Lecture 5: Sociological foundations of HAI: A primer

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So far…

- HAX guidelines & their underlying principles
- Cognitive psychology
  - Also common to classical HCI
  - Mental models, memory, perception, problem solving (gulf of execution/evaluation)
- HAI is different → a lot is also sociological!
  - Today!

What is sociology?

- Study of people's social life
- Studies of groups and the interactions between
- From pairs to small groups to large crowds to societies
- Culture → shared values, practices, beliefs of a group / society
- Sociologists study groups, societies, cultures.

Why sociology in HCI / HAI?

- Computers are social actors (CASA)
- Experiments that showed:
  - People know computers are machines, do not possess feelings, genders, motivations, agency, etc.
  - Yet, people apply social rules when interacting with computers (both to their own actions & computers').
  - What they said they believed/preferred ≠ what they actually did / preferred

Nass' CASA experiments

- When computers asked people to evaluate it, people were more polite when answering on computers than paper & pencil
  - Saying it on your face vs. in a survey
- Praising oneself / other vs. criticizing oneself / other
- Different voices => different actors (even on same device)
- Gender stereotypes (expertise of a gendered computer-tutor)
- Even without referring themselves to "I"!
- Guess: when was this done?
- 1994!

So what?

- Interactions with computers not just cognitive, but also social
- Sociology is important as is cognitive sciences
- Impact on actual systems in classical HCI existed, but not major.
- Still individuals with just computers → so mostly cognitive
  - Less sociology, but existed
  - e.g., Symbolic Interactionism → icons, dialog boxes, etc.
  - Also dominant in computer-supported collaboration work (CSCW)

Welcome to the world of AI

- As we prepare, attendance time!
- https://youtu.be/WF1289XLjEY?si=75RL8Ej3ZKbYTeVf

Welcome to the world of AI…

- Lots of AI systems
- Closer to human “intelligence” in their abilities than simply machines that “compute”
- Control, autonomy, trust, incorrectness, personal data, …
- Closer to social interactions than a person engaging in a cognitive activity
- Makes sociology a key foundational anchor for HAI
- All sociological notions/concepts need to be revisited with AI in the mix (replacing / augmenting a human)

Symbolic interactionism

- People construct meaning about “anything” (here, agent) through symbols, roles, and interactions, based on how they interpret/negotiate those meanings
- Example:
  - Overconfident AI → overreliance, authority, people second guess themselves.
- HAX guideline:
  - Make clear what the AI does & how well
  - Leaves little room for interpretation / guessing / making mistakes
- Do so by language, cues, persona, appearances/embodiment

Examples

- “Ask me anything, and I’ll try my best to synthesize an answer from all the 100 million books and articles I have ingested!”
- https://youtu.be/L6Skgzf_ruY?si=Wl3Bhr2U7TCFmxZo&t=3

Roles

- Role = set of expected behaviors, rights, and obligations attached to a social position
- People internalize their roles (accepted behaviors, rights, obligations) and act accordingly
- A person can have multiple roles, sometimes conflicting
- Roles evolve over time / change with context

Role of AI

- In classical HCI → computers are tools; users use them to accomplish something.
- In AI systems → assistant, tutor, recommender, gatekeeper, co-worker, judge, data junkie(?)
- What role we use to describe a system matters for expectations
  - Programming AI tutors vs. Programming Assistant vs. Copilot vs. Pair programmer vs. Programming Buddy
- Clinical diagnostic AI
  - Diagnoser vs. Disease predictor / recommender vs. Advisor vs. Data interpreter vs. AI assistant
- Driverless self driving car vs. self-driving cars
- If multiple confusing / conflicting roles → separate!

Roles of humans and AI

Human

- Functional: User, Information processor, Consumer

- Social: Companion, Tutor/therapist/coach, Learner, Coworker/partner, person/protagonist

Computer / Machine / AI

- Functional: Tool, Information factory (process/produce), Oracle, Product/service

- Social: Companion, Tutor/therapist/coach, Learner, Coworker/partner, person/protagonist (chess playing)

Designing systems for these roles is hard!

- Each role has different expectations
- Behaviors, errors (and explaining when something is wrong), interactions, personification/embodiment
- Different social norms out of different roles in society
  - AI simply plays the same role a human plays/played
- Later in this course:
  - Eliciting user expectations, choosing appropriate role, designing for it, evaluation, ethical/moral considerations

Social interactions

- Social interaction → everyday exchanges that shape meaning and behavior (typically, human-human)
- When AI is in the mix → human-human / human-AI / AI-AI
- Differences as well as similarities:
  - Human-human vs. human-AI interaction
- Roles, norms, identity, impression, identity, reciprocity, cues, …
  - Trust, fairness, bias, appropriateness
- Organization & governance → accountability, authority, hierarchy, agency, division of labor & responsibility, transparency
- Deviance, social order & control, crimes/accidents, policy
- More on this in the coming weeks!

Socialization

- Socialization → lifelong process of learning norms, roles, and values through interaction
  - How humans function in the society ←→ how society functions
  - Important for long-term use & effects
- Grammarly for rewrites and edits becomes part of culture
  - Just like google search / maps have become
  - “Digital natives”, etc.
- Different across different role groups / social groups / contexts
  - Group of clinical expert advisors (AI is one of them)
  - Expert and AI assistant
  - A person (as diner) x robot waiter vs. Same person x robot companion
- Needs careful consideration at start and evaluation over time
  - Resocialization → letting go of old ways and learning new ones
  - E.g., roads with self-driving cars in the mix

In summary…

- Human aspects in AI → psychological & sociological
  - People view computers as social actors even when they it's a computer
  - Always important, sociological more so in the time of AI
- Sociology → study of groups & the interactions within
  - Add AI / replace humans with AI and we have a new group / society
- This society evolves, norms for people & AI changes
- Central to how we design AI, consider long-term issues, make policy, etc.
- Broad brush of ideas / aspects of sociology of relevance to AI
- Coming weeks, we will drill more into these!

Readings

- Emerging Roles and Relationships Among Humans and Interactive AI Systems
- Computers are social actors: https://dl.acm.org/doi/pdf/10.1145/191666.191703
- Optional additional reading to see how at some point this became less important:
  - https://dl.acm.org/doi/pdf/10.1145/2468356.2468510