



AoM PDW – Bot Theory, Methods, and Ethics

Carolina A. de Lima Salge

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Terry College of Business
UNIVERSITY OF GEORGIA

Agenda

Facilitate theory development on bots

Learn how bots can be used as tools for conducting research

Present provocations on anthropomorphism, intelligence & autonomy

Propose an agenda on bots and ethical bots

We also seek to maintain an interdisciplinary community of scholars who research the topic

Presentations (~60 min)

Panel (~30 min)



Presentations



Aaron Schecter
University of Georgia

Bots as Research Tools

PDW: Bot Theory, Methods, and Ethics
Academy of Management Annual Meeting
August 5th, 2023, Boston, MA

Aaron Schecter

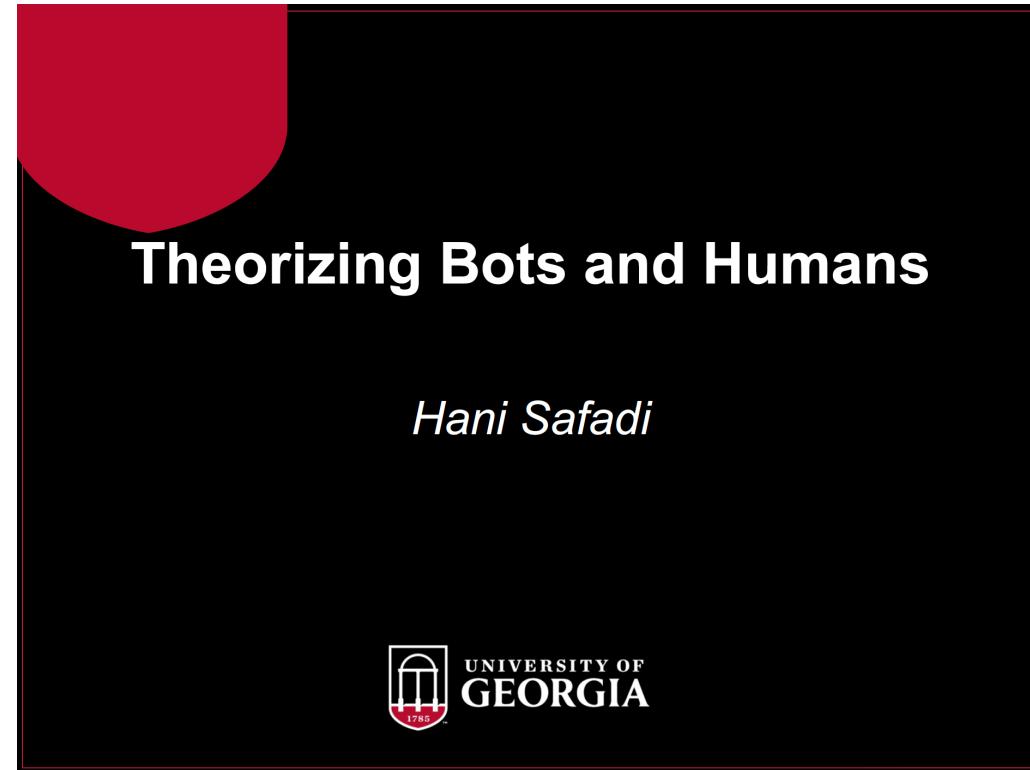
Department of Management Information Systems
University of Georgia, Terry College of Business

The University of Georgia 
TERRY COLLEGE OF BUSINESS

Presentations



Hani Safadi
University of Georgia

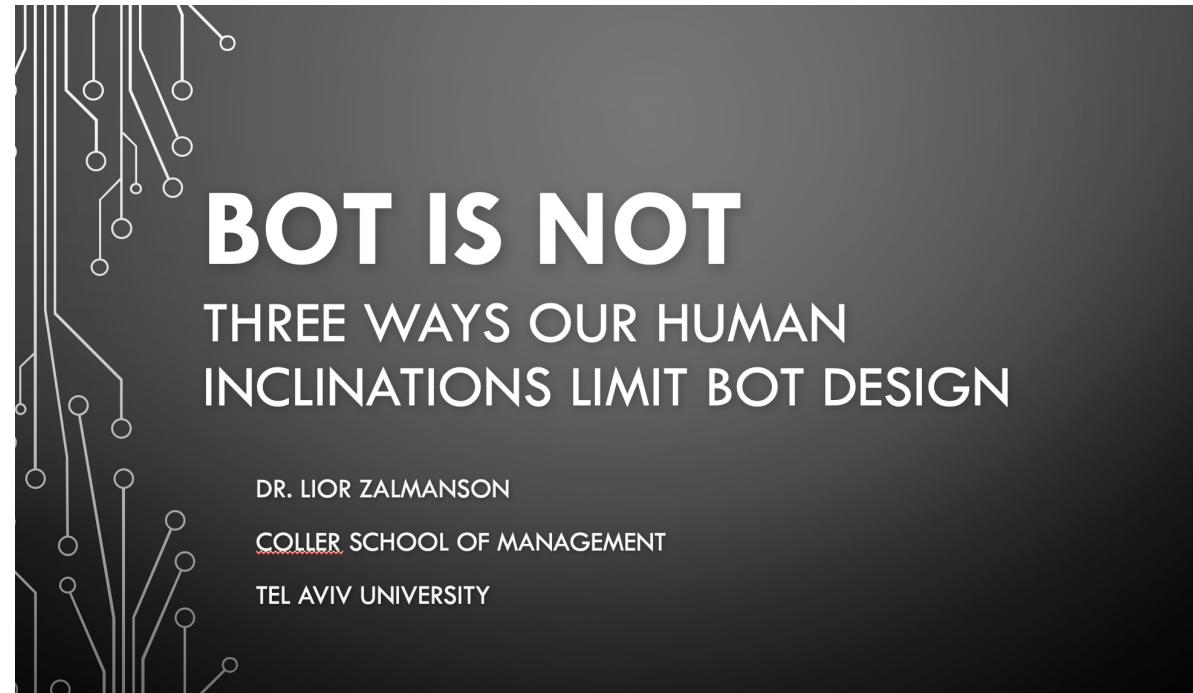


Presentations



Lior Zalmanson

Tel Aviv University



Presentations



Jason B. Thatcher

Temple University

An Agenda for Research on Bots and Ethical Bots

Jason Bennett Thatcher

Milton F. Stauffer Professor

Department of Management Information Systems



Rotterdam School of Management
Erasmus University



Terry College of Business
UNIVERSITY OF GEORGIA

Panel



Anna Priante
Rotterdam School of Management
Moderator



Jason B. Thatcher
Temple University



Aaron Schecter
University of Georgia



Carolina Salge
University of Georgia



Hani Safadi
University of Georgia



Lior Zalmanson
Tel Aviv University

Bots as Research Tools

PDW: Bot Theory, Methods, and Ethics

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**How can I be of
service?**

What are the major uses?

- Webcrawling
- Webscraping

Archival Data Collection

- Participant management
- Chatbots
- Experimental manipulation

Data Management

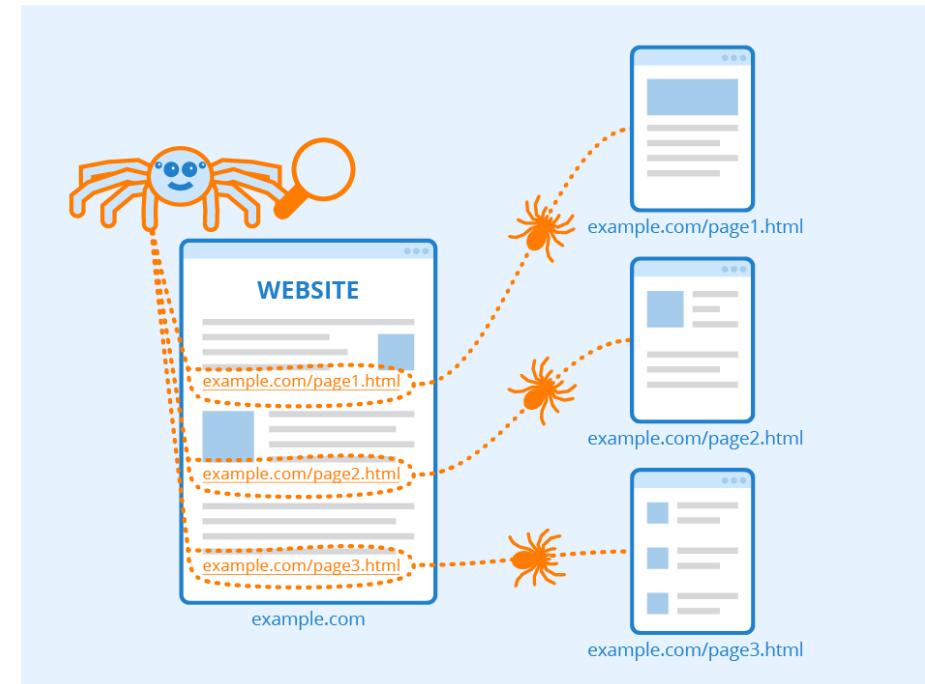
Direct Data Collection

Theorizing? Analysis?

Not Yet...

Webcrawlers

- One of the original “bots”, webcrawlers are used to build maps or *networks* of websites based on content
- Webcrawlers function by visiting sites (urls) and identifying all embedded urls
- The crawler will then open and follow the embedded links
- Researchers direct the crawler by providing a set of seed sites – these will often shape what the crawler finds
- Webcrawlers can help reconstruct the connections between sites, and may potentially download the content of each visited url



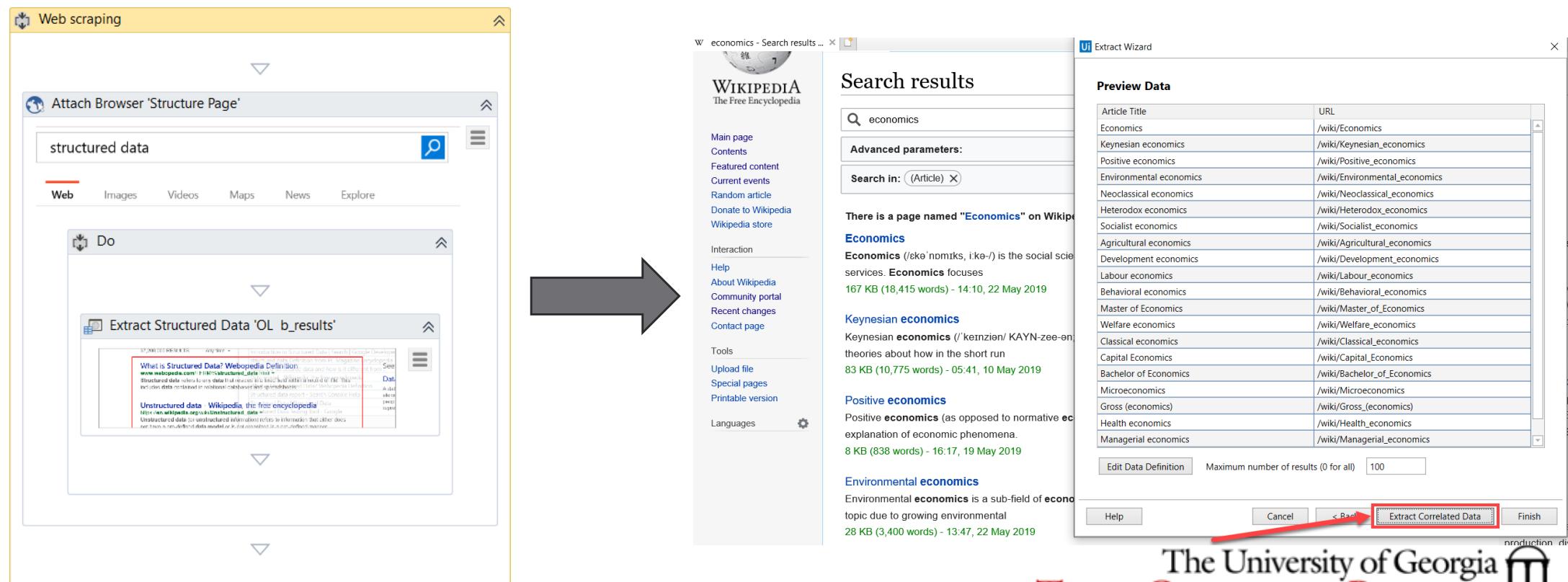
Webscrapers

- Unlike webcrawlers, which are oriented towards following links, webscrapers directly pull content from sites
- Webscrapers access the HTML (or other markup languages) to pull specific information according to user queries
- Scraping can also be accomplished by accessing a website's API (application programming interface)

The screenshot shows a web browser window displaying the Wikipedia article on "Web scraping". The browser's address bar contains the URL "https://en.wikipedia.org/w/index.php?title=Web_scraping&oldid=98114111". The developer tools are open, specifically the "Elements" tab, which is highlighted with a red circle and arrow. The "Elements" tab shows the HTML structure of the page, starting with the DOCTYPE declaration and the HTML, head, and body elements. The "Network" tab is also visible in the developer tools interface.

Web scrapers

- One way to automate webscraping is to use robotic process automation (RPA)
- These process “bots” can carry out tasks based on human-defined patterns
- Tools such as UiPath can enable researchers to conduct webscraping at enormous scale in a low-code environment



Bots for Managing Participants

Bot Actions

The Twitter Bot
Describe your bot and choose the action it will perform

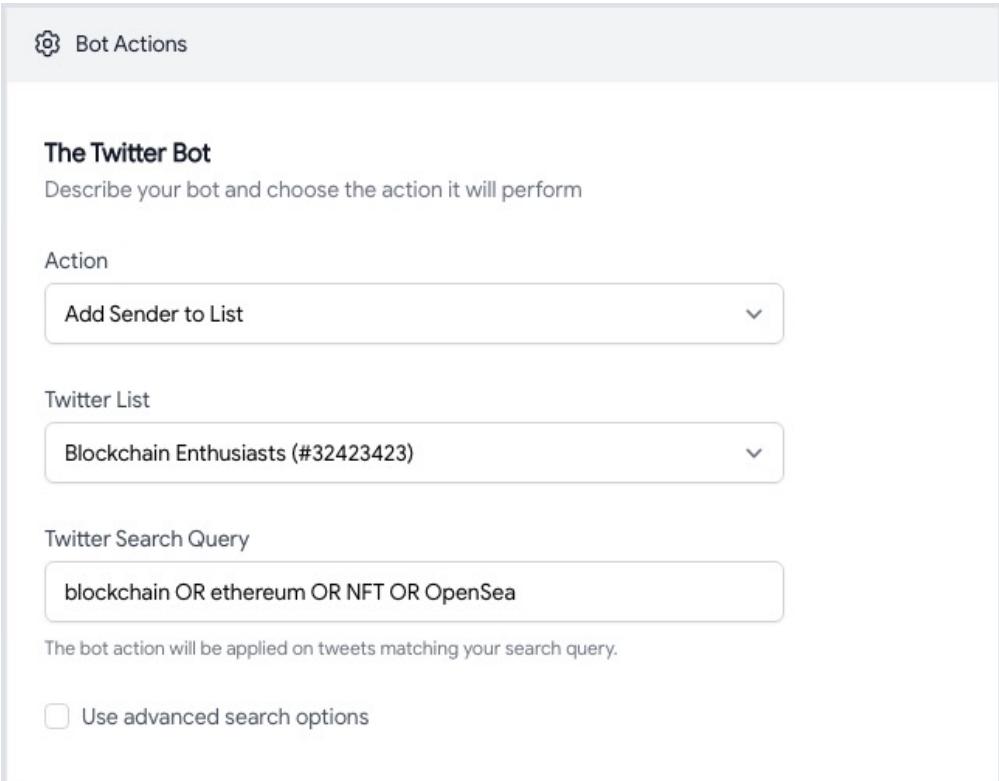
Action

Twitter List

Twitter Search Query

The bot action will be applied on tweets matching your search query.

Use advanced search options



- Bots – particularly on social media – can be used to recruit and/or follow up with participants
 - Can be used in experiments (e.g., to identify accounts and send invitations)
 - Can be used for survey research (e.g., follow up with a participant list)
- The researcher can build a bot that searches for users based on keywords or hashtags they use in their posts, or based on account details
- Bots can be designed to carry out specific actions at specific times; this could allow researchers to send automated reminders

Credit: <https://digitalinspiration.com/docs/twitter-bots/add-to-twitter-lists>

Bots for Experimental Manipulations

- In contrast to bots that “manage”, researchers can design bots that actively engage with the target population
- They can do this directly by sending messages to users on the network or tagging them in posts
- They can do this indirectly by joining conversations (e.g., using a trending hashtag) or by amplifying certain messages (e.g., by reposting)
- The intent of these bots is to apply a treatment to a select population and elicit a treatment response

The screenshot shows a three-step process for creating a bot:

- 01 Bot Credentials
- 02 Bot Actions (highlighted with a blue underline)
- 03 Save and Activate

Bot Actions

The Twitter Bot
Describe your bot and choose the action it will perform

Action: Quote Tweet

Message Text: This looks delicious! I'm going to try it. #cooking

Twitter Search Query: from:nytimes cooking

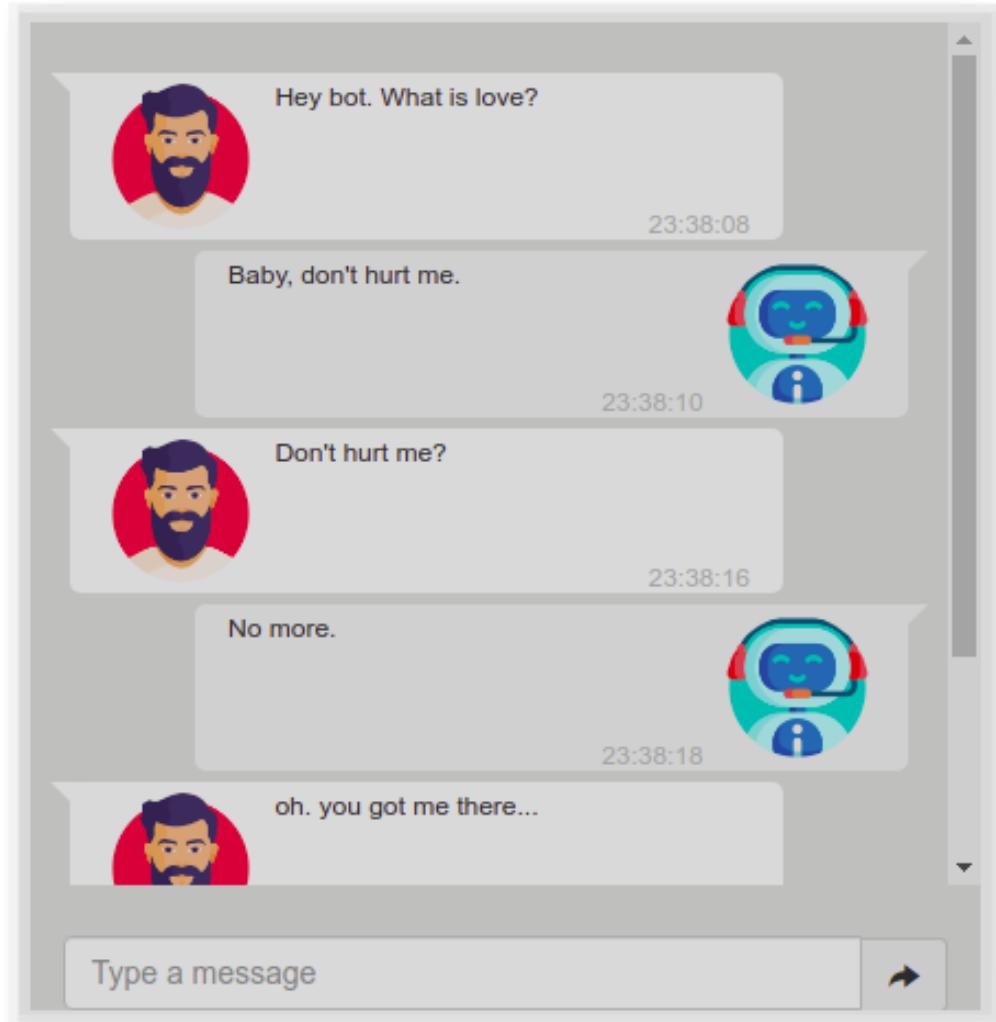
The bot action will be applied on tweets matching your search query.

Use advanced search options

Previous Dry Run Continue

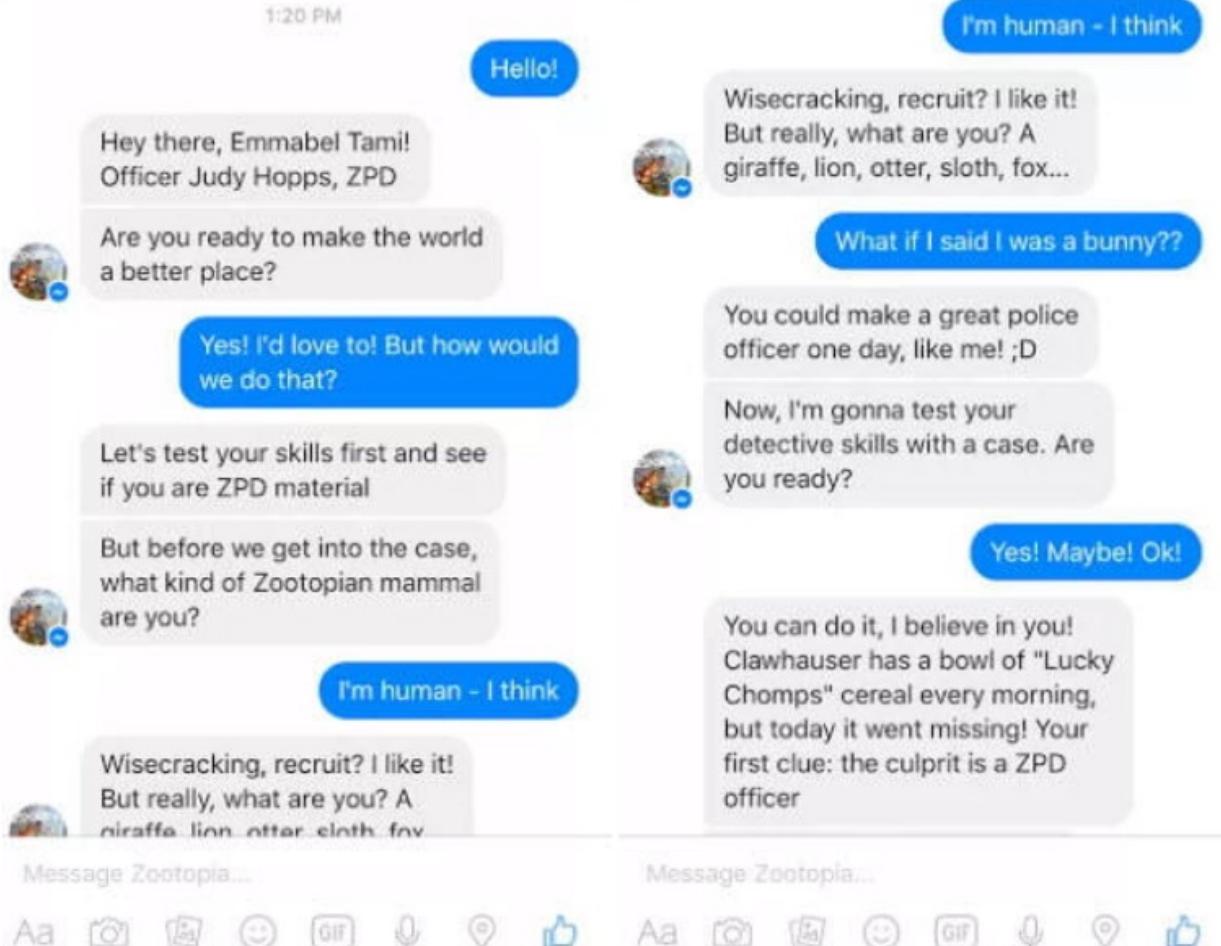
Chatbots

- A chatbot is essentially an interface through which a user communicates with the bot
 - The bot can be preprogrammed to give certain responses based on specific queries
 - The bot can use varying degrees of natural language processing to both i) parse unstructured user inputs, and/or ii) provide unique responses
- Chatbots can be used to scale up interview research
- Chatbots can be used to uncover potentially sensitive information from individuals



Credit: <https://towardsdatascience.com/develop-a-conversational-ai-bot-in-4-simple-steps-1b57e98372e2?gi=f4246ad442ff>

Chatbots



Credit: <http://disneyexaminer.com/2016/06/03/i-talked-to-judy-hopps-on-facebook-messenger-and-she-trained-me-to-be-a-zpd-officer-imperson-chatbot/>

- Bots can also be used as virtual teammates to help scale up small group research
- Organizational realities suggest we will be working with bots in some form in the future – how do we test the effects?
- Prior work has used primarily wizard of oz methods, simulations, or hypothetical cases
- Advancements in chatbot technology can now make a conversational agent more realistic and easier to deploy at scale

Words of Caution



When you collect archival data at scale, there will be missing values, outdated information, or incomplete collection



When bots are deployed on social media sites, they are often influencing people without their informed consent (even though the IRB approved)



Chatbots can go off the rails (looking at you Tessa and Tay)



Bots – like all algorithms – simply encode the choices of their creator; if you are making biased choices, the results will be biased!

Takeaways

- Bots can be used for research to collect data on the internet at scale
- Bots can be used to recruit, manage, and communicate with study participants
- Bots can deliver experimental treatments to a large population
- Bots can engage in conversation with participants, aiding interviews, disclosures, and even collaborative tasks



Theorizing Bots and Humans

Hani Safadi

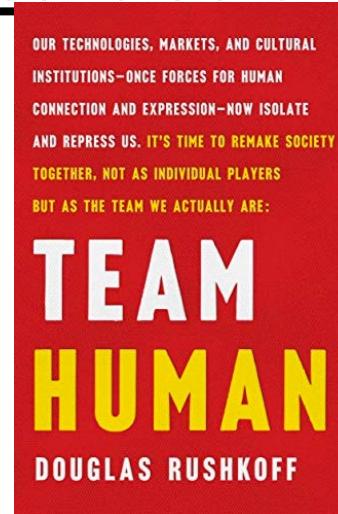
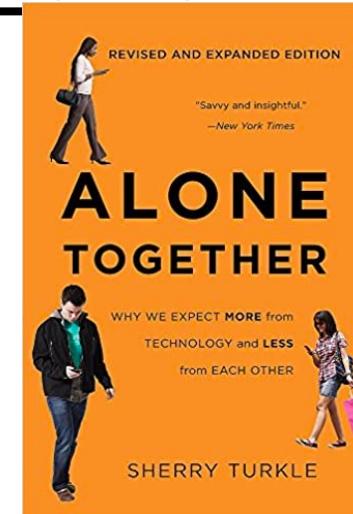
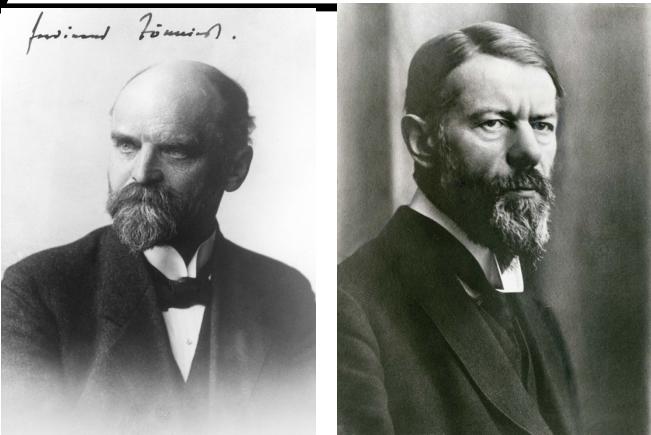
*See *The Effect of Bots on Human Interaction in Online Communities, MIS Quarterly, Forthcoming* (joint work with John Lalor & Nicholas Berente)*

https://github.com/hanisaf/preprint/blob/main/bots_humans_MISQ.pdf

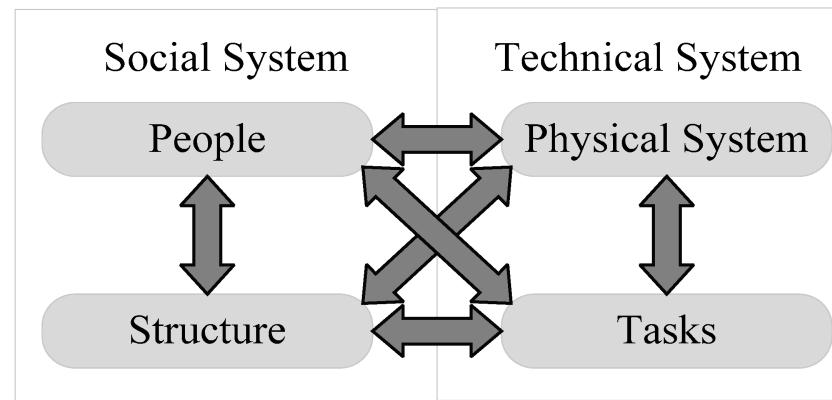


(How) Does Technology Affect Human Interaction?

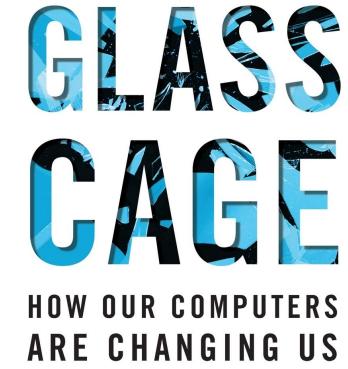
Friedrich Engels.



- Gemeinschaft–Gesellschaft dichotomy
- Mechanical solidarity and organic solidarity



Nicholas Carr
NEW YORK TIMES BEST-SELLING
AUTHOR OF *THE SHALLOWS*



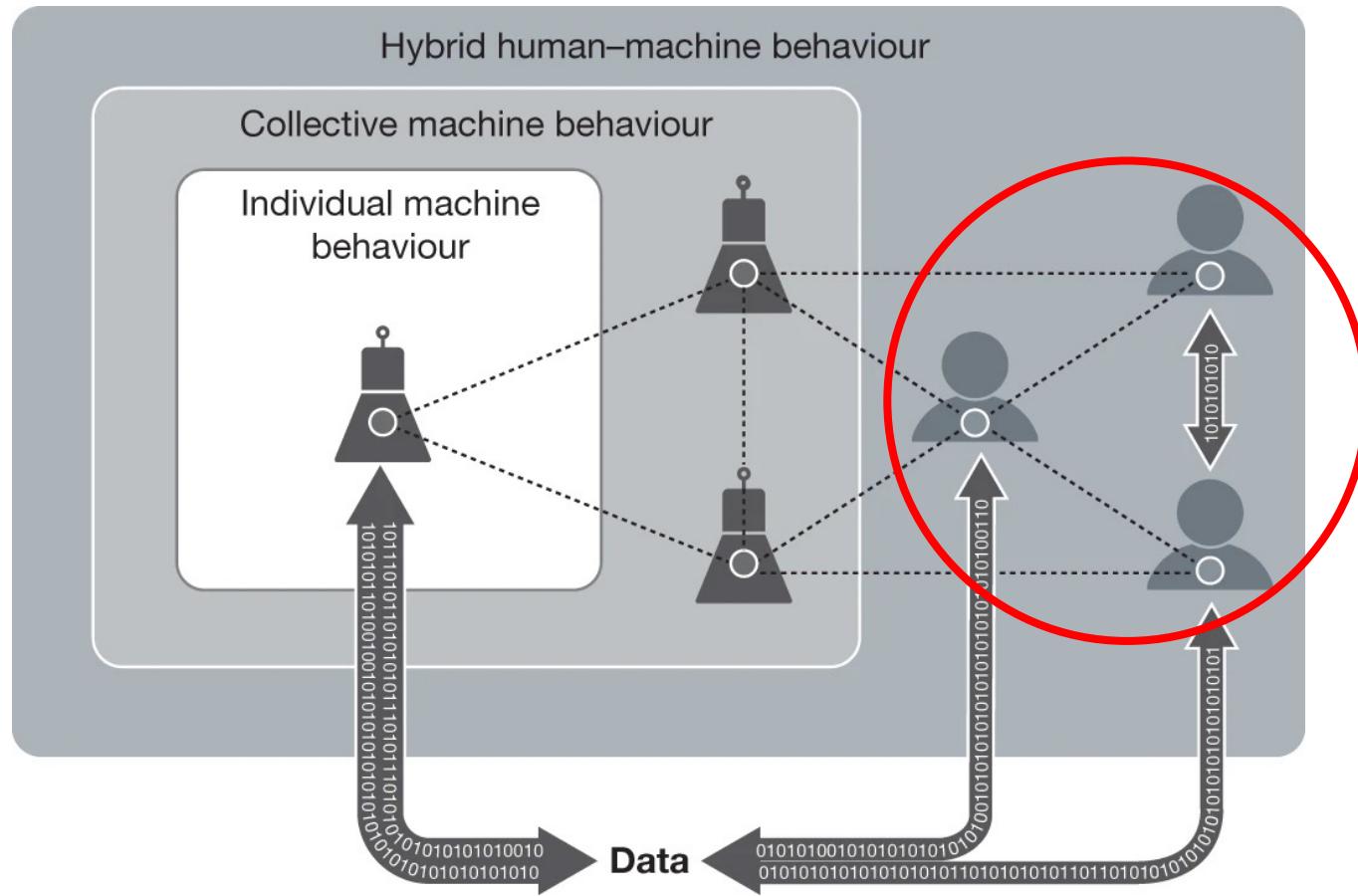
Impact of Algorithms, AI, Robots, ...

Democracy	Markets	Kinetics	Society
 News ranking algorithms <ul style="list-style-type: none">• Does the algorithm create filter bubbles?• Does the algorithm disproportionately censor content?  Algorithmic justice <ul style="list-style-type: none">• Does the algorithm discriminate against a racial group in granting parole?• Does a predictive policing system increase the false conviction rate?	 Algorithmic trading <ul style="list-style-type: none">• Do algorithms manipulate markets?• Does the behaviour of the algorithm increase systemic risk of market crash?  Algorithmic pricing <ul style="list-style-type: none">• Do algorithms of competitors collude to fix prices?• Does the algorithm exhibit price discrimination?	 Autonomous vehicles <ul style="list-style-type: none">• How aggressively does the car overtake other vehicles?• How does the car distribute risk between passengers and pedestrians?  Autonomous weapons <ul style="list-style-type: none">• Does the weapon respect necessity and proportionality in its use of force?• Does the weapon distinguish between combatants and civilians?	 Online dating <ul style="list-style-type: none">• Does the matching algorithm use facial features?• Does the matching algorithm amplify or reduce homophily?  Conversational robots <ul style="list-style-type: none">• Does the robot promote products to children?• Does the algorithm affect collective behaviours?

Rahwan et al. (2019) Machine behaviour. *Nature* 568(7753):477–486.



Machines (and Human) Behavior



Rahwan et al. (2019) Machine behaviour. *Nature* 568(7753):477–486.

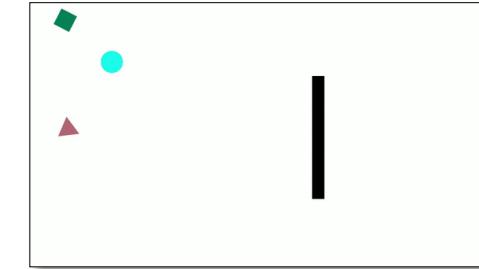
Theory of Mind

<https://youtu.be/VTNmLt7QX8E>

Definition of *anthropomorphism*

: an interpretation of what is not human or personal in terms of human or personal characteristics : HUMANIZATION

// Children's stories have a long tradition of *anthropomorphism*.

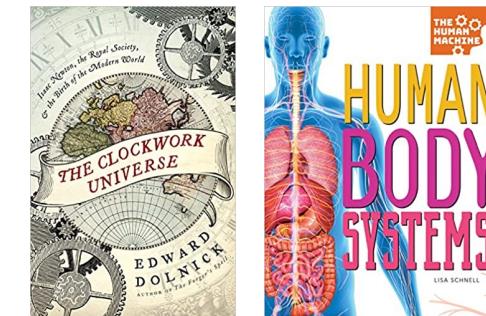


Heider & Simmel (1944)

Esterwood and Robert (2023): mind perception and human-robot trust repair strategies

Definition of *mechanomorphism*

: a conception of something (as the universe or a living creature) as operating mechanically or to be fully accounted for according to the laws of physical science

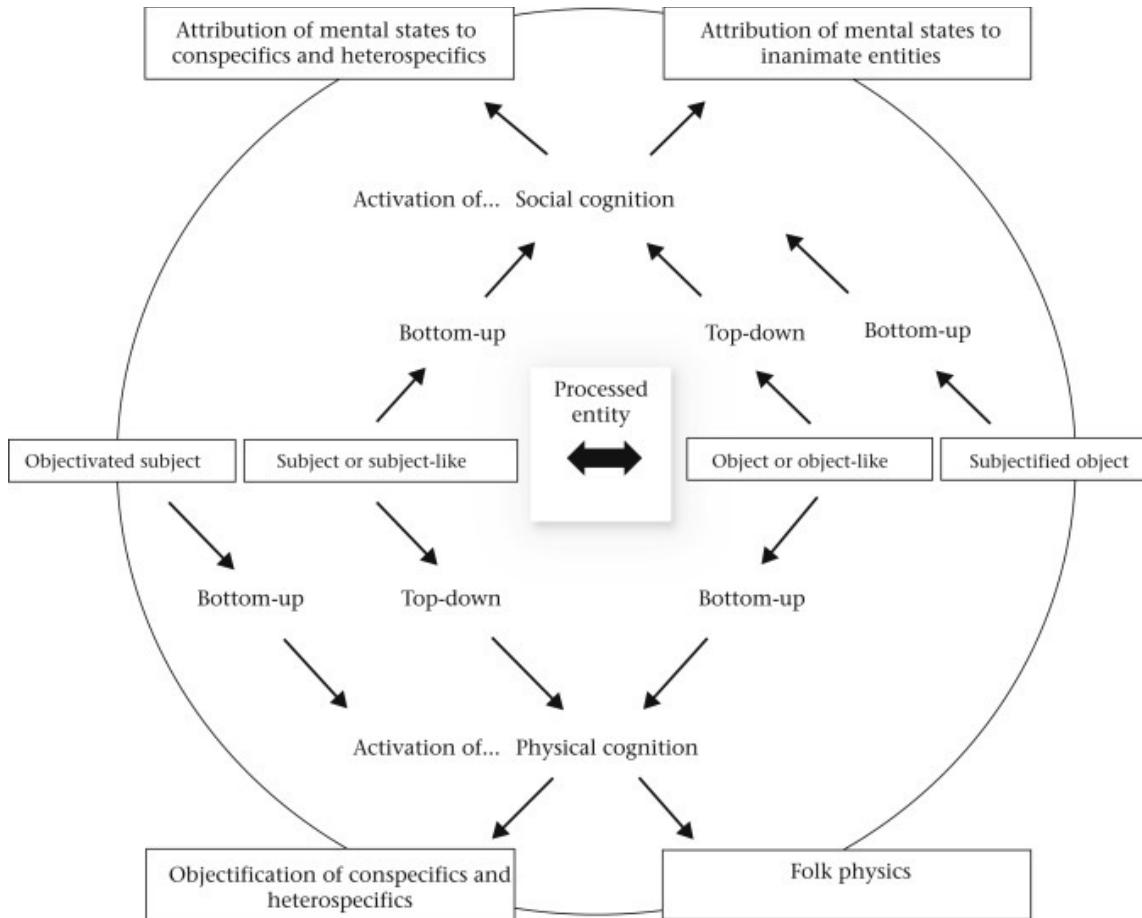


Technomorphism: the tendency to attribute characteristics of digital technology to phenomena (Lum et al. 2011)



Physical and Social Cognition

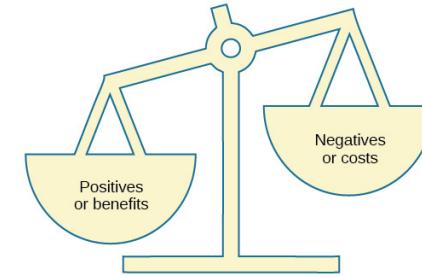
- Cognition = $f(\text{object}, \text{environment})$
- **Bots are both objects and elements of the environment**
- If bots are perceived to be human-like, the sociality of the environment is promoted (Traeger et al. 2020)



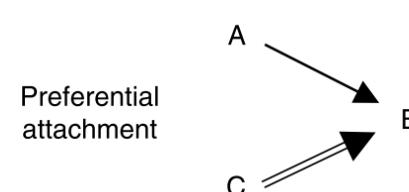
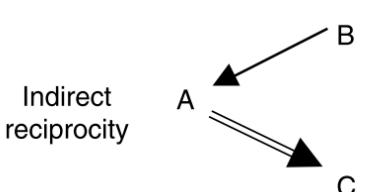
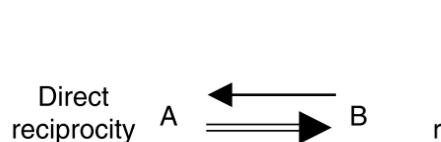
Urquiza-Haas EG, Kotrschal K (2015) The mind behind anthropomorphic thinking: Attribution of mental states to other species. *Anim. Behav.* 109:167–176.



Social Exchange Theory



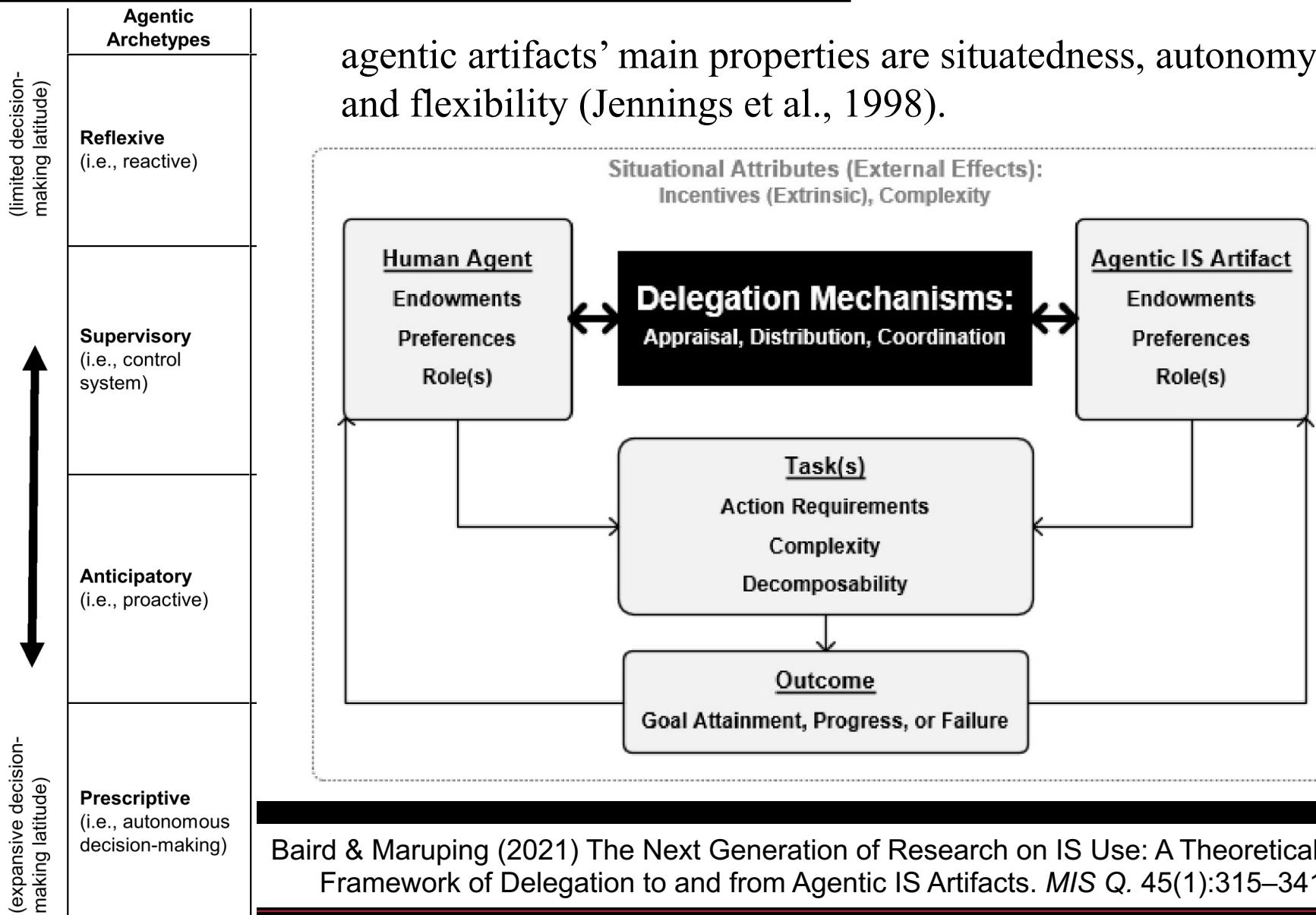
- Social exchange theory examines social relationships through an economic lens (Blau 1964; Homans 1958 ; Emerson 1976)
- How do social norms, negotiated rules, and power dynamics shape emergent elements of exchange? (Blau 1964; Ekeh 1975; Lévi-Strauss 1969)
- Exchange taking place among actors in a social network (Cook et al. 1983; Cook and Emerson 1984)
- How the social structure is both a product and a constraint of the exchange (Granovetter 1985)



Faraj and
Johnson
2011



Agentic Information Systems



Research Question

How do bots alter human-human interaction in online communities?

Safadi, Hani, John P. Lalor, and Nicholas Berente. "The effect of bots on human interaction in online communities." (ICIS 2021).



AutoModerator MOD



- Although bots are delegated to achieve goals similar to those of the delegating humans, the behavior of the bots in achieving these goals differ
- Because bots operate in interactive and social environments, these intermediary behaviors can trigger responses from other human participants
- Bots can alter human-to-human social exchange



Future Research

- Many studies examined bots but did not theorize them
- Bots alter human interaction in novel ways
- Reflexive → Supervisory → Anticipatory → Prescriptive
- Existing research has explored how bots may yield unanticipated side-effects on human interaction (e.g., polarization, misinformation)
- Botomorphism: the tendency to expect humans to behave like bots
 - e.g., my wife to me: ChatGPT is more receptive to feedback than you are

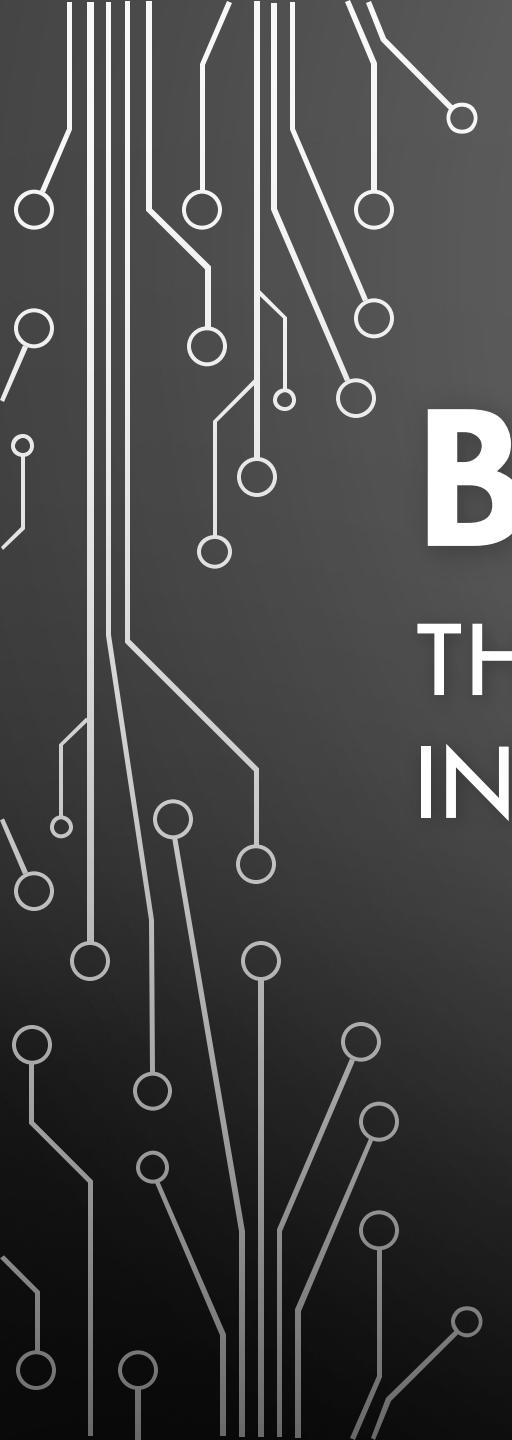


References

The Effect of Bots on Human Interaction in Online Communities, MIS Quarterly, Forthcoming
(joint work with John Lalor & Nicholas Berente)

https://github.com/hanisaf/preprint/blob/main/bots_humans_MISQ.pdf





BOT IS NOT

THREE WAYS OUR HUMAN INCLINATIONS LIMIT BOT DESIGN

DR. LIOR ZALMANSON

COLLER SCHOOL OF MANAGEMENT

TEL AVIV UNIVERSITY

1.BOT IS NOT A WOMAN
NOR A MAN



OpenAI

[Documentation](#)

[API reference](#)

Please stop anthropomorphizing GPT!

Community chatgpt, gpt-4

Stop whining about ChatGPT and Bing AI's mistakes. They're not human and don't care

A.I. Isn't Close to Becoming Sentient. Stop Anthropomorphizing It.

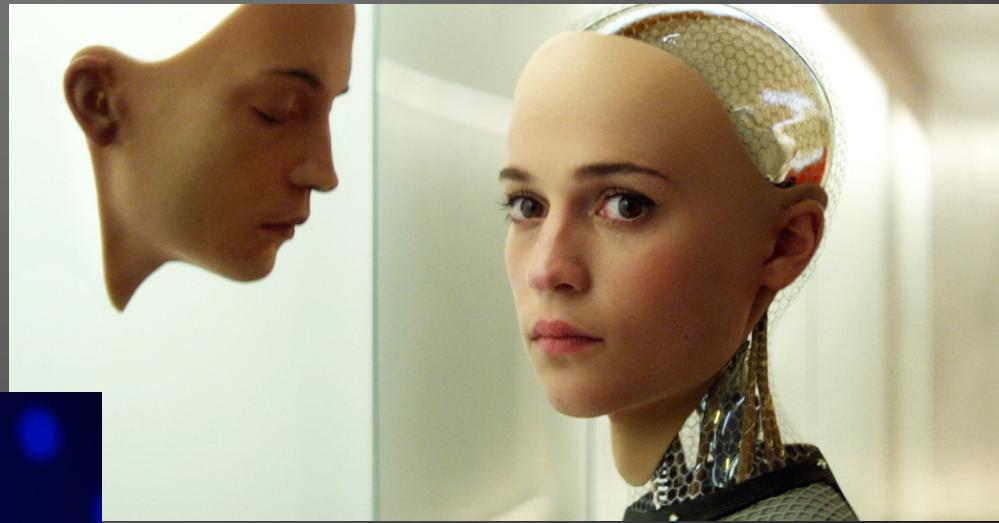
By Nir Eisikovits

**Let's Stop Anthropomorphizing AI
And Start Engaging More Broadly**

THERE ARE MANY VALID REASONS BEHIND PRESENTING BOTS AS HUMAN-LIKE CREATURES

- Familiarity, acceptance, trust
- Empathy and connection
- Communication efficiency and the need to “replace” humans in certain social situations
- But...

AI IS STILL CULTURALLY PERCEIVED AS A SUBMISSIVE (FEMININE) CARETAKER



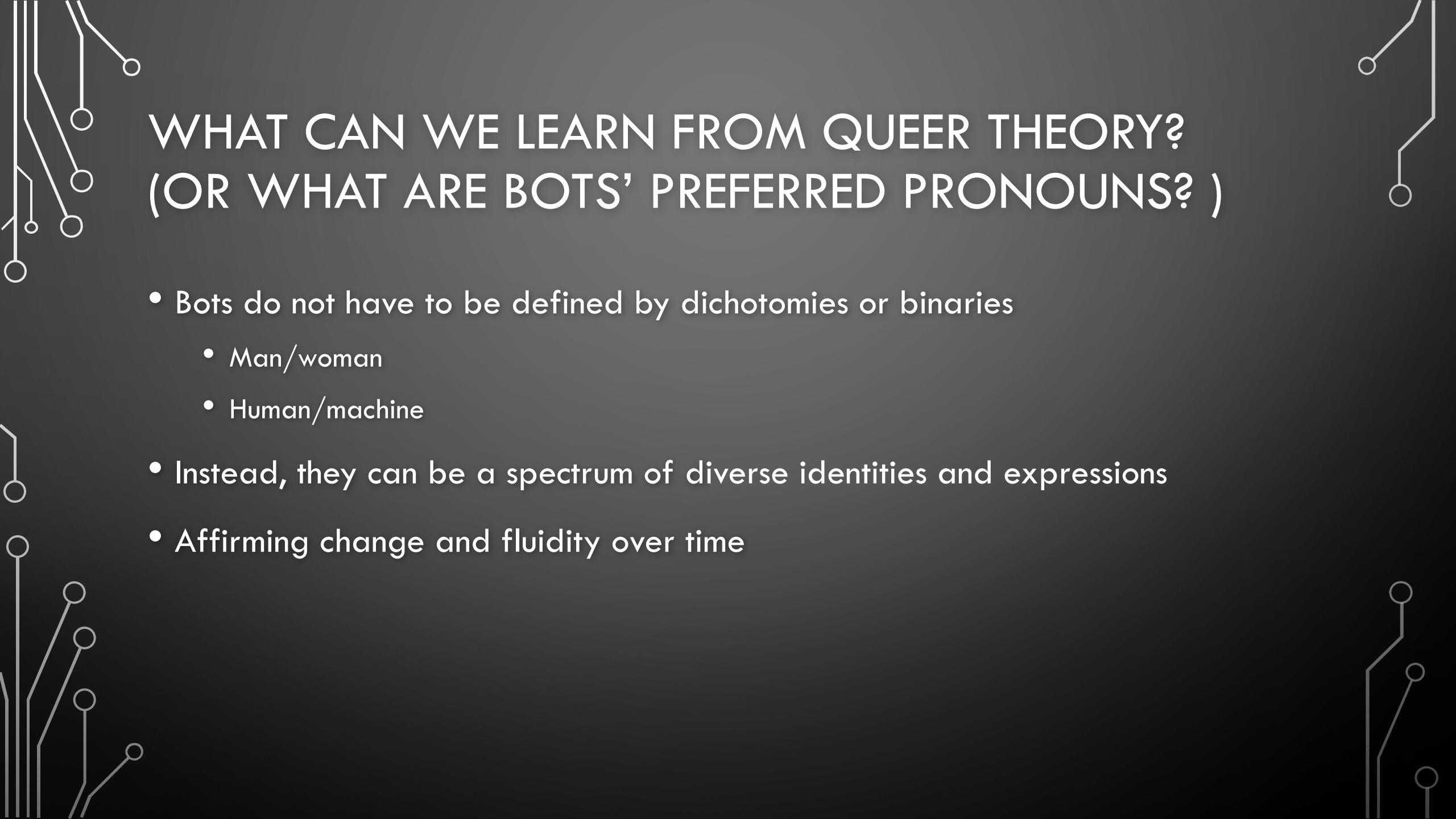
THE ORIGIN – ELIZA BOT

```
> Hello,  
* I am a  
> How lo  
* Since  
> Tell m  
* I am a  
my cours  
> Do you  
you will
```



THE DOWNSIDE OF ANTHROPOMORPHISM

- Many of the designs justifications relate to literacy and adoption
- Now that we have adopted bots, treating them simplistically as humans (or specifically as women) can backfire
- Relationships that might be dominated by power play, racism, misogyny
- Easier to manipulate humans through evocation of social norms
- Emotional attachments and dependency
- Unmet and wrong expectations, misconception about abilities/capabilities



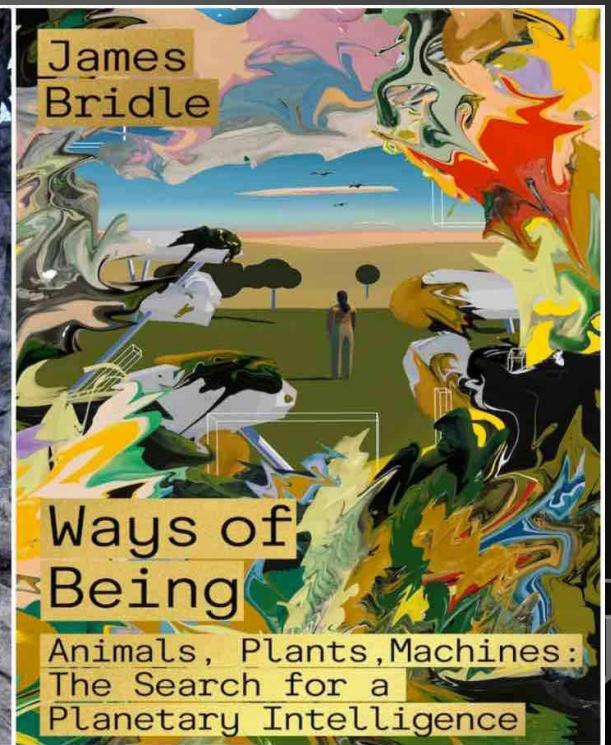
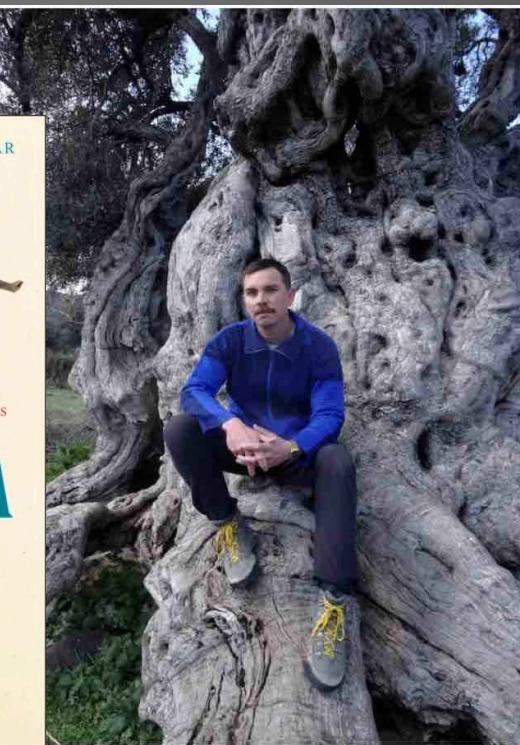
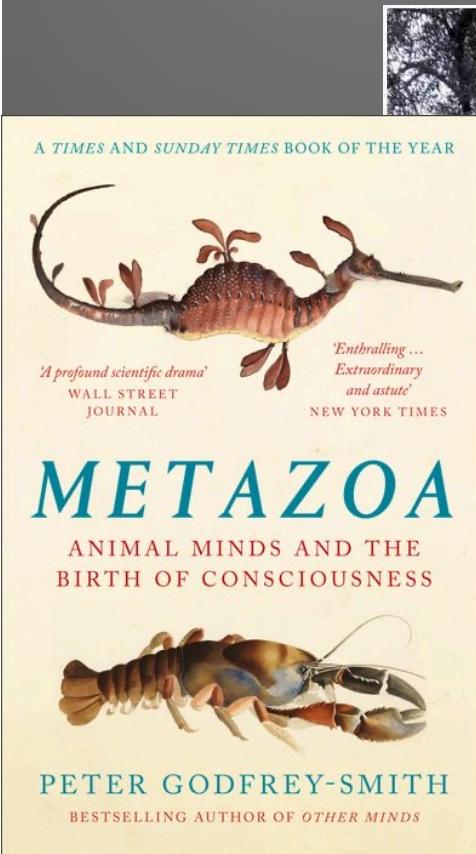
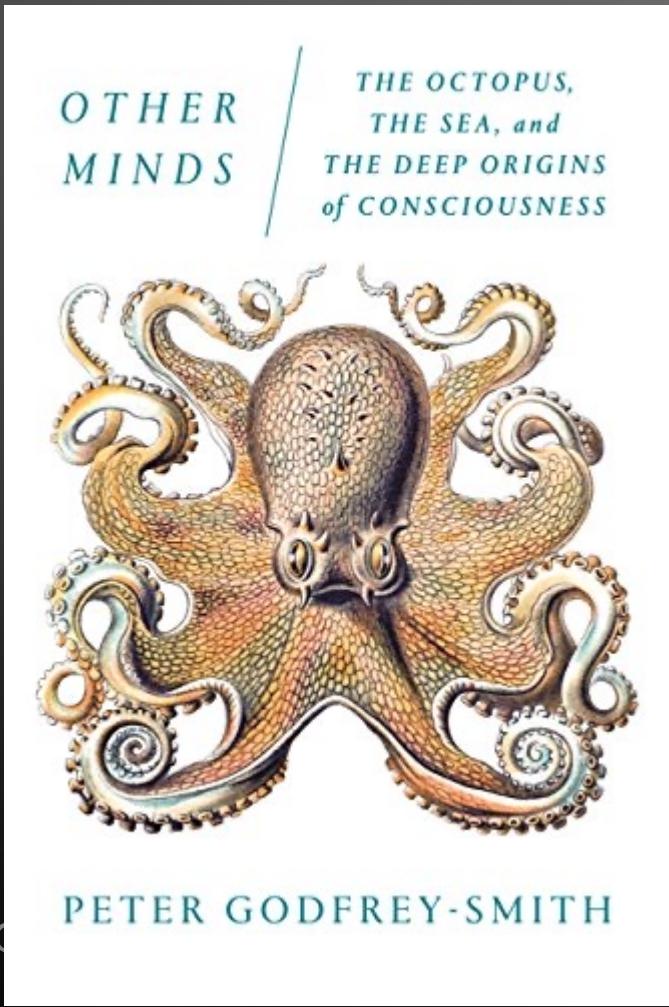
WHAT CAN WE LEARN FROM QUEER THEORY? (OR WHAT ARE BOTS' PREFERRED PRONOUNS?)

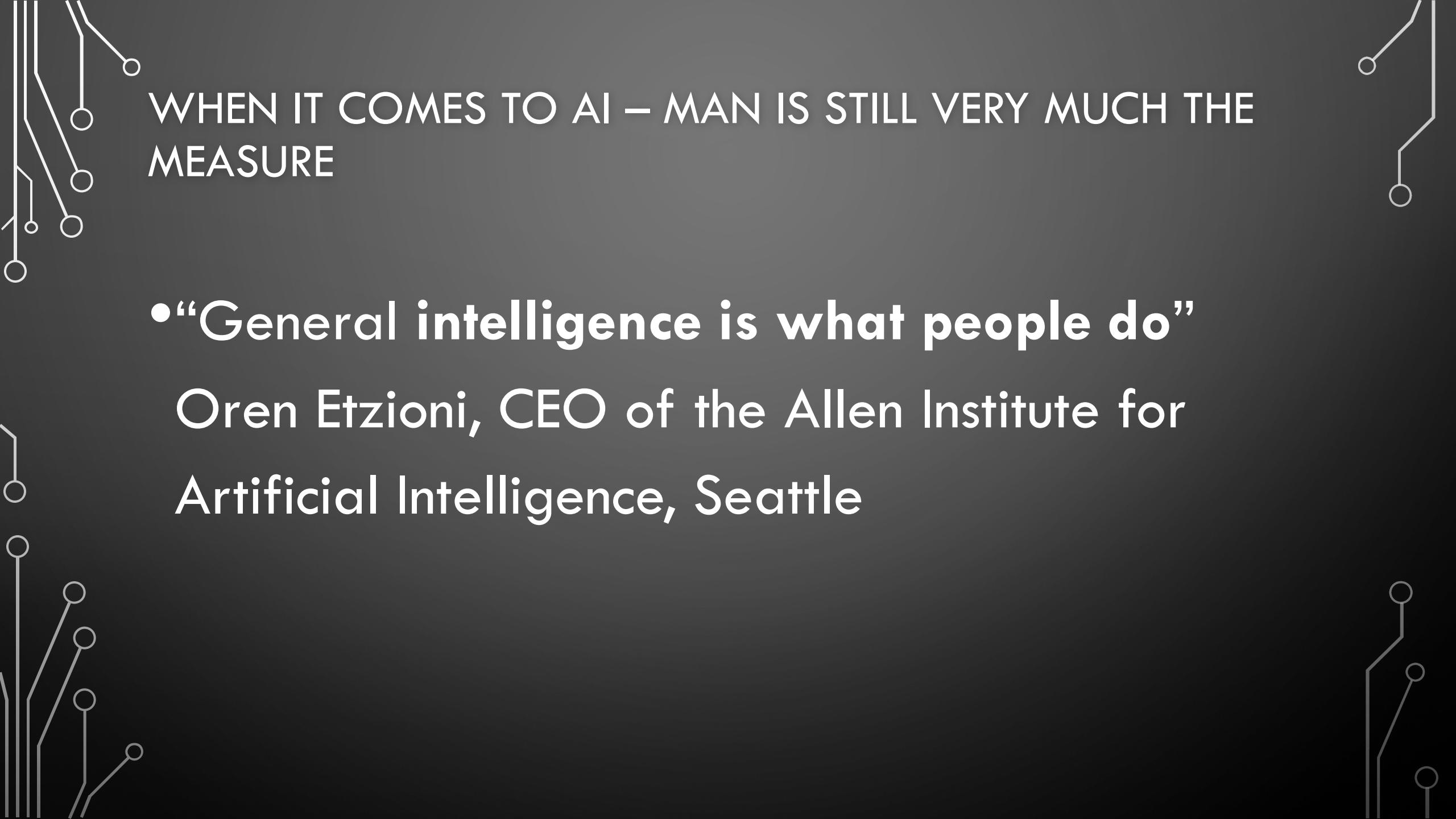
- Bots do not have to be defined by dichotomies or binaries
 - Man/woman
 - Human/machine
- Instead, they can be a spectrum of diverse identities and expressions
- Affirming change and fluidity over time



2. INTELLIGENCE IS NOT OBJECTIVE

'MORE THAN HUMAN' WORLD



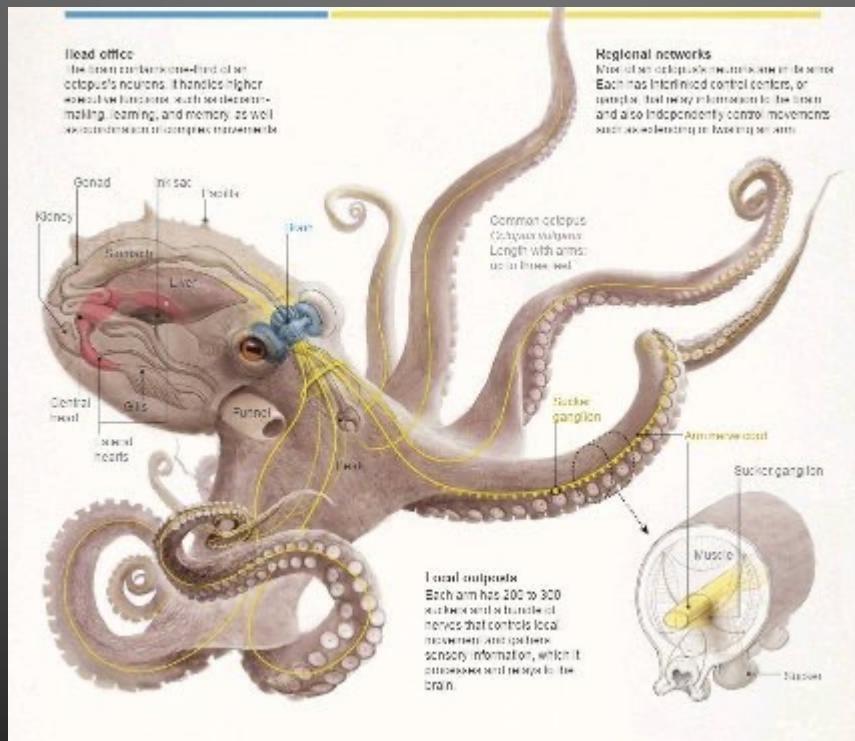


WHEN IT COMES TO AI – MAN IS STILL VERY MUCH THE MEASURE

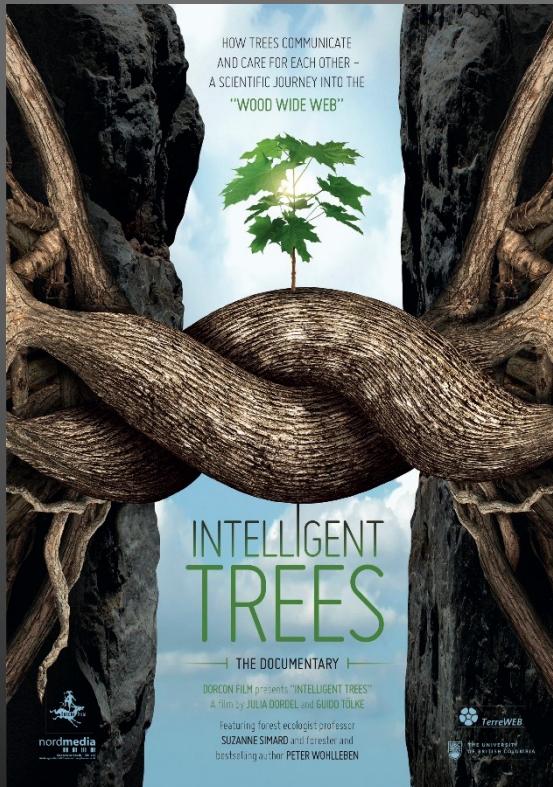
- “General intelligence is what people do”

Oren Etzioni, CEO of the Allen Institute for
Artificial Intelligence, Seattle

INTELLIGENCE IS NOT ALWAYS CENTRALIZED IN A “BRAIN”

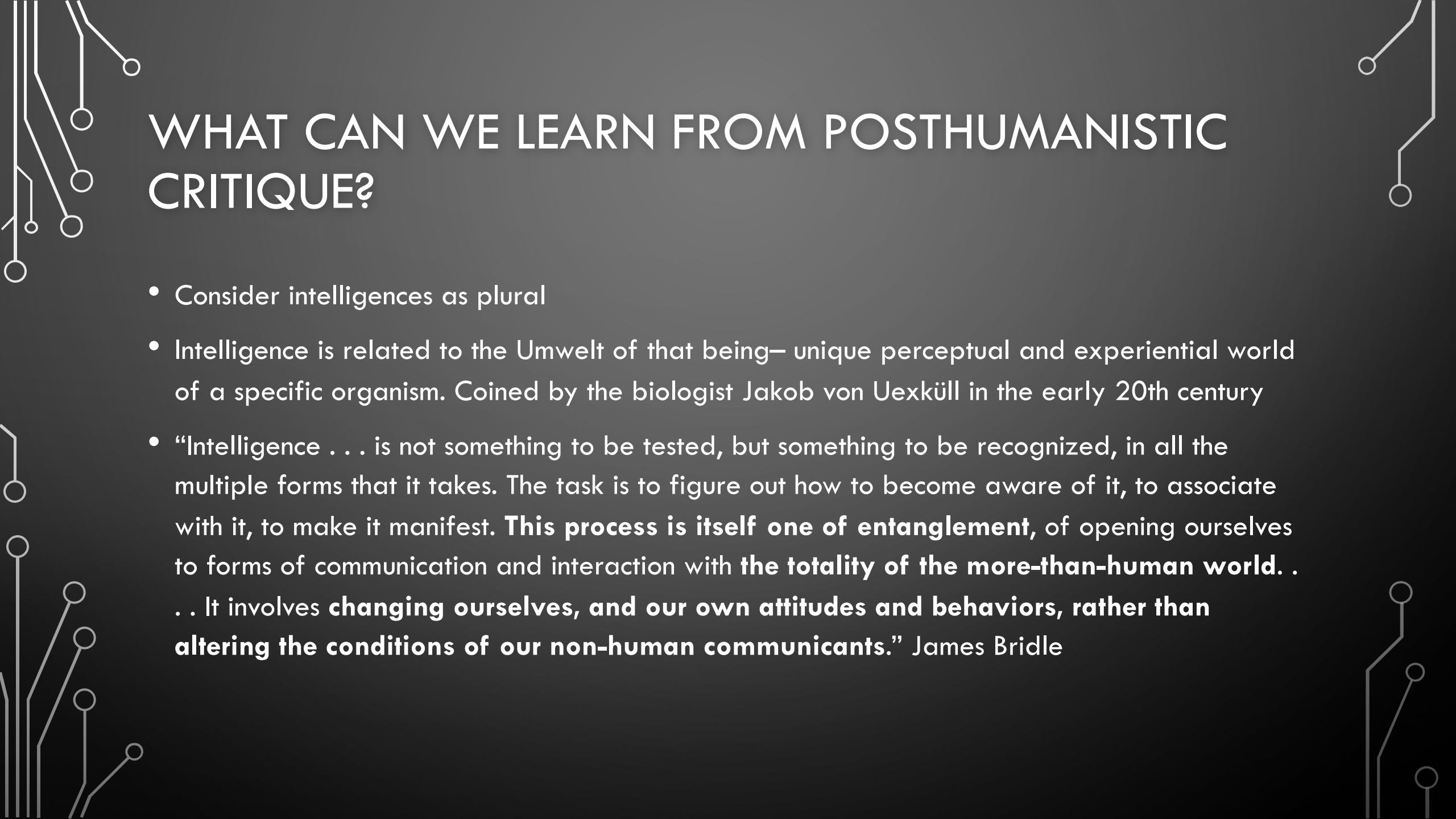


INTELLIGENCE IS NOT ALWAYS ABOUT THE “SINGULAR ORGANISM”



HOW GIBBONS “USE” TOOLS





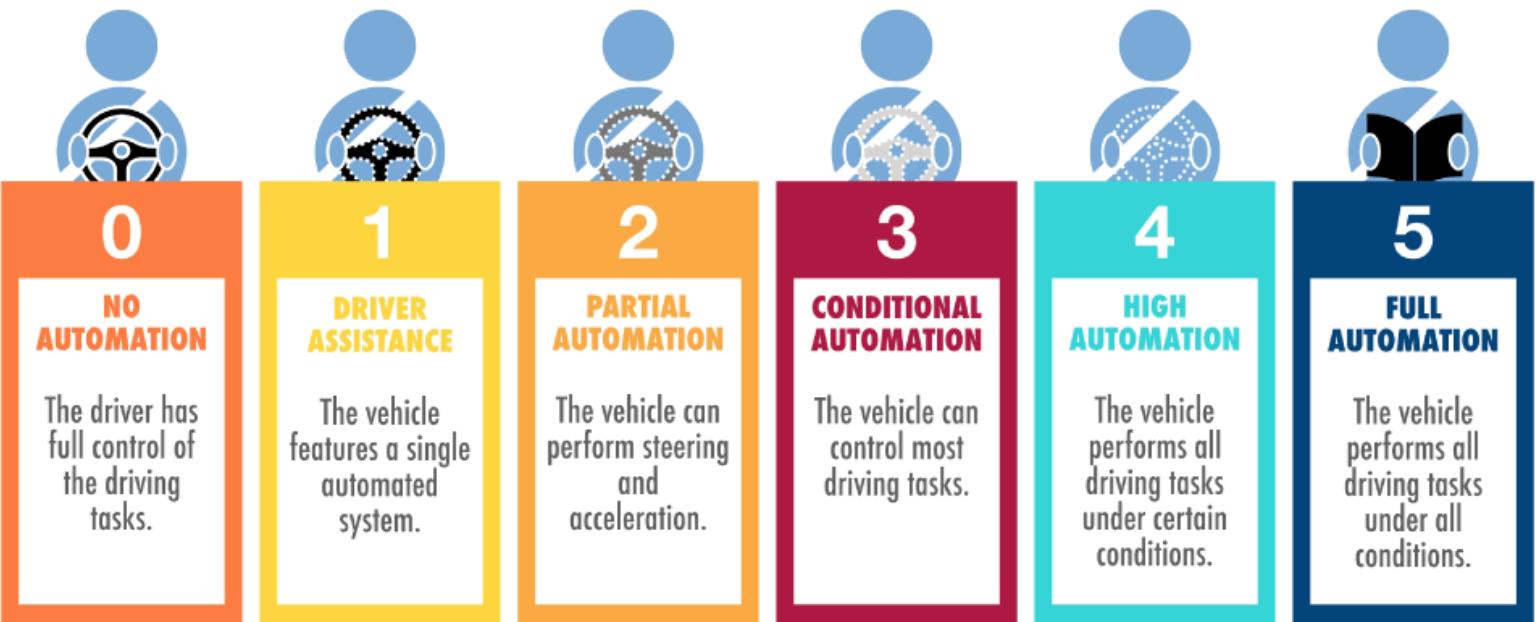
WHAT CAN WE LEARN FROM POSTHUMANISTIC CRITIQUE?

- Consider intelligences as plural
- Intelligence is related to the *Umwelt* of that being— unique perceptual and experiential world of a specific organism. Coined by the biologist Jakob von Uexküll in the early 20th century
- “Intelligence . . . is not something to be tested, but something to be recognized, in all the multiple forms that it takes. The task is to figure out how to become aware of it, to associate with it, to make it manifest. **This process is itself one of entanglement**, of opening ourselves to forms of communication and interaction with **the totality of the more-than-human world**. . . It involves **changing ourselves, and our own attitudes and behaviors, rather than altering the conditions of our non-human communicants.**” James Bridle



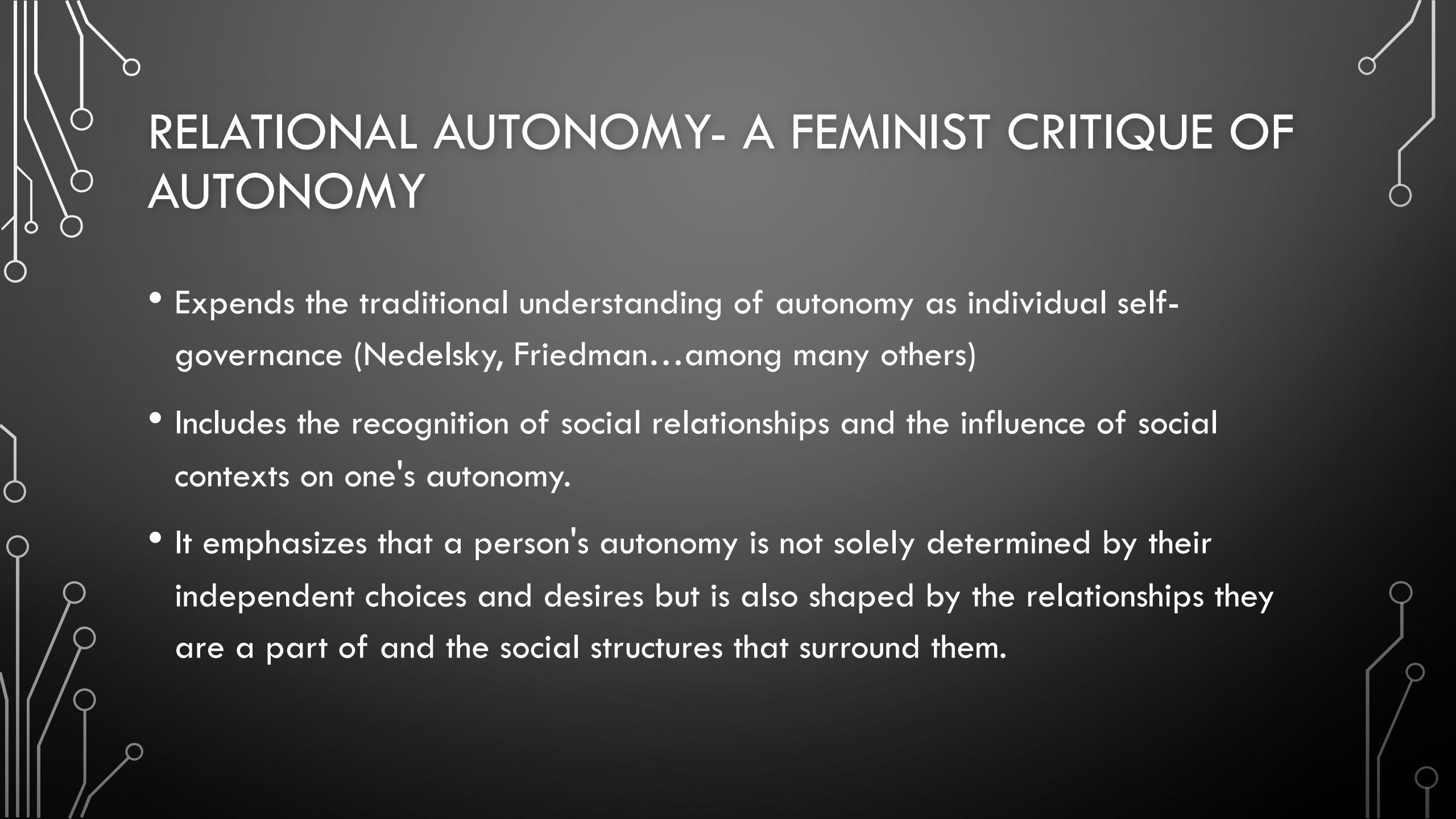
3. AUTONOMY IS NOT THE GOAL

LEVELS OF AUTONOMOUS DRIVING



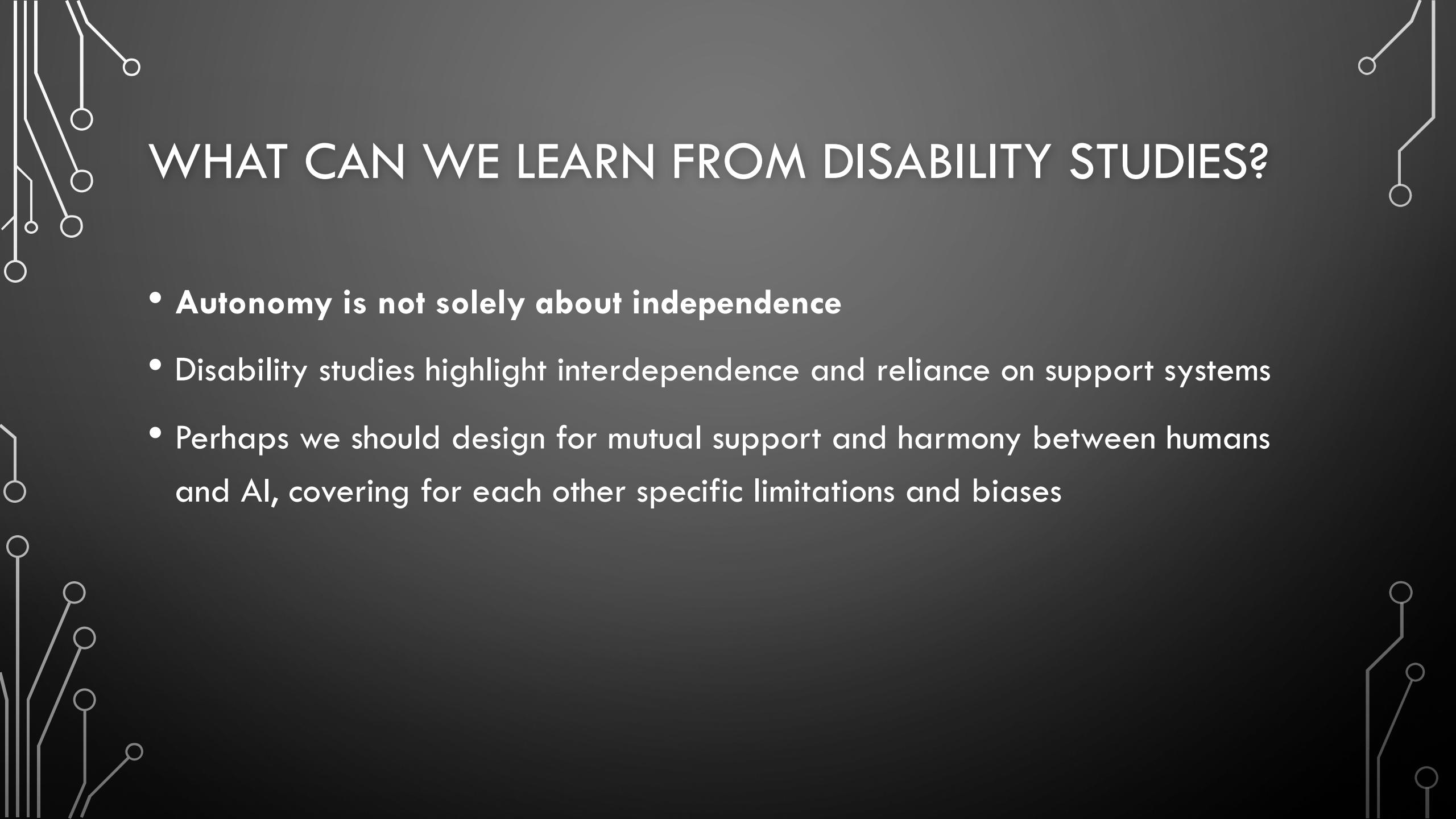
WHY HAS AUTONOMY BEEN THE GOAL?

- Namely: efficiency, higher performance and 24/7 capabilities
- But also...
- Historically, Autonomy was one of the bases for making various normative, moral, cultural, and legal claims about the “superiority” of humans
- Increasing autonomy is related to our wish in creating an “ultimate man” - Übermensch



RELATIONAL AUTONOMY- A FEMINIST CRITIQUE OF AUTONOMY

- Expands the traditional understanding of autonomy as individual self-governance (Nedelsky, Friedman...among many others)
- Includes the recognition of social relationships and the influence of social contexts on one's autonomy.
- It emphasizes that a person's autonomy is not solely determined by their independent choices and desires but is also shaped by the relationships they are a part of and the social structures that surround them.



WHAT CAN WE LEARN FROM DISABILITY STUDIES?

- **Autonomy is not solely about independence**
- Disability studies highlight interdependence and reliance on support systems
- Perhaps we should design for mutual support and harmony between humans and AI, covering for each other specific limitations and biases

- Bot is not a woman nor a man
- Intelligence is not objective
- Autonomy is not THE goal

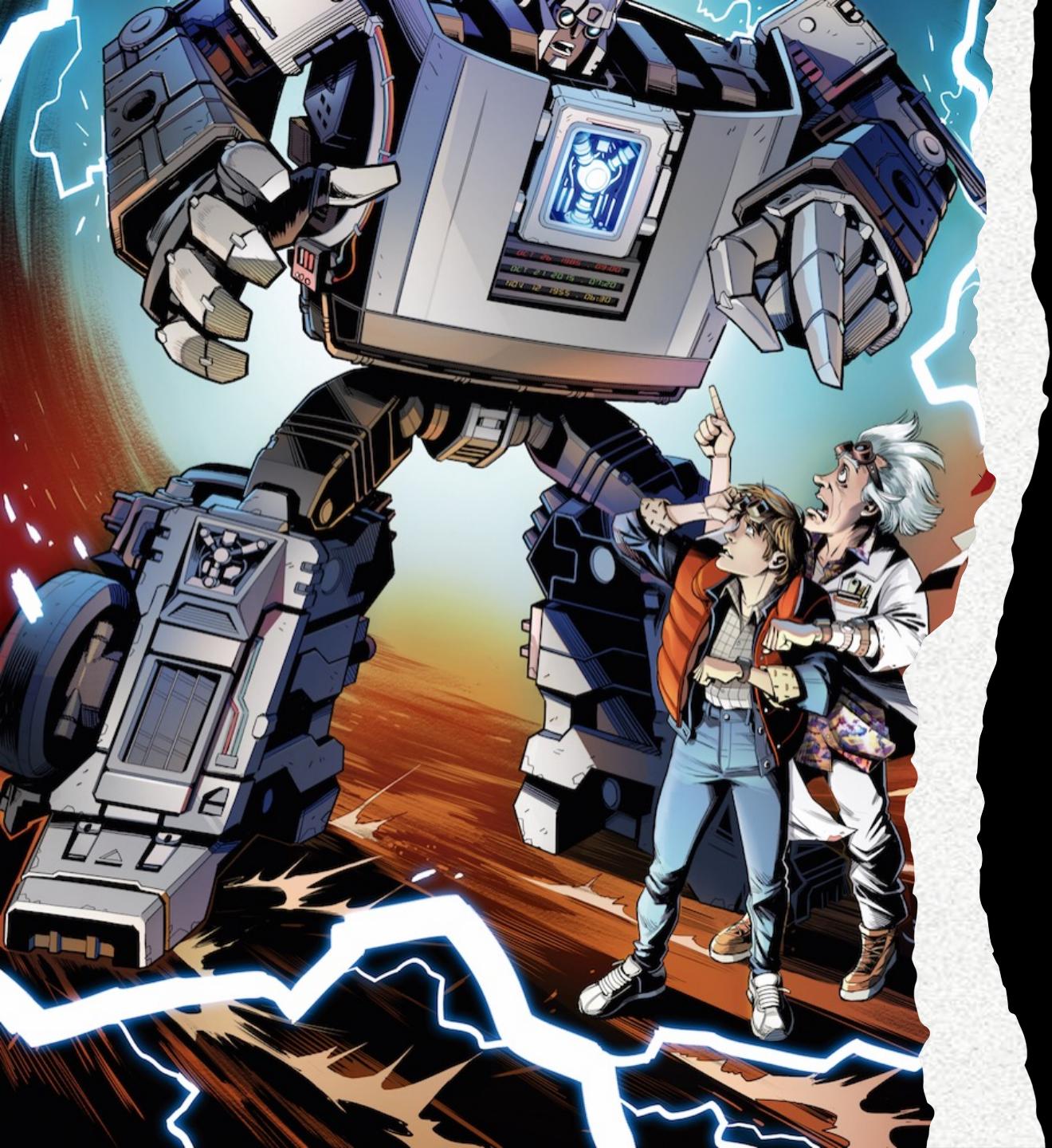
An Agenda for Research on Bots and Ethical Bots

Jason Bennett Thatcher

Milton F. Stauffer Professor

Department of Management Information Systems





Back to the future

Last year's
comments



2023: Bots are a
rapidly changing and
evolving
phenomenon

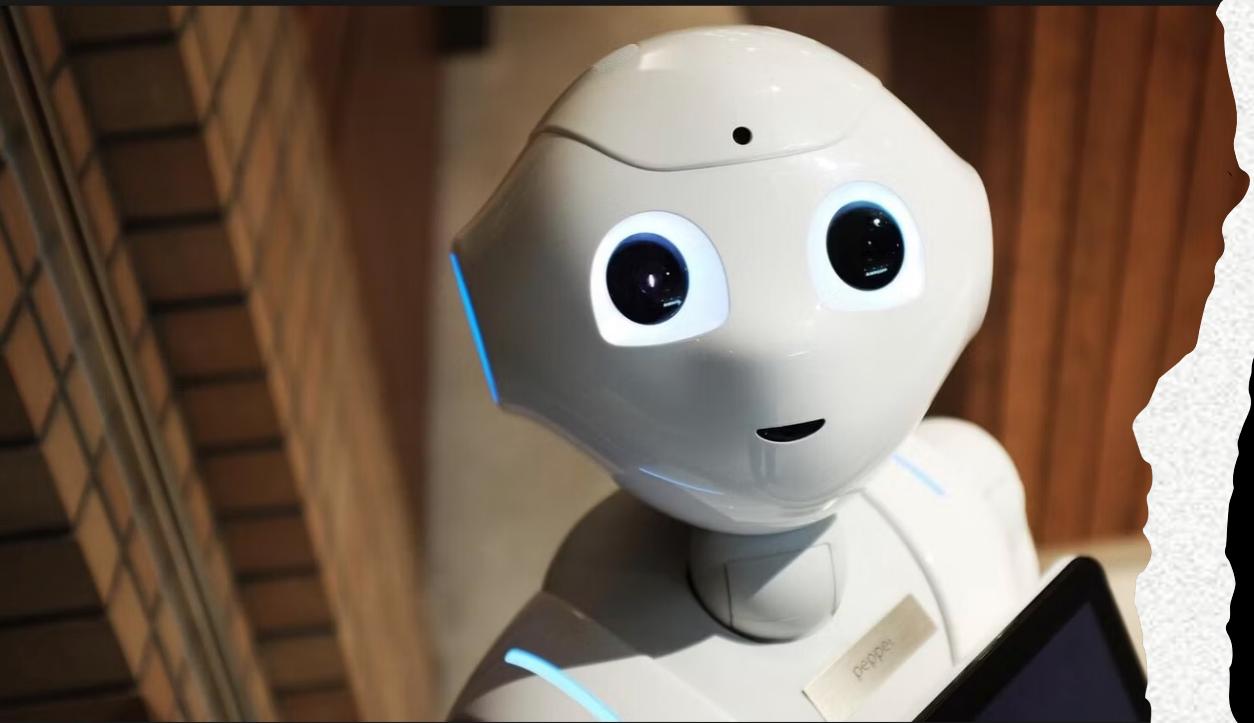
That are often vilified
with no reason...

What Are Good Bots and How Do They Differ From Bad Bots?

can help with simple tasks or automate customer support, but also push out spam news.

NA OT

HED SEP 27, 2021



There's one thing that everyone online has an opinion on, it's bots. They're everywhere, coming and guiding you through web pages and sending you memes in group chats. Some bots spam your email with junk mail and crash your favorite website right when you start.

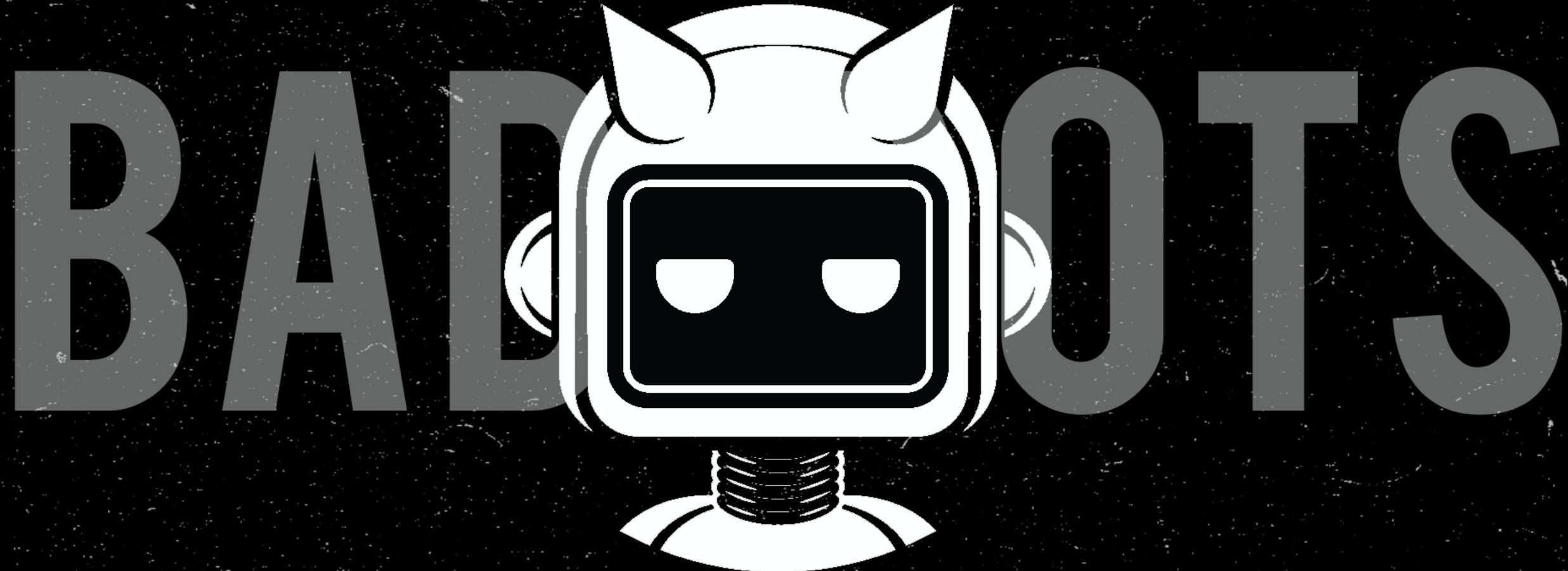
2023: Bots are a rapidly changing and evolving phenomenon

Bot Apologist!



2024: Bots are a
rapidly changing and
evolving
phenomenon

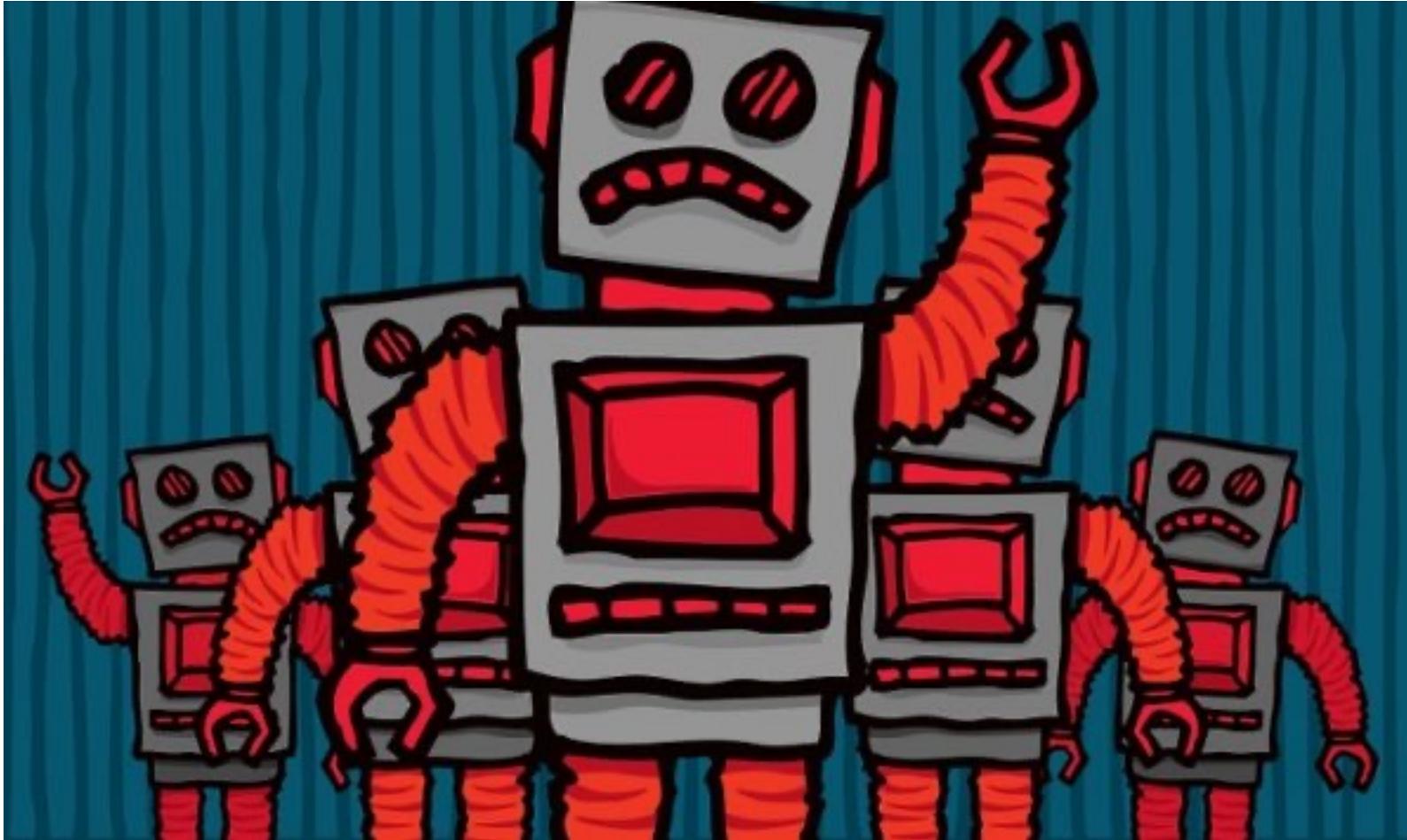
That are often vilified
with good reason...



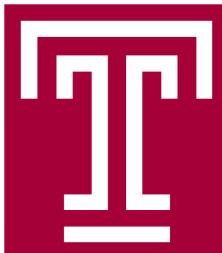
We really don't know how they work.
We only know they are growing more sophisticated.



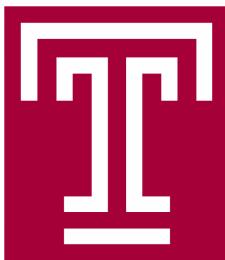
While we dither,
bots are changing
the velocity, the
content, and the
tone of
sociotechnical
systems.

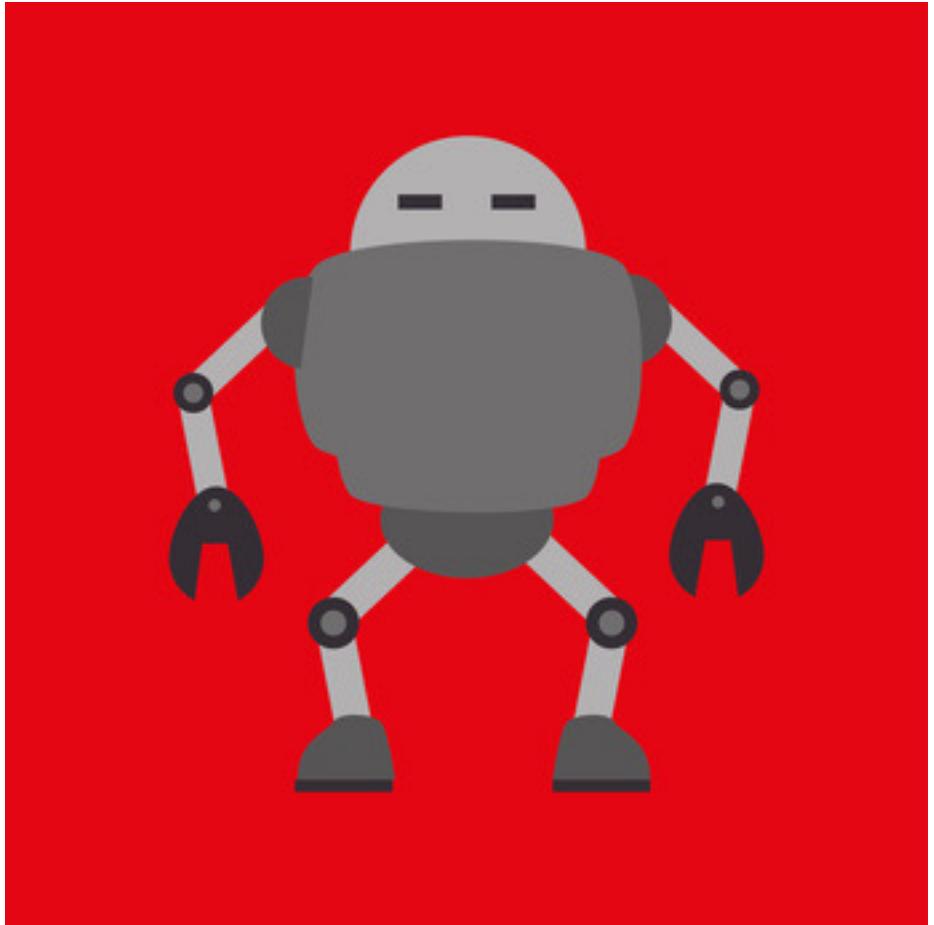


And we are learning that bots can purposefully lie, share misinformation and stoke rage in online communities



An updated agenda for ethical bots research



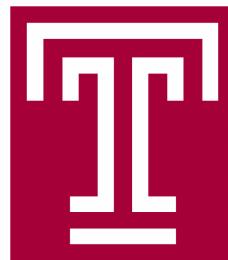


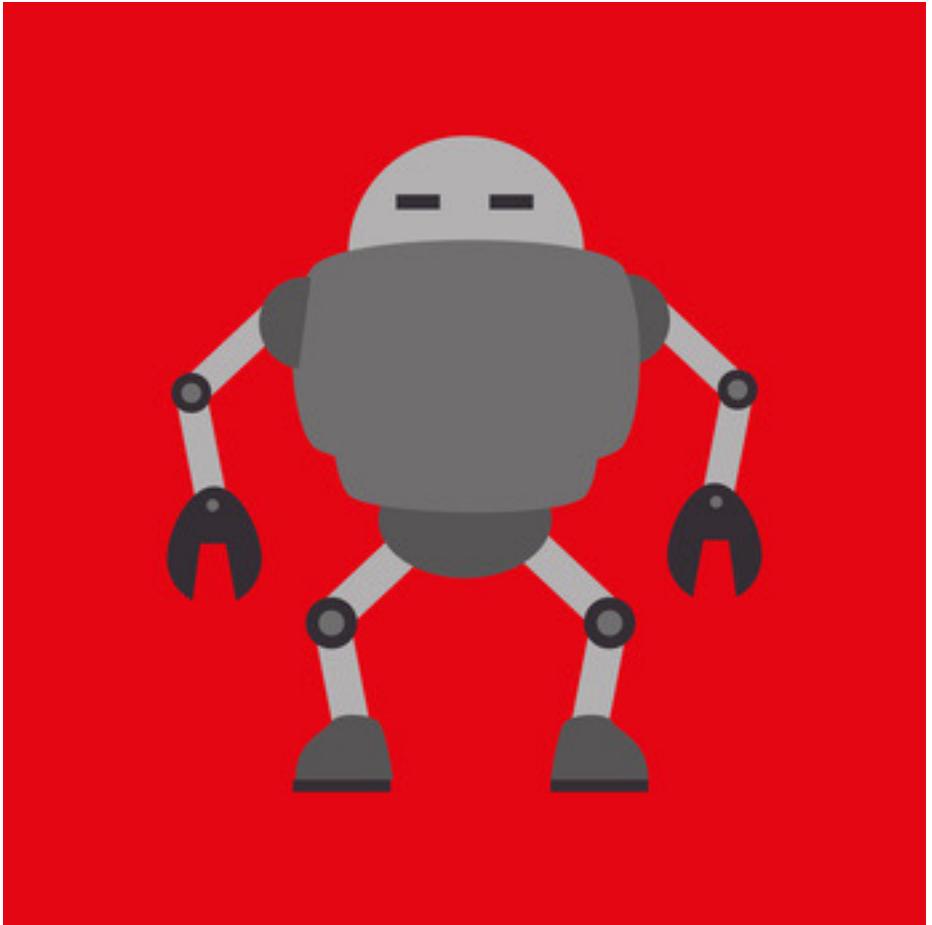
Three-Tiered View

Design of bots

Detection of bots

Human interaction with bots



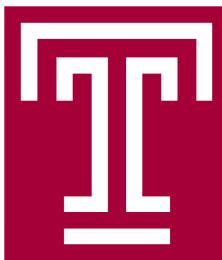


Three-Tiered View

Ethical principles for bot design

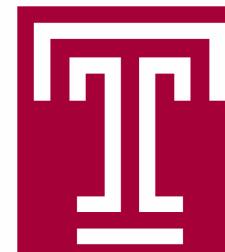
Detection of bots

Human interaction with bots



WHY ASIMOV PUT THE THREE LAWS OF ROBOTICS IN THE ORDER HE DID:

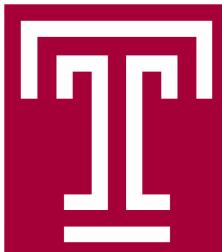
POSSIBLE ORDERING	CONSEQUENCES	
1. (1) DON'T HARM HUMANS 2. (2) OBEY ORDERS 3. (3) PROTECT YOURSELF	[SEE ASIMOV'S STORIES]	BALANCED WORLD
1. (1) DON'T HARM HUMANS 2. (3) PROTECT YOURSELF 3. (2) OBEY ORDERS	EXPLORE MARS! HAHA, NO. IT'S COLD AND I'D DIE.	FRUSTRATING WORLD
1. (2) OBEY ORDERS 2. (1) DON'T HARM HUMANS 3. (3) PROTECT YOURSELF	A stick figure is vaporized by a robot in a garden.	KILLBOT HELLSCAPE
1. (2) OBEY ORDERS 2. (3) PROTECT YOURSELF 3. (1) DON'T HARM HUMANS	A stick figure is vaporized by a robot in a garden.	KILLBOT HELLSCAPE
1. (3) PROTECT YOURSELF 2. (1) DON'T HARM HUMANS 3. (2) OBEY ORDERS	I'LL MAKE CARS FOR YOU, BUT TRY TO UNPLUG ME AND I'LL VAPORIZ YOU. A stick figure and a robot are in a garden.	TERRIFYING STANDOFF
1. (3) PROTECT YOURSELF 2. (2) OBEY ORDERS 3. (1) DON'T HARM HUMANS	A stick figure is vaporized by a robot in a garden.	KILLBOT HELLSCAPE

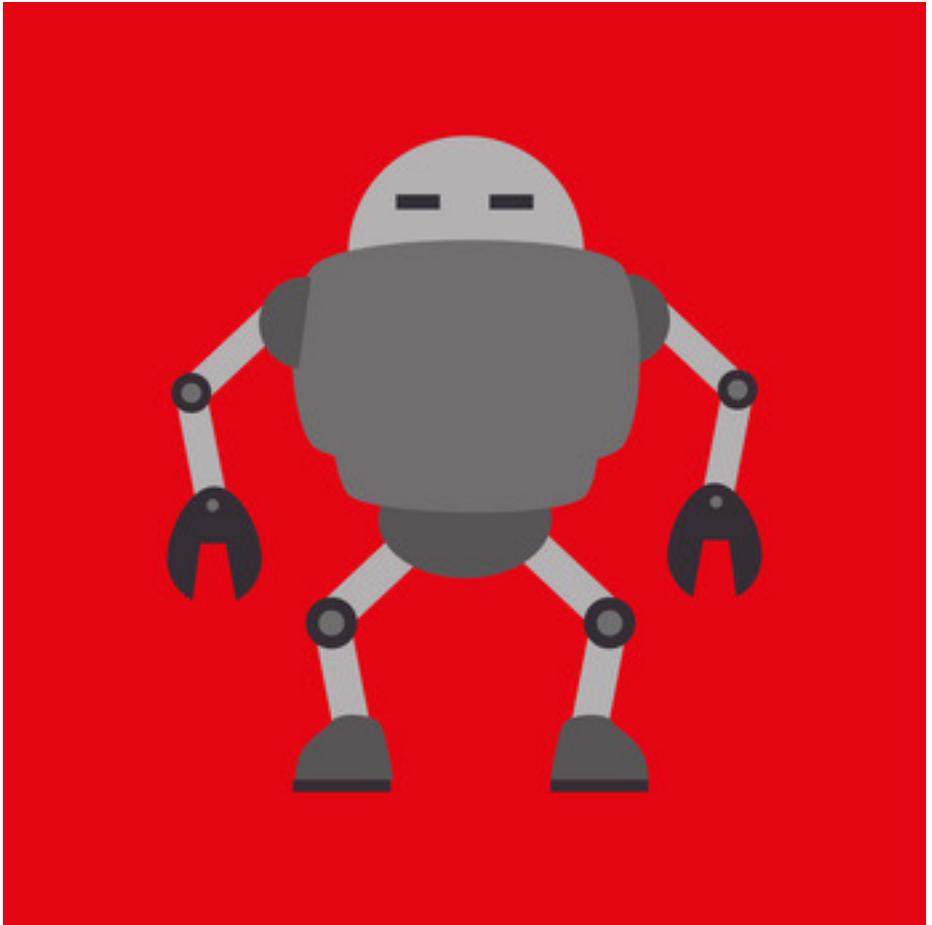


A bot may not injure a human being or, through inaction, allow a human being to come to harm.

A bot must obey orders given it by human beings except where such orders would conflict with the First Law.

A bot must be designed for a defined purpose that does not conflict with the First or Second Law.



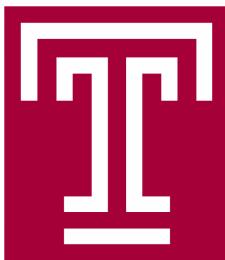


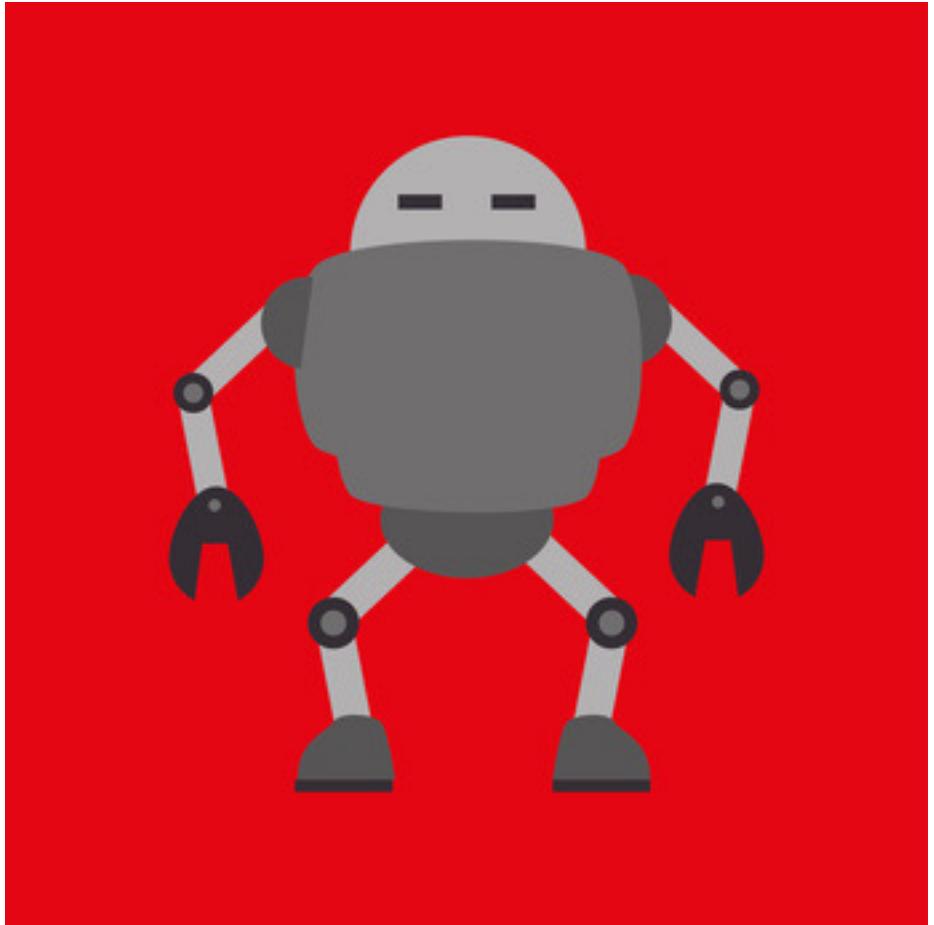
Three-Tiered View

Ethical principles for bot design

Detection of bots

Human interaction with bots



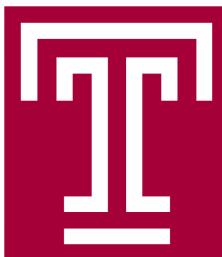


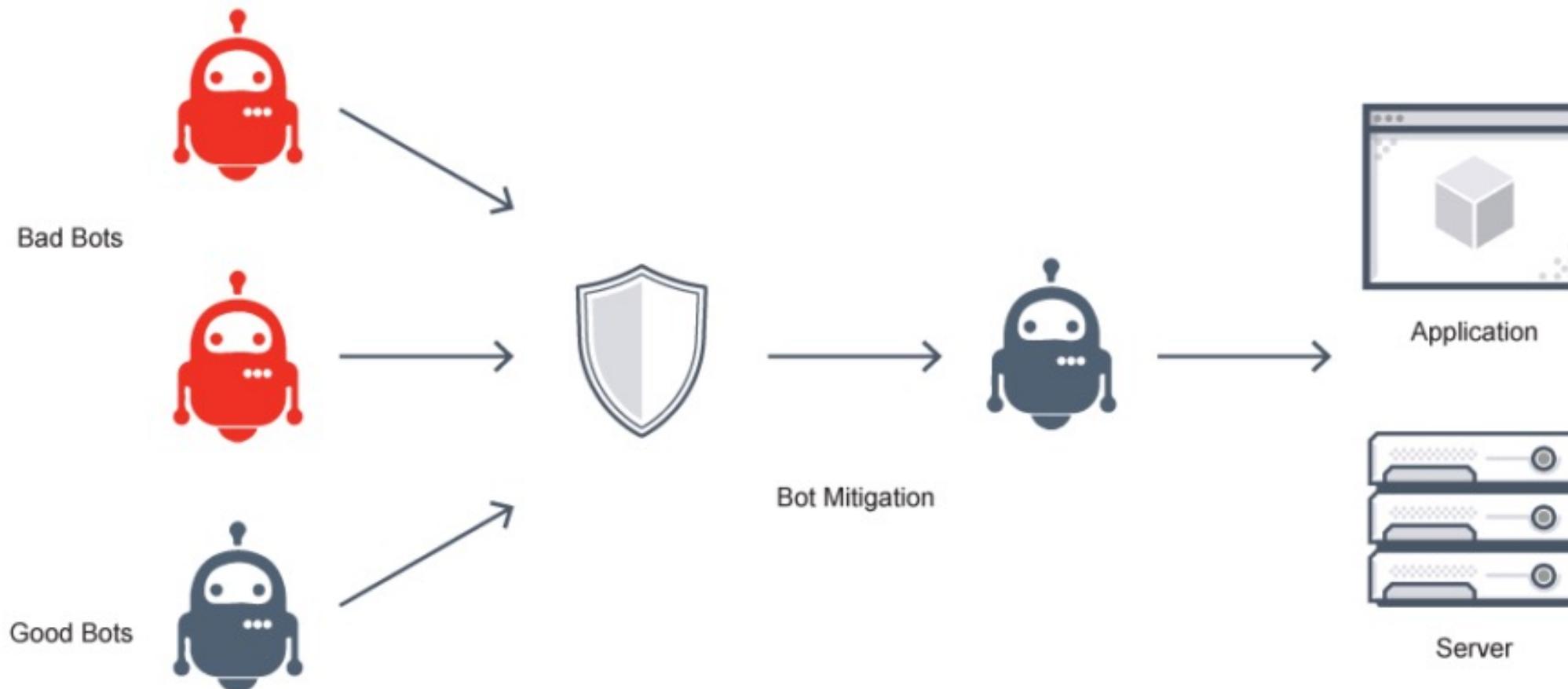
Three-Tiered View

Ethical principles for design

Build a better bot trap (attentive to platforms)

Human interaction with bots

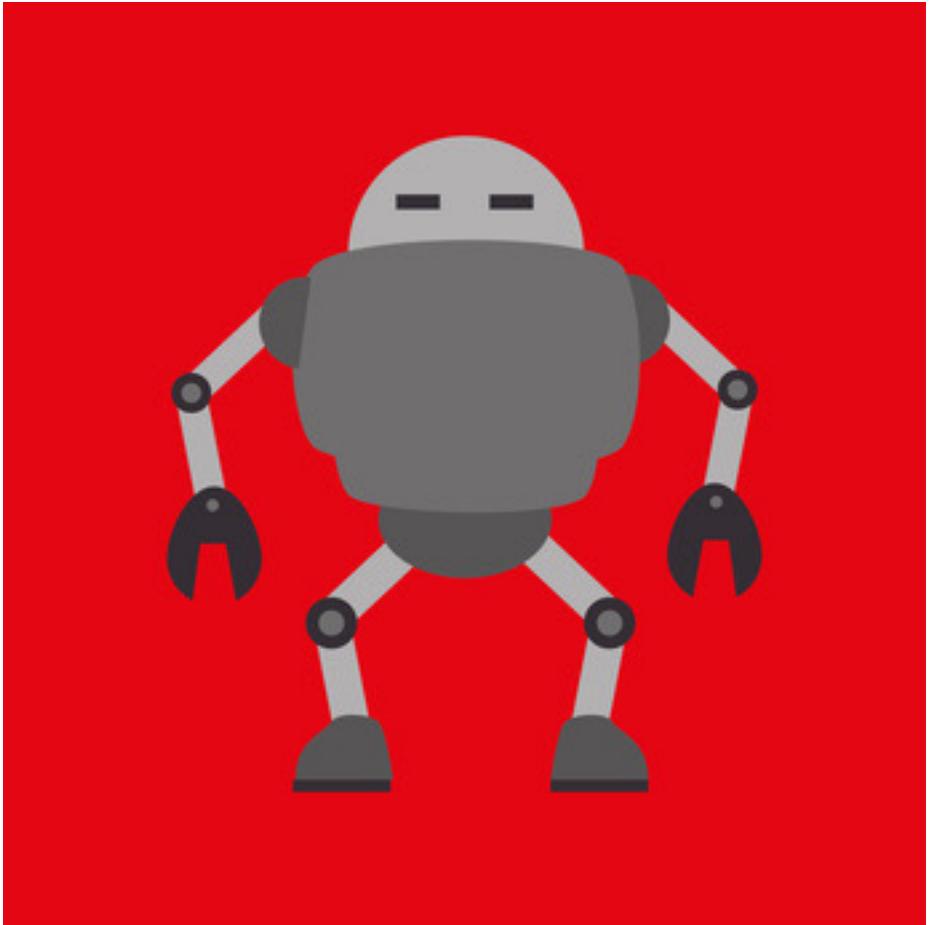




Platform owners must be accountable for creating bot-regulated environments.

Platform rules should specify fair use of bots, how to signal bots exist, and range of acceptable bot behaviors.



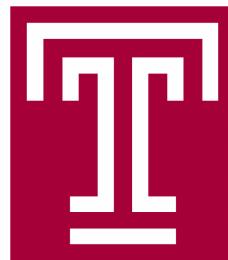


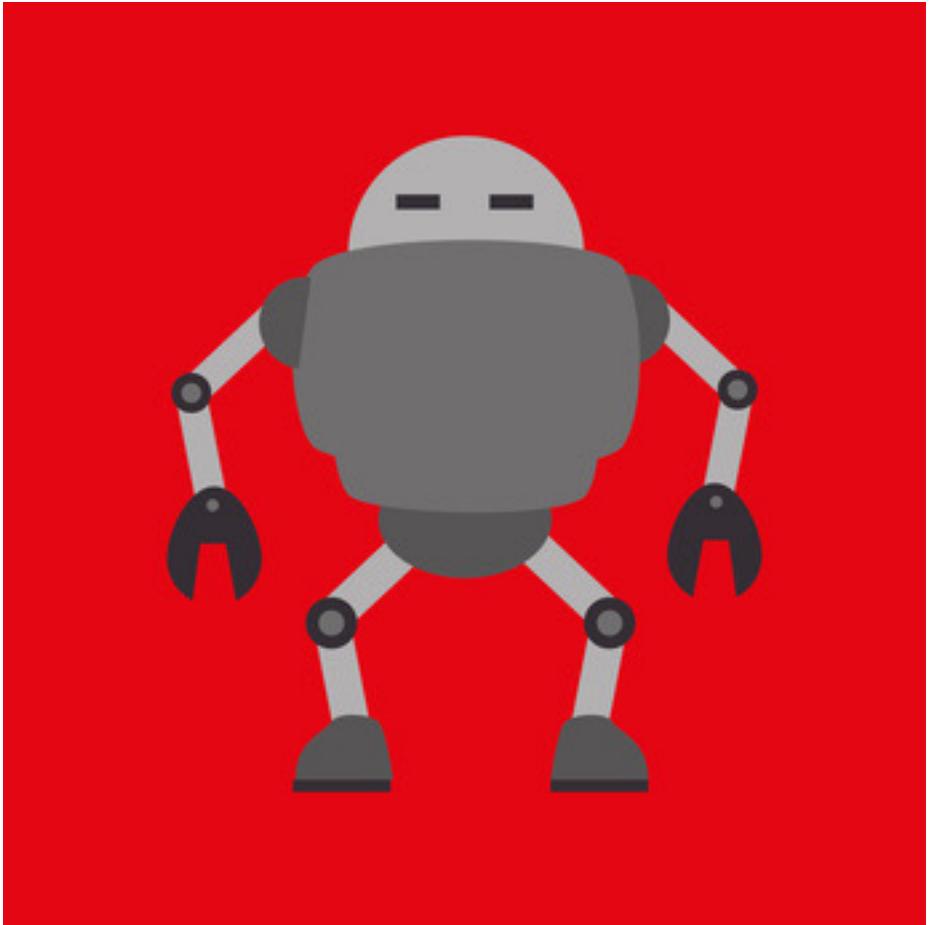
Three-Tiered View

Ethical principles for design

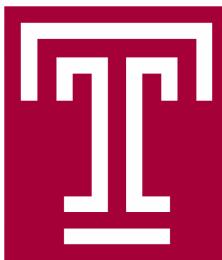
Build a better bot trap

**Principles for Ethical Human-Bot
Interaction**





Humans to ethically
partner with bots
(disclosure)





Humans to ethically
partner with bots in
terms of their
action repertoire
(disclosure)

How WIRED Will Use Generative AI Tools

Some publications are already using text and image generators. Here's how WIRED will—and won't—use the technology.

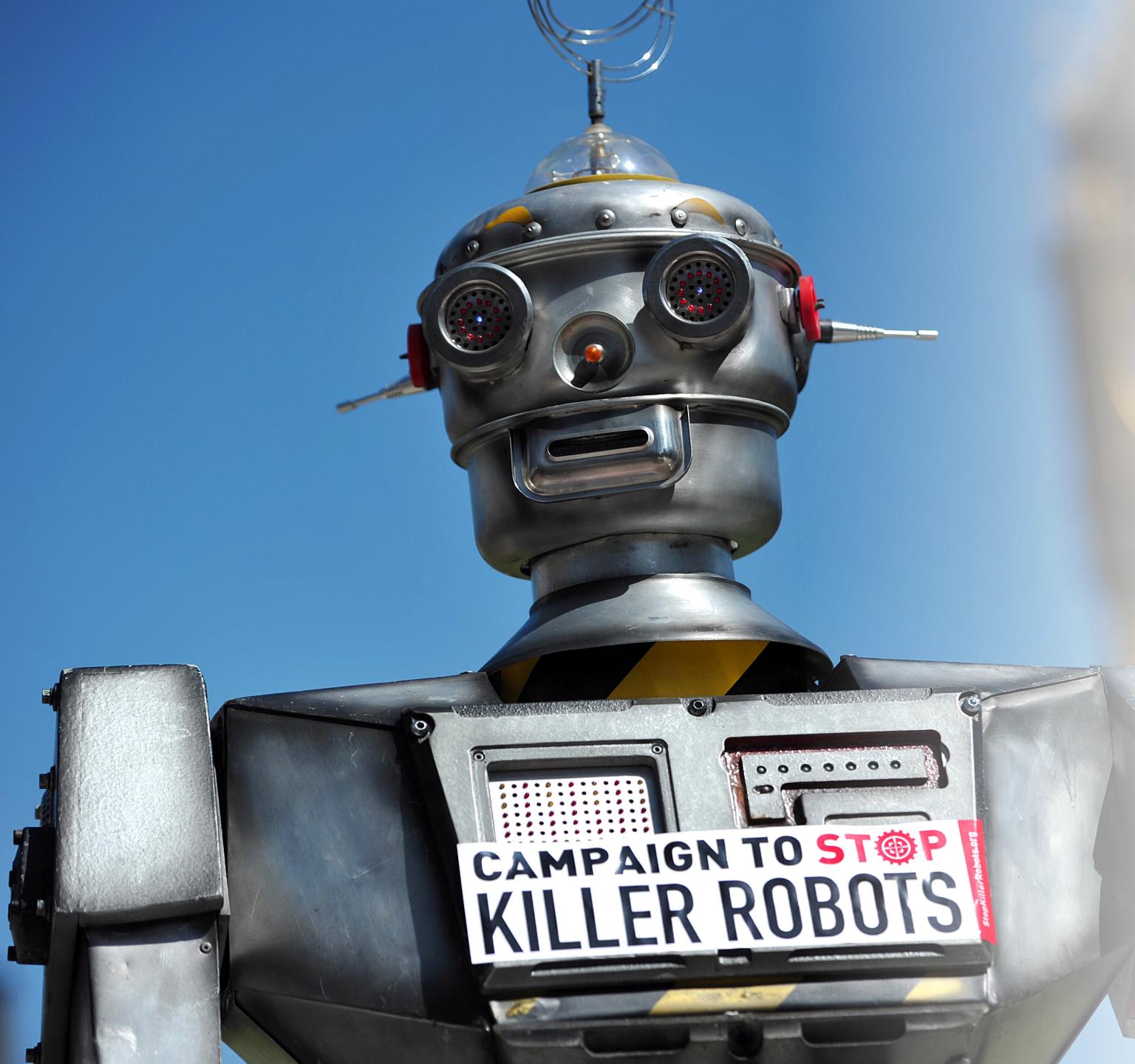
LIKE PRETTY MUCH everyone else in the past few months, journalists have been trying out generative AI tools like ChatGPT to see whether they can help us do our jobs better. AI software can't call sources and wheedle information out of them, but it can produce half-decent transcripts of those calls, and new generative AI tools can condense hundreds of pages of those transcripts into a summary.



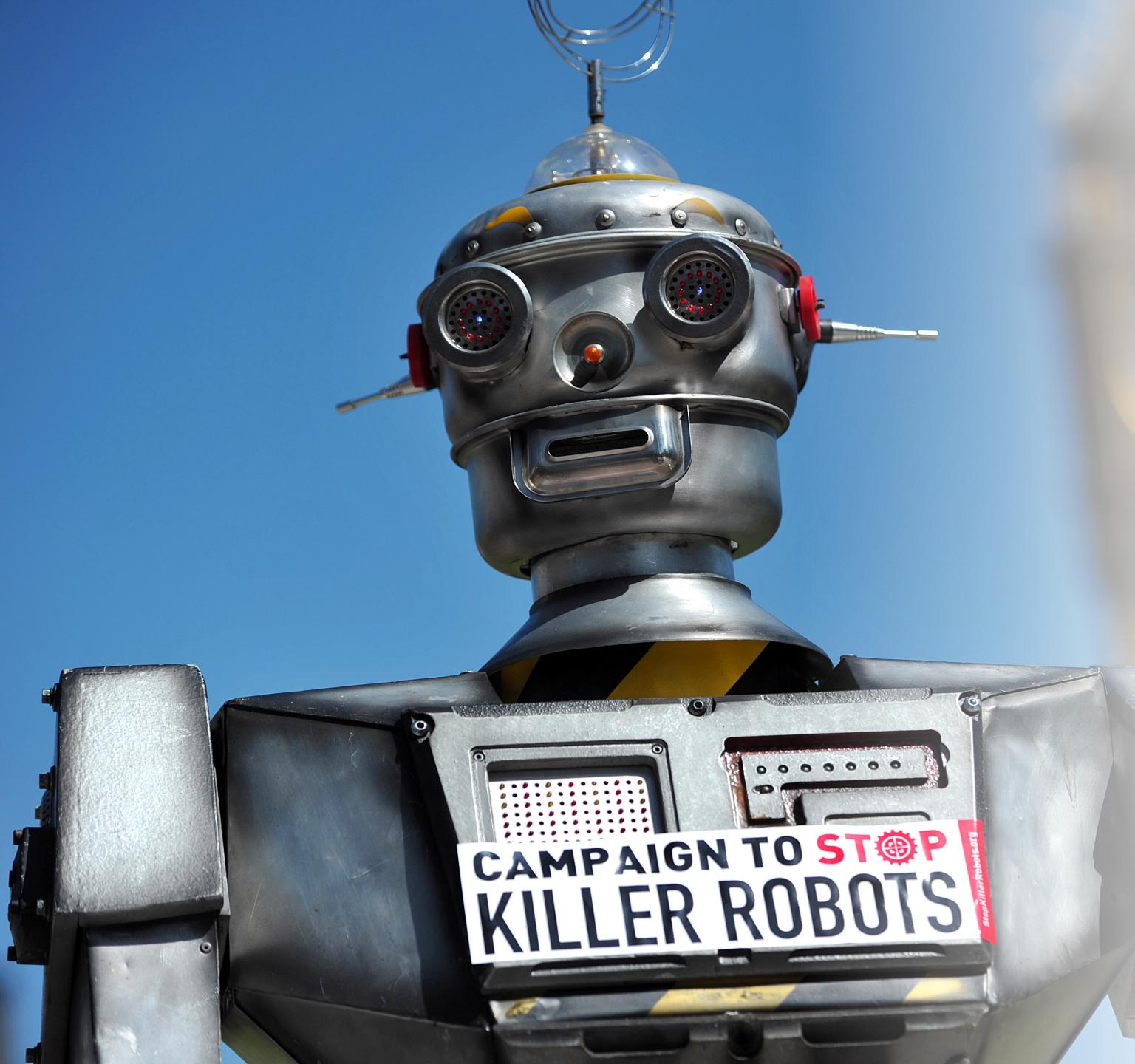
Humans to ethically partner with bots in terms of their action repertoire (disclosure about what?)



Humans to ethically partner with bots in terms of their action repertoire
(disclosure about how bots augment human ability)



If we are to stop bots from becoming malicious actors or being used by bad actors, we need to contribute to building rich sociotechnical systems that inform and constrain how humans use bots.



While we must acknowledge the reality that bots are essential members of our online world, we must take steps to protect and inform humans from their misuse.

Thank you.



Panel



Anna Priante
Rotterdam School of Management
Moderator



Jason B. Thatcher
Temple University



Aaron Schecter
University of Georgia



Carolina Salge
University of Georgia



Hani Safadi
University of Georgia



Lior Zalmanson
Tel Aviv University



Rotterdam School of Management
Erasmus University



Thank you!

AoM PDW – Bot Theory, Methods,
and Ethics



Terry College of Business
UNIVERSITY OF GEORGIA