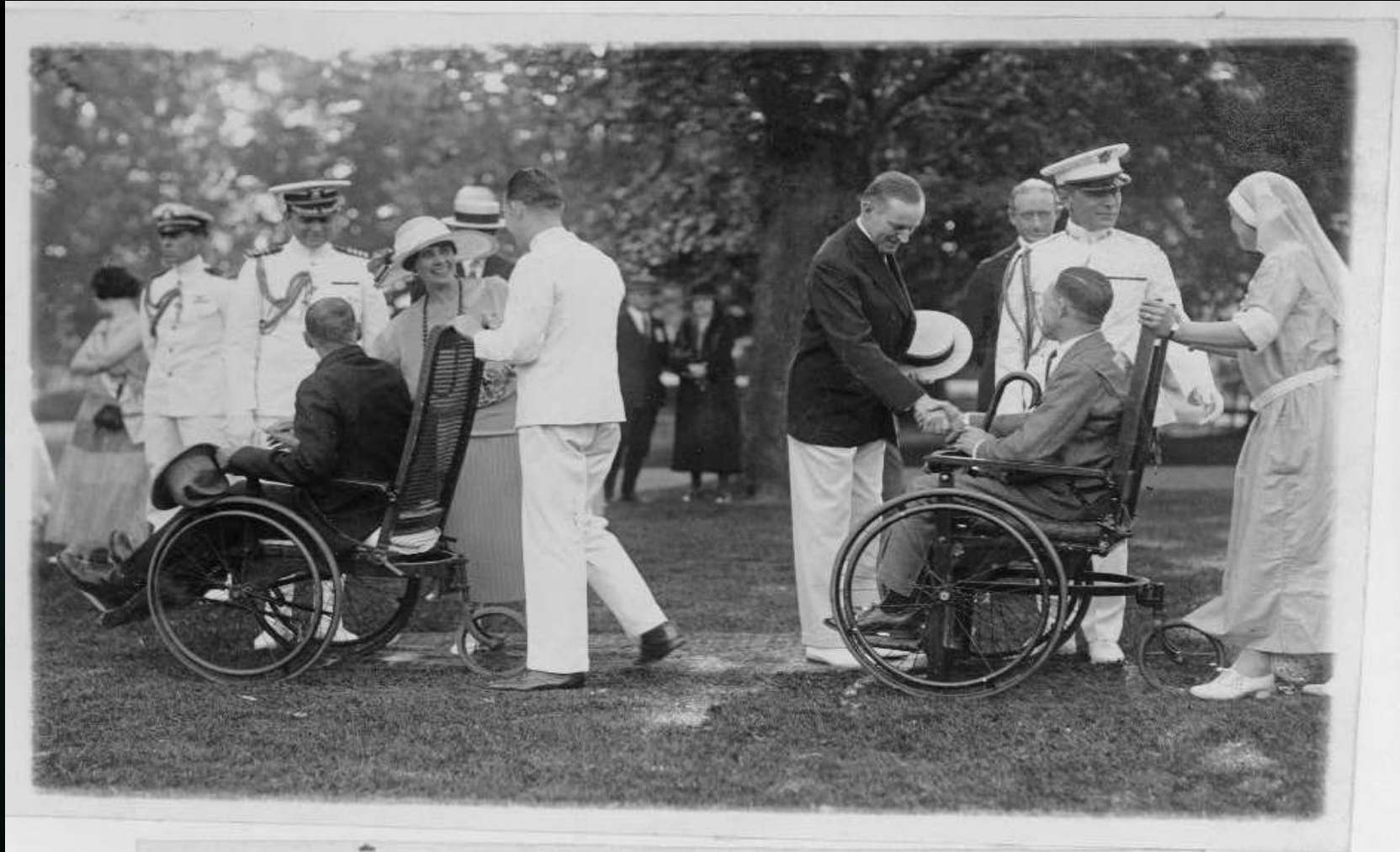
Apple Computer, 10260 Bandley Drive, Cupertino, CA 95014.



Old Wheelchair Designs



Old Wheelchair Designs

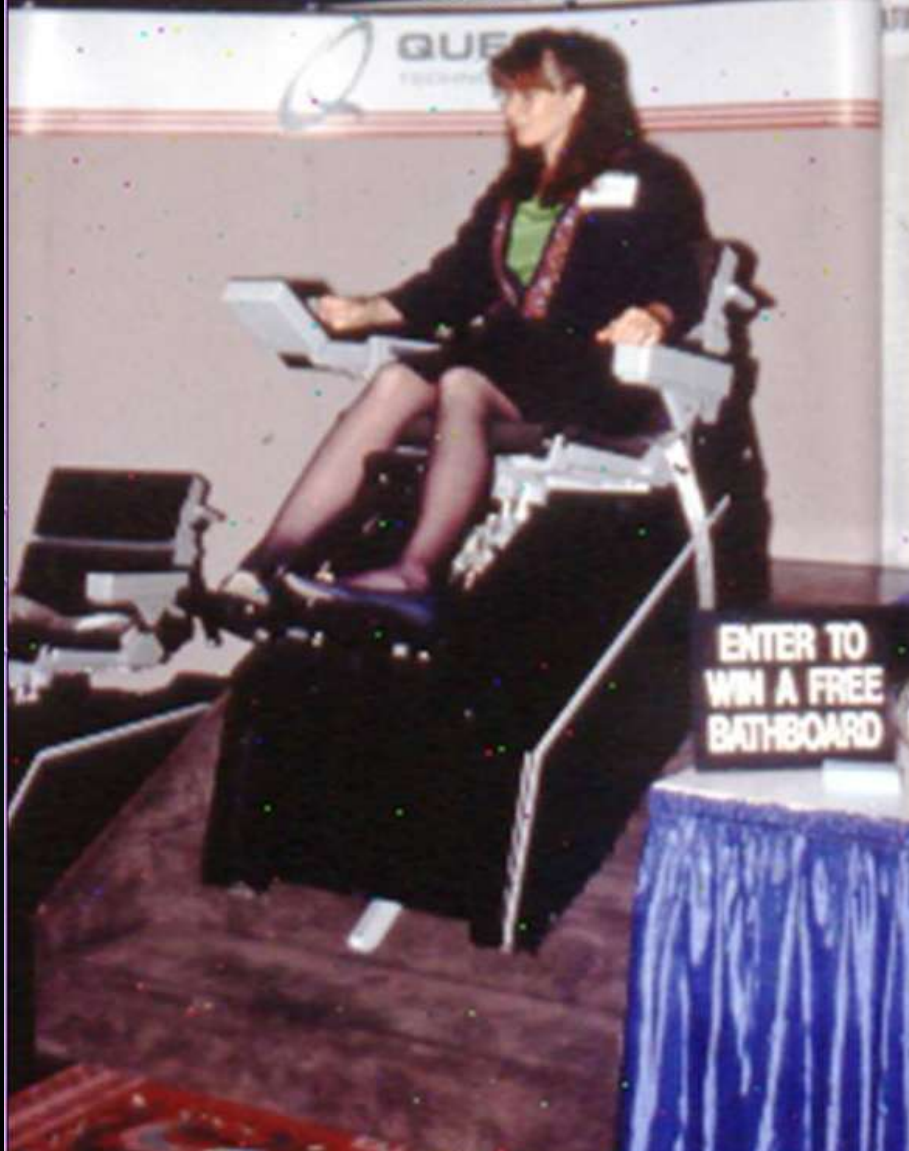


Garden party for Wounded men at the
White House 6/5/24 30963

Old Wheelchair Designs



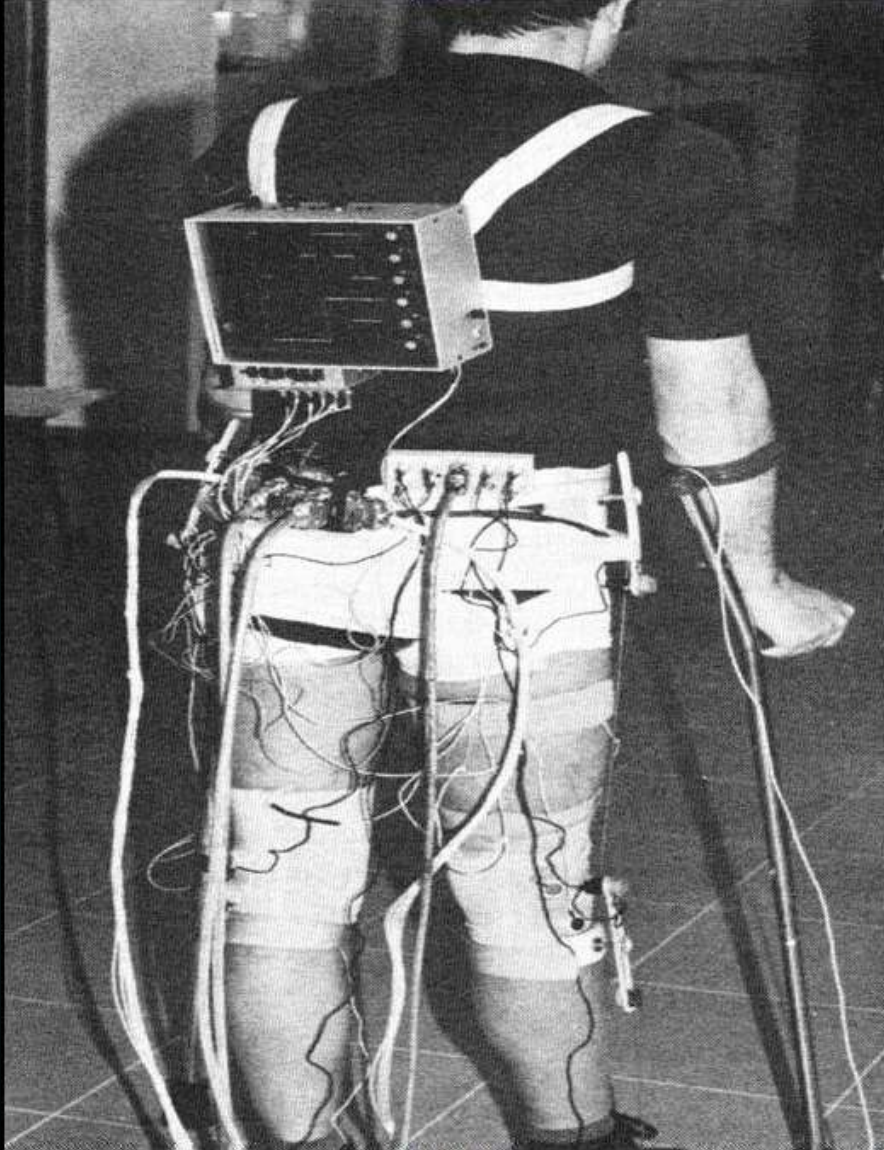
Old Wheelchair Designs



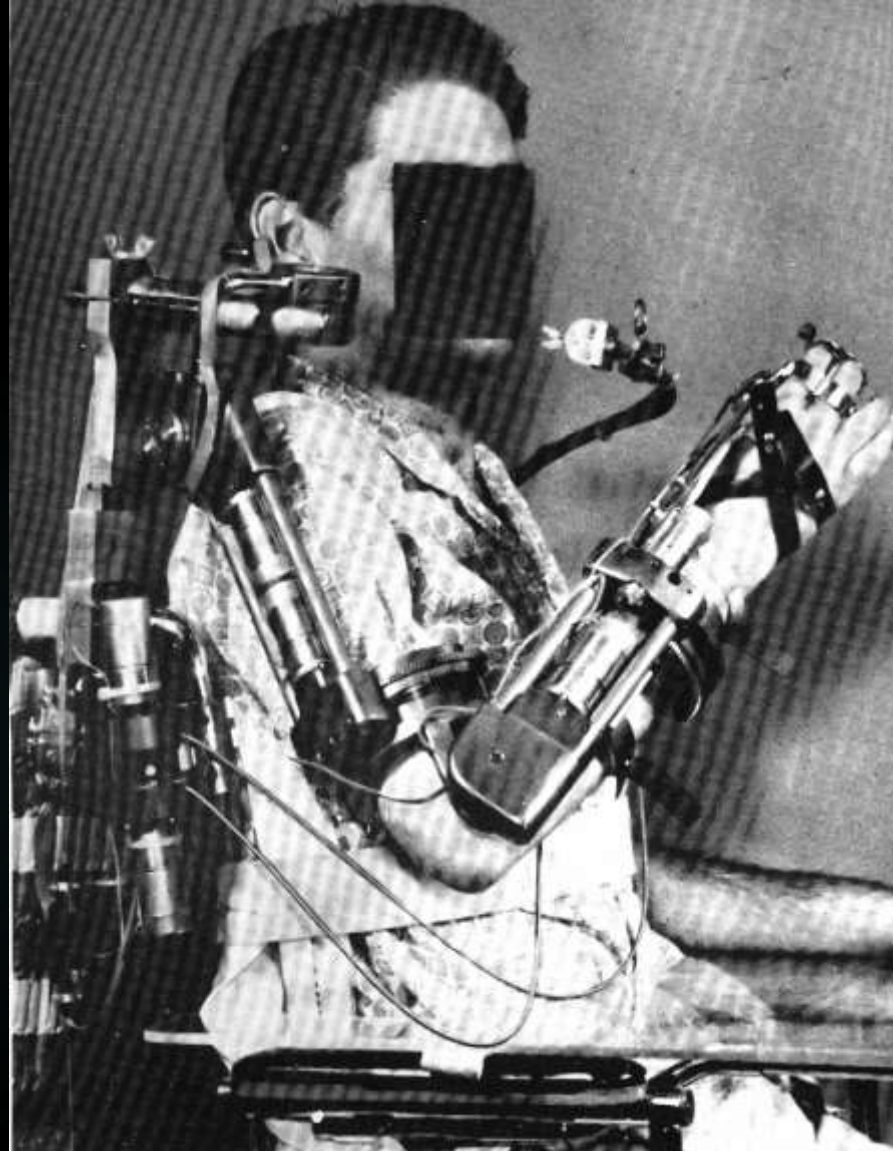
Omni-directional Wheelchairs



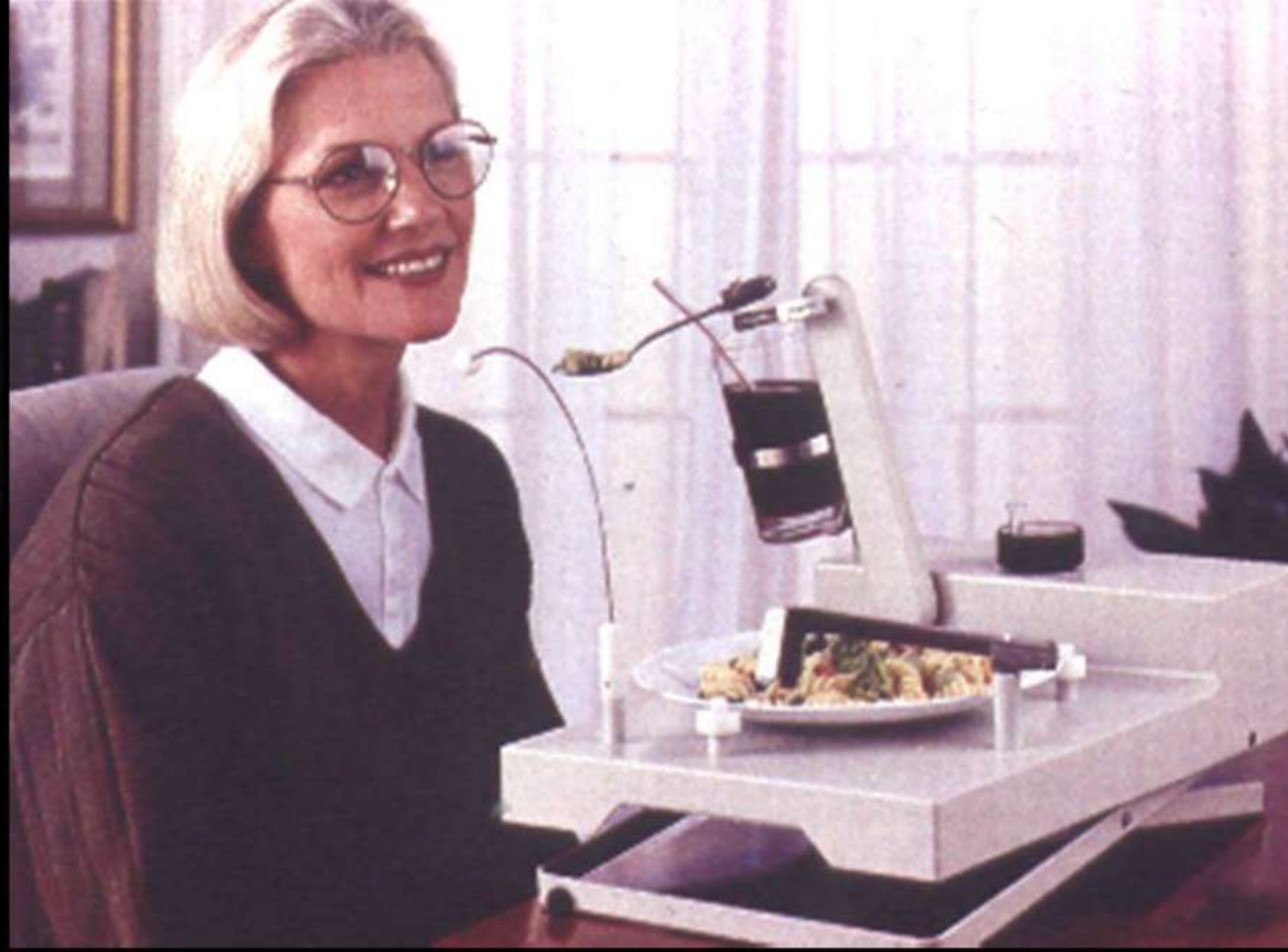
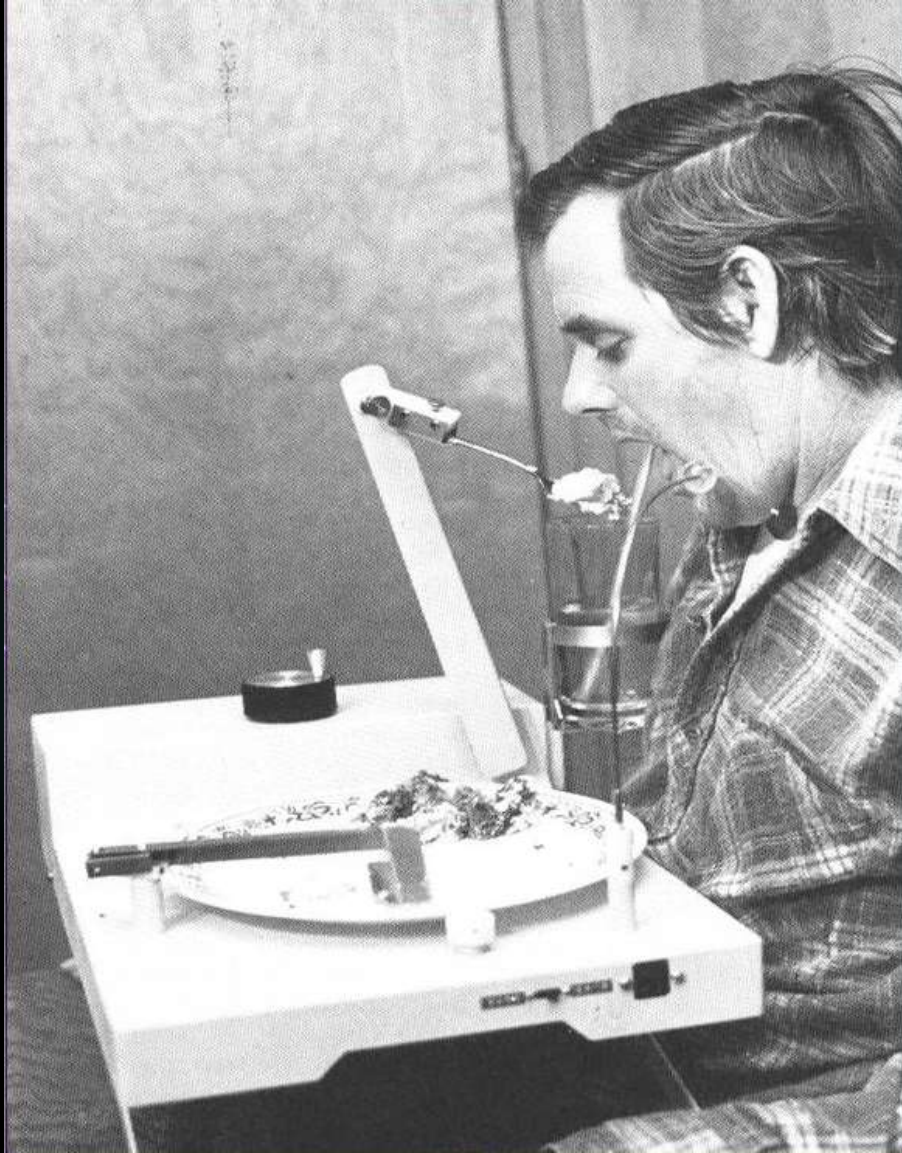
FES Walking



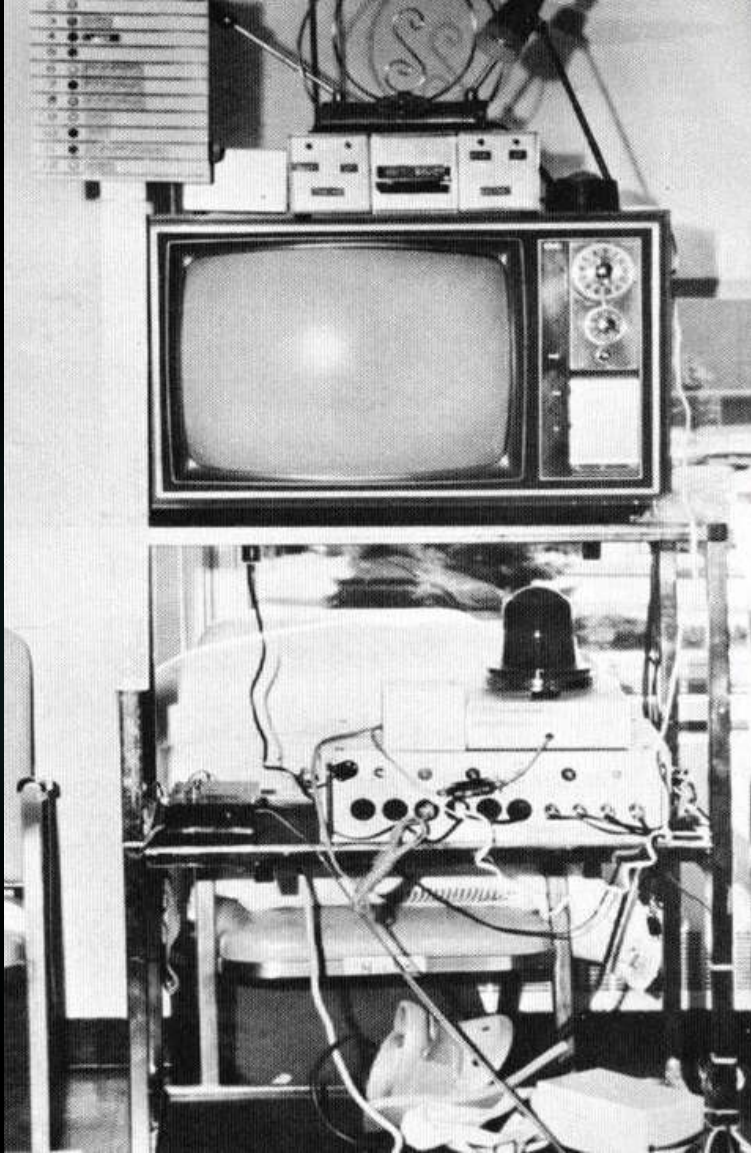
Chin Controlled Arm Exoskeleton



Robotic Feeding Aids



Early Environmental Control Systems



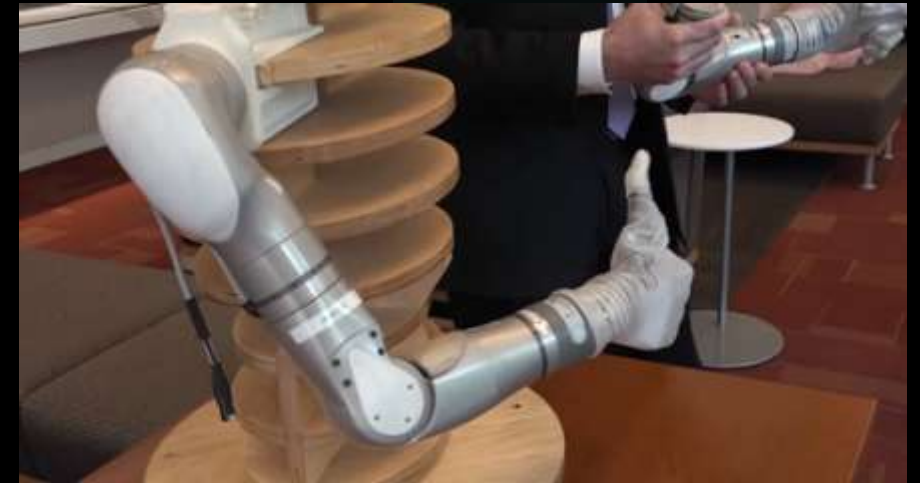
Eye Gaze Control



Augmented Communication System



Artificial Arm from 1560 - 1600



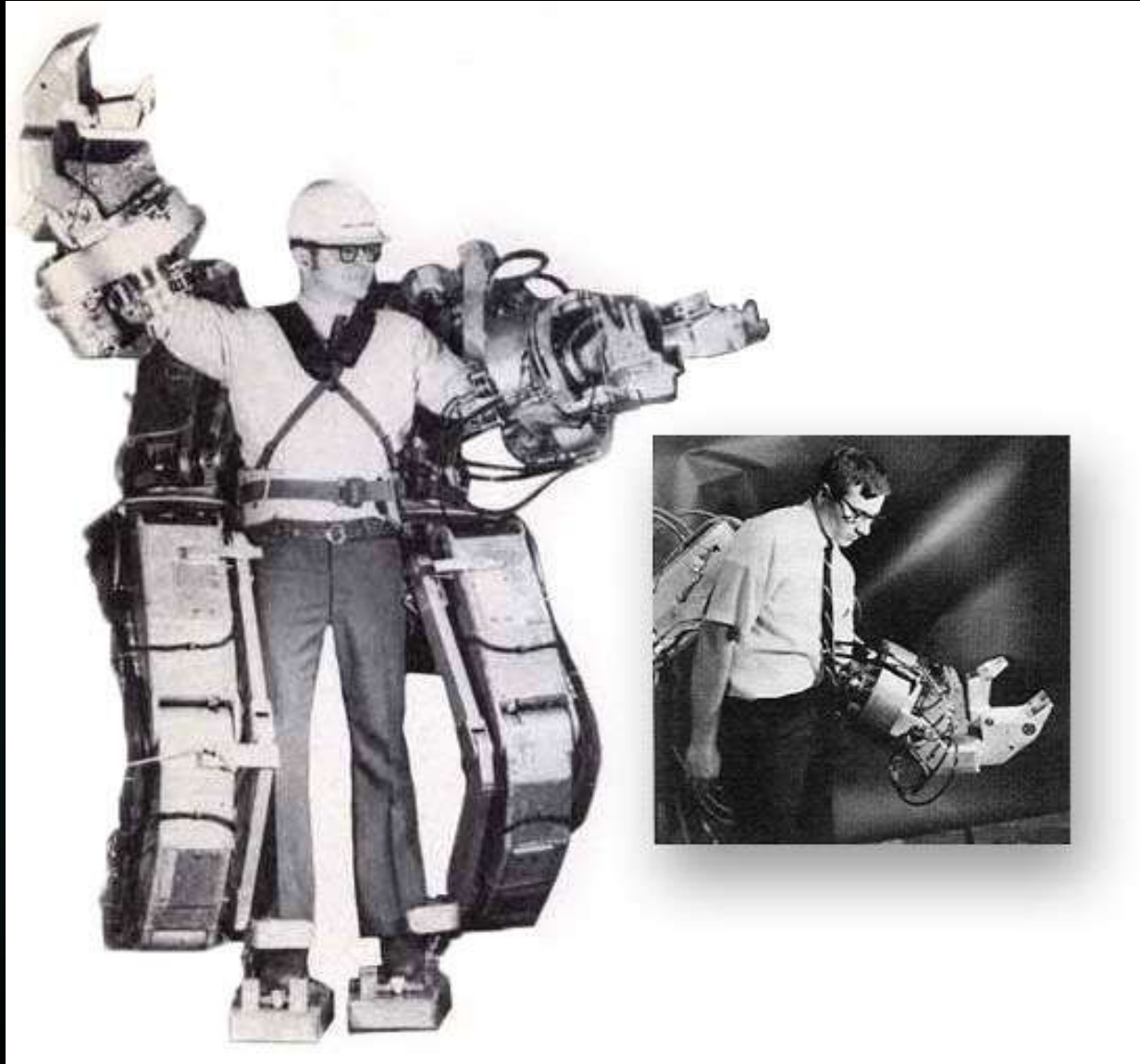
Peg Leg Bates



Wooden Prosthetic Legs



Hardiman Prototype - 1950s



Student Exoskeleton Arms



Ultimate Exoskeleton



Ultimate Hand Orthotic

Space,
Time,
Reality,
Mind,
Soul,
and
Power.



Thanos' Infinity Gauntlet



Steampunk Professor Xavier Wheelchair Project



Steam Punk Professor Xavier's Wheelchair
By: Daniel Valdez
<http://www.meeon.com/>

[Video](#)

Orange County Chopper



▶ Christopher & Dana Reeve Foundation

▶ [Video](#)



Tuesday, January 29th



From Idea to Market: Eatwell, Assistive Tableware for Persons with Cognitive Impairments (by video)

Sha Yao
Sha Design



Today



Issues of Human Interface Design

Gary M. Berke, MS, CP, FAAOP
Stanford Medical Center



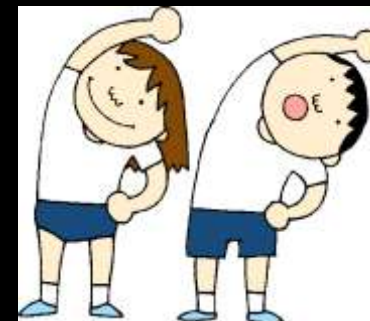
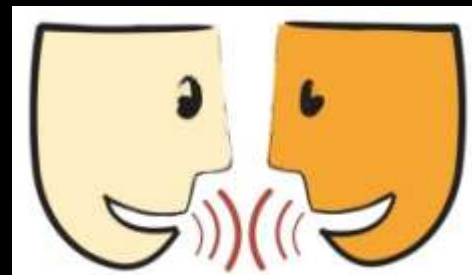
Short Break



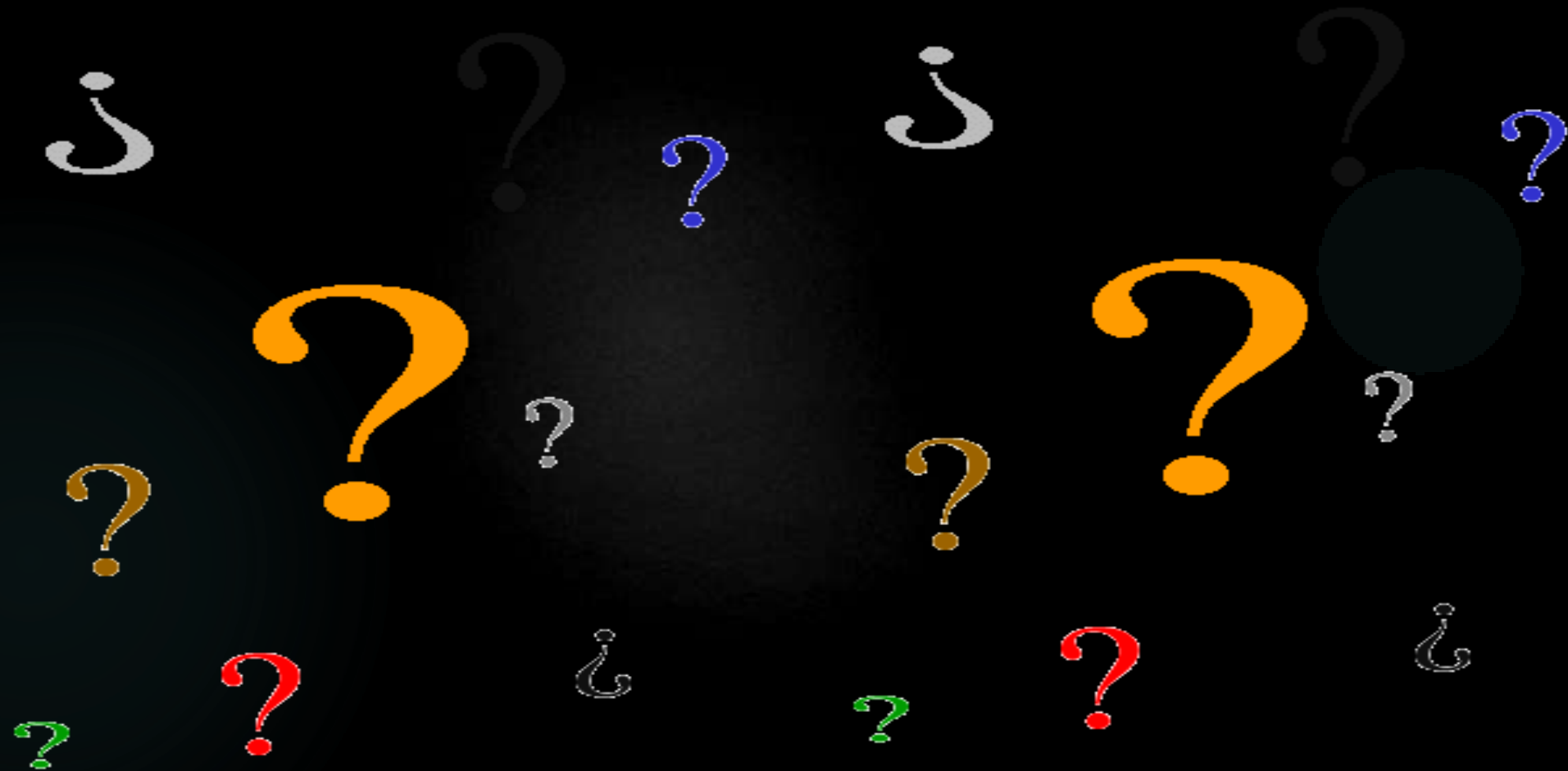
Break Activities



- ▶ Sign attendance sheet
- ▶ Grab a cookie
- ▶ Stand up and stretch
- ▶ Take a bio-break
- ▶ Text message, web-surf, email
- ▶ Talk with classmates
- ▶ Reflect on what was presented in class



Questions?



Adjourn



class dismissed



Laptops Galore



Time for Questions?



End the class

