

Incorporating artificial intelligence into aphasia services

Brent Archer, PhD, CCC-SLP

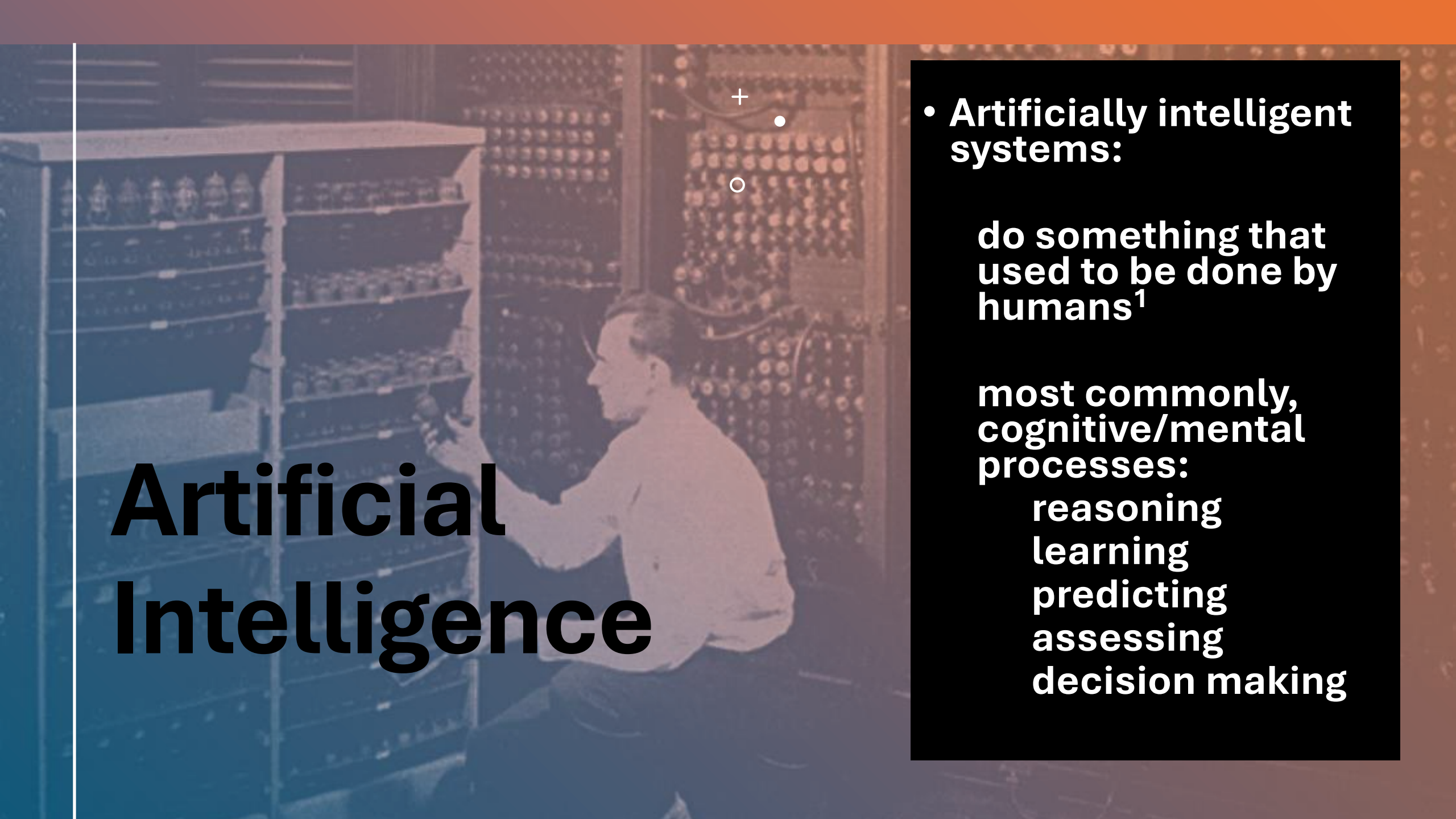
Aphasia CHAT Lab

Outline

- What are AI systems and how are they built?
- Three use cases in aphasia practice:
  - Making info accessible to people and families living with aphasia (environment)
  - AI-based conversation practice platforms (impairment; participation)
  - Recovery prediction (all four domains)
- Focus on how these tools have implications for the AFROM Domains (environment, participation, lg impairment, personal factors)

Caveat

- Drinking from a thousand fire hoses
  - Useful devices
  - Examples of other systems
  - Free and accessible
  - Aphasia focused
- Ideas
  - Concepts
  - Inform decisions about how to integrate AI into practise



Artificial Intelligence

- **Artificially intelligent systems:**

  do something that used to be done by humans[1]

  most commonly, cognitive/mental processes:
  - **reasoning**
  - **learning**
  - **predicting**
  - **assessing**
  - **decision making**

ChatGPT

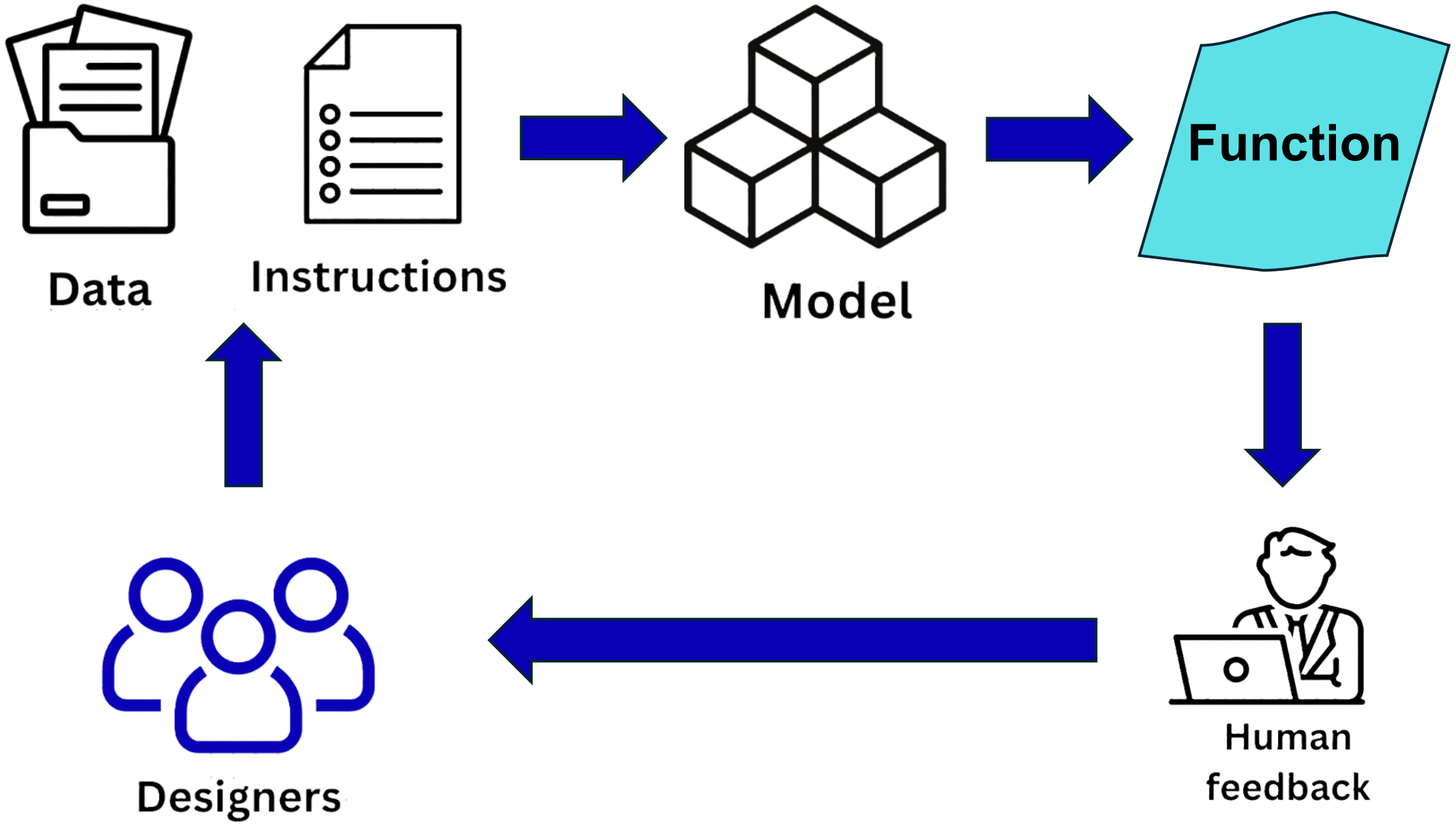
Respond to text input



Navigate

How are AI systems built?




Data
Instructions
Model
Function
Human
feedback
Designers

Some ideas to consider when thinking about adopting AI

The machine will serve its makers

- Built to serve a need
- Reflects the values and interests of its builders
- May not reflect the values of users/ppl impacted by decisions
- e.g. Algorithm for sentencing guidelines (COMPAS)[48-49]
- Ask questions about who participated in design
- Use frameworks like the AFROM to suggest questions about how this system impacts functioning across aspects of aphasia

Use case 1: Creating more aphasia friendly environments

- Ppl/families living with aphasia: difficulty accessing (written) info[7]
- Medical care, voting, legal documents, research, consumer info[9-15]
- Challenge: Lack of time
- Could AI be useful time saving device?

Standards for promoting accessibility

- No consensus in aphasia lit; wide variety of practices
- Standard from field of communication:

BASIC English (British American Scientific Industrial Commercial)[16]
Designed to foster communication
Small vocab set: 850 core words
No figurative language
Short phrases and sentence

Aftercare instructions for dental implants (killeendentalgroup.com)

- **Immediate post-operative care (first 24-48 hours)**
- **Control bleeding:**
- Gently bite down on the gauze provided for 30-60 minutes. If bleeding continues, replace the gauze and repeat the process.
- **Manage swelling:**
- Apply an ice pack to the outside of your face, on and off for 20 minutes at a time, for the first 48 hours to help reduce swelling. Keep your head elevated when lying down.
- **Rest:**
- Avoid strenuous activities for the first 48-72 hours. Rest helps your body focus on healing.
- **Diet:**
- Eat only soft foods that require minimal chewing, like yogurt, mashed potatoes, or soup.
- **Avoid:**
- Do not rinse, spit, smoke, drink alcohol, or use straws. Also, avoid hot foods and drinks, and don't touch the implant site with your tongue or fingers.
- **Medication:**
- Take any prescribed antibiotics and pain relievers as directed.

Prompt:

- Write in BASIC English
- Keep sentences short
- Format into a Word doc
- Size 14 font
- Lots of white space

Immediate Care (First 24–48 Hours)

Rest: Stay quiet. Do not do hard work. This helps stop pain or bleeding.

Ice: Put a cold pack on the area for 15–20 minutes at a time. This helps lower swelling.

Medicine: Take the pain pills and antibiotics your doctor gave you. They help with pain and stop infection.

No smoking or straws: Do not smoke or use a straw for 24–48 hours.

Do not touch: Do not touch or move the place where you had the surgery.

Food: Eat only liquids or soft foods like yogurt or soft eggs. Do not

Other resources



Aphasia Research Library

https://www.aphasialibrary.org/en/

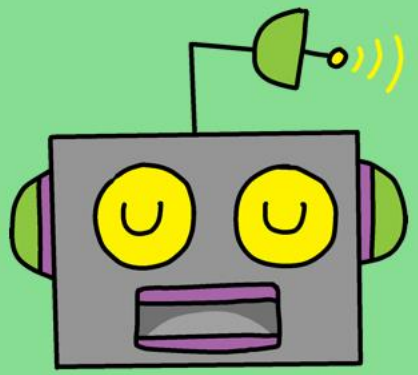
Use case 2: Addressing impairment, increasing particioation

Aphasia GPT

Free

Built by a person with aphasia, Stephen Albright

Role of AI chatbots?



Pro:

- Practice some elements of conv
- Very low cost, convenient
- Improvement w time

Con:

- No multimodality
- Decreased usability with severe disability

A lane for chat bots?

Not a replacement: lack of effective practice, relationship building

Adjunct to tx; add-on to maximize gains

More resources; adaptive AI powered speech generating devices

vocable

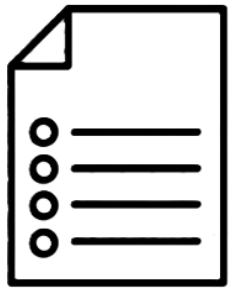
- Free
- Smartphone app
- Can be controlled with eye gaze
- ‘Listening’ mode
- Based on Chat GPT (privacy)

- Conversations app
- Runs on Lingraphica devices
- Emphasis on speed
- Transcription
- Private data centers, deletes conversations

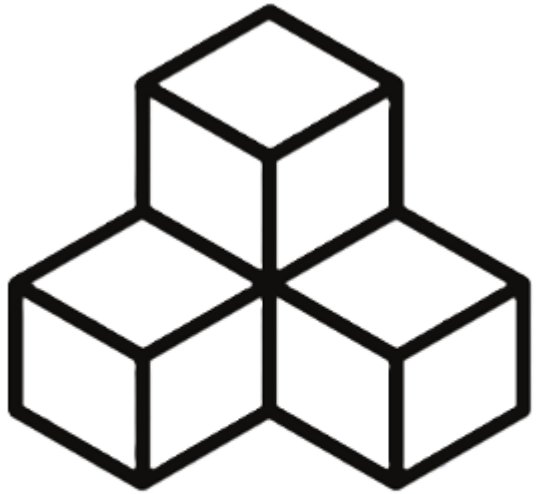
Use case 3: Predicting recovery

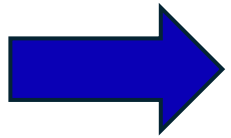
(implications for all AFROM domains)











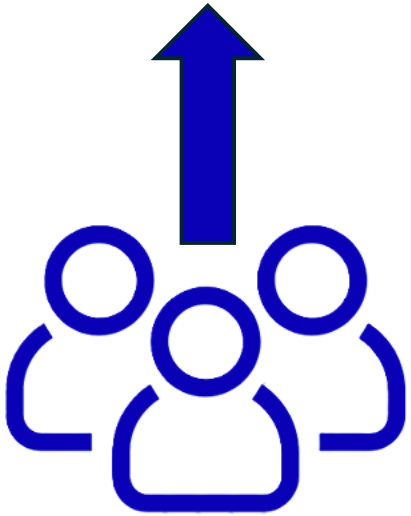
Predict aphasia recovery

Standardized tests
Brain damage
Demographics

Correlation between measures and recovery

Model

Therapy outcomes



Designers

How do the model developers define recovery?

- Confrontation naming: correctly producing names
- Building simple sentences and phrases
- Narrow definition of recovery

How do people and families living with aphasia define recovery?

- Participation, meaningful relationships, communication in daily life[17]
- Flexible, life-relevant range of services, participate in and contribute to community[18]
- Living successfully: sharing life with others; relationships spouse, ,immediate family, grandchildren, friendships.[19]
- Priorities of people/families living with aphasia: improve communication, improved participation[20]

Possible implications of narrow definition of recovery: who and what are missing?

- People who had strokes years ago [21]
- People who would benefit from AAC
- People who might benefit from conversation-focused therapies: Facilitating Authentic Communication (FAC)[22], Expanding Communication and Language Opportunities Generated in Conversation (ECoLoGiC)[23], Aphasia Couples Therapy[24]
- People, families and friends would benefit from communication partner training: Supported Conversation in Aphasia[25,26]

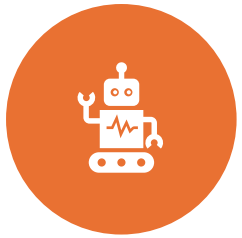


Re-enforcing able-ism?

- People with severe aphasia:
  - Greater communication disability[27]
  - Decreased quality of life[28]
  - More social isolation[29,30]
  - More mental health difficulties[31,32]
  - Less likely to return to work[34]
- Rationing care?
- Will AI predictive models exacerbate discrimination against people with severe aphasia?



Closing thoughts



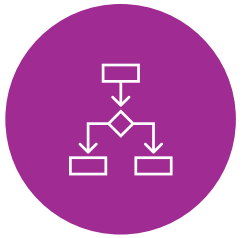
AI: PERVASIVE, APPLICATIONS WILL INCREASE



INTENTIONAL APPROACH



DO THE BENEFITS OUTWEIGH THE DRAWBACKS?



WHAT ARE THE CONSEQUENCES OF USING THIS SYSTEM?



HOW WILL IT IMPACT OUR CLIENTS?

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Rationing care?

- Health care: profit industry
- Providers have an incentive to deny as much care as possible
- AI-systems have been used to ration care:
  - Ongoing law suit
  - Cigna: 300k claims in 60 days; 1.2 seconds/claim
  - United HealthCare: naviHealth, 90% error rate, especially for prior approval for Medicare Advantage
- Are aphasia services next?



If you find this concerning, what can you do?

- Ask questions: how was the AI system designed, who's values does it reflect, who had a seat at the table?
- Follow ethical and professional standards; resist questionable practices
- Support legislation:
  - AI Health Policy Tracker: https://www.manatt.com/insights/newsletters/health-highlights/manatt-health-health-ai-policy-tracker
  - California, Nebraska, Texas, Arizona
  - Mandatory human review
  - Transparency
  - Prevent discrimination
- Connect clients to anti-denial AI resources: https://fighthealthinsurance.com/
- Fight back when your own healthcare claims are denied
- Organize! barcher@bgsu.edu

Myth: AI is inevitable

