RSM Erasmus | Rotterdam School of Management
Erasmus University

AoM PDW – Bot Theory, Methods, and Ethics

Carolina A. de Lima Salge

Anna Priante

Aaron Schecter

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

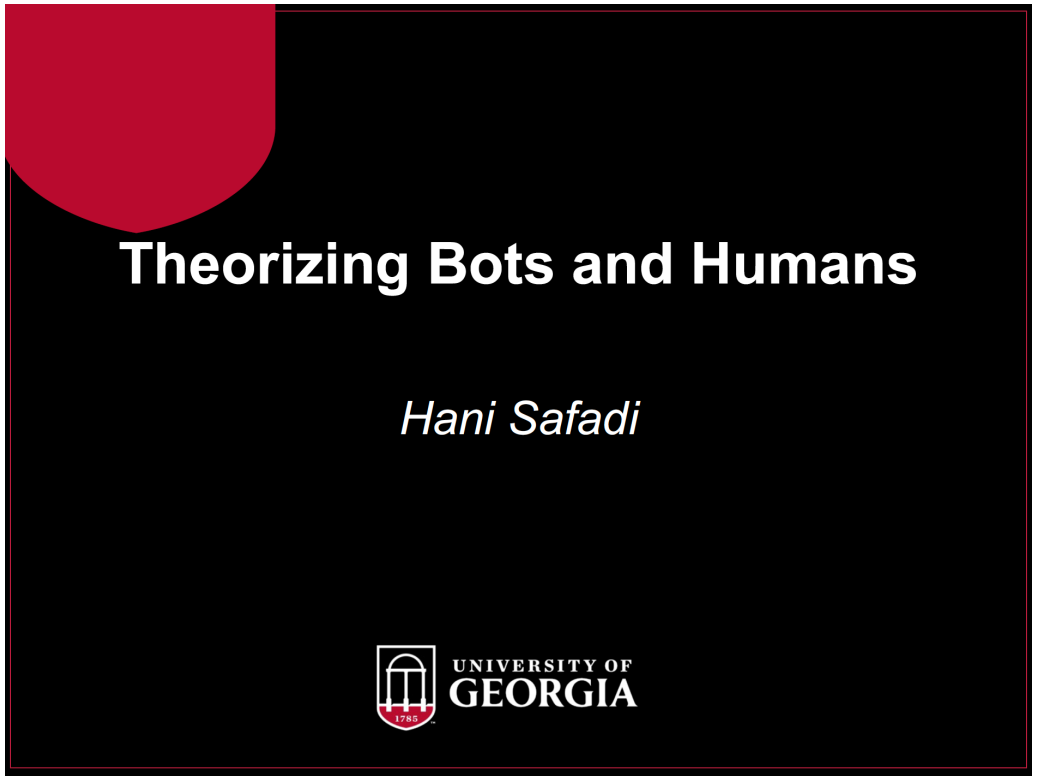
RSM Erasmus | Rotterdam School of Management
Erasmus University

Terry College of Business
UNIVERSITY OF GEORGIA

Presentations

Hani Safadi

University of Georgia



RSM Erasmus | Rotterdam School of Management
Erasmus University

Terry College of Business
UNIVERSITY OF GEORGIA

Presentations

Lior Zalmanson

Tel Aviv University

RSM Erasmus | Rotterdam School of Management Erasmus University

Terry College of Business UNIVERSITY OF GEORGIA

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

RSM Erasmus | 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

RSM Erasmus | Rotterdam School of Management Erasmus University

Terry College of Business
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

How can I be of service?

What are the major uses?

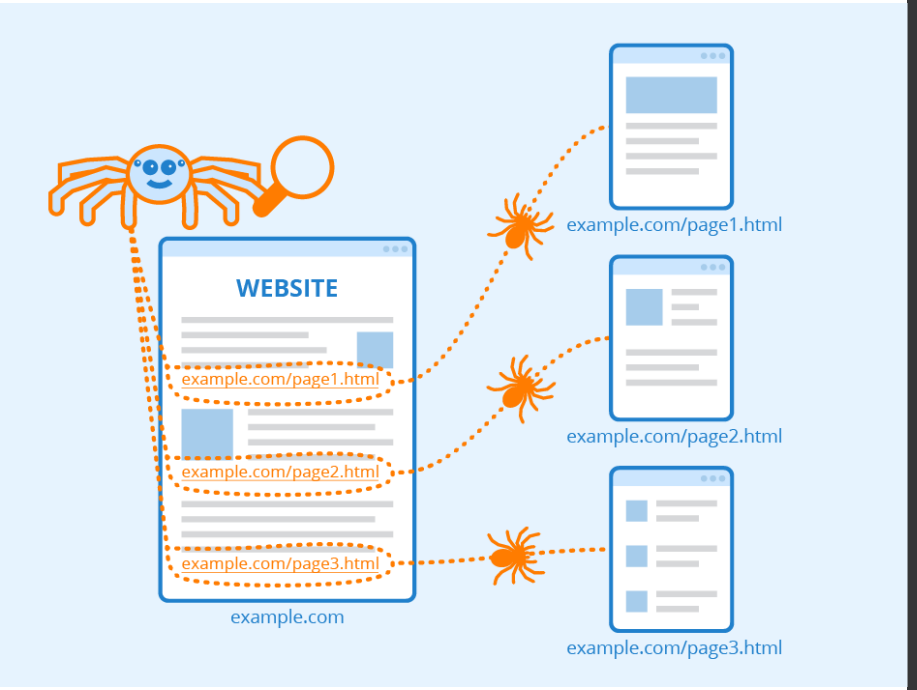
- Webcrawling — **Archival Data Collection**
- Webscraping
- Participant management — **Data Management**
- Chatbots — **Direct Data Collection**
- Experimental manipulation

Theorizing? Analysis?

Not Yet…

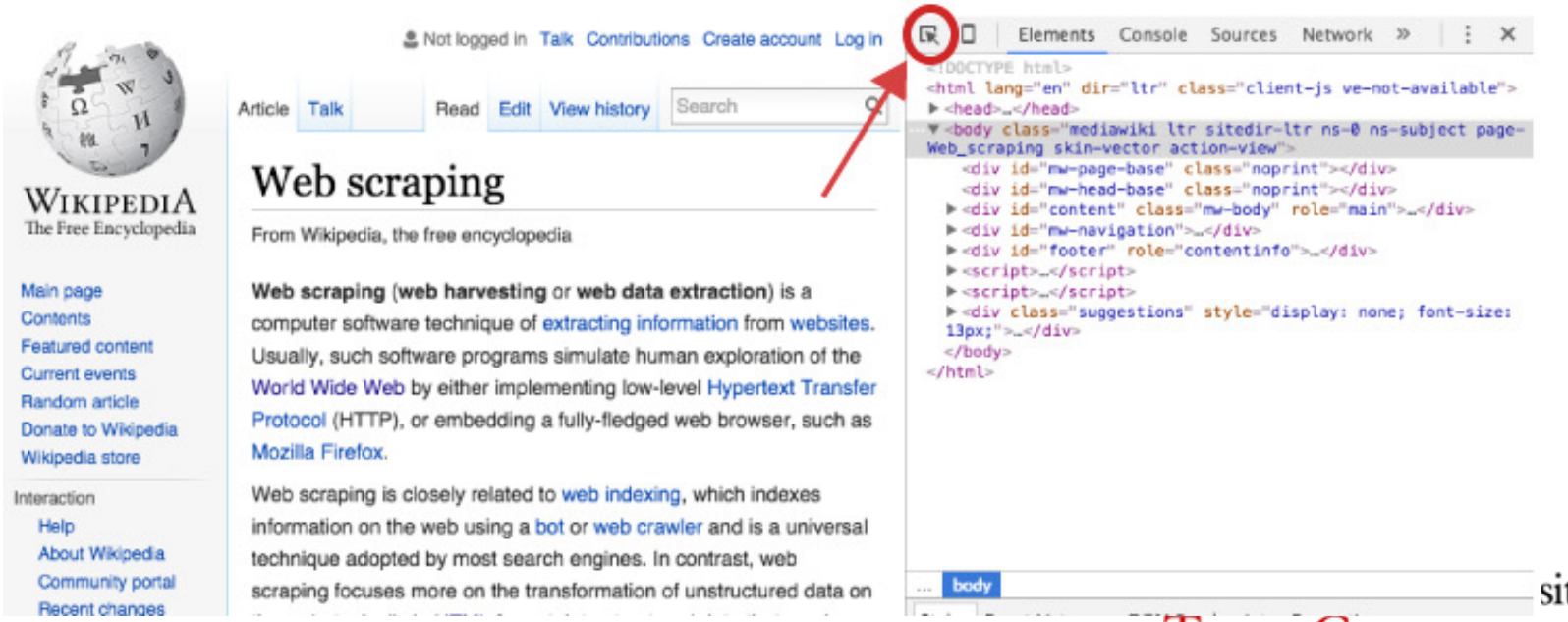
Webcrawlers

- 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



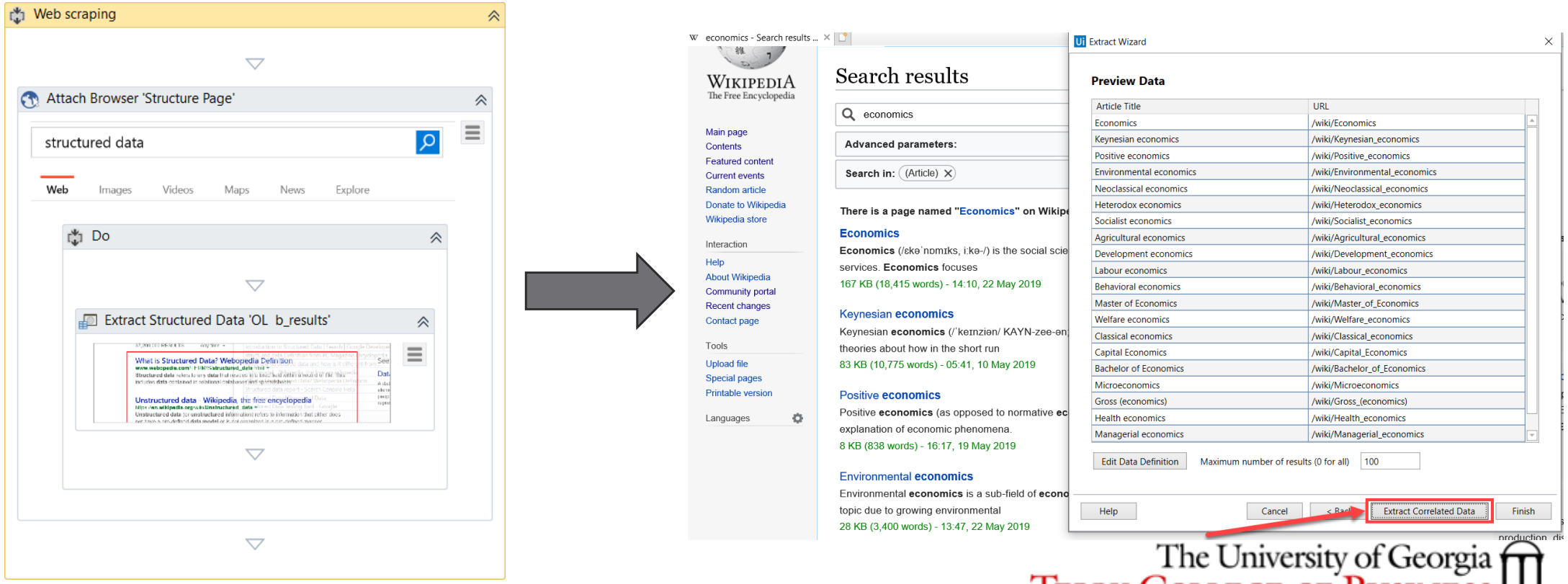
Webscrapers

- 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)



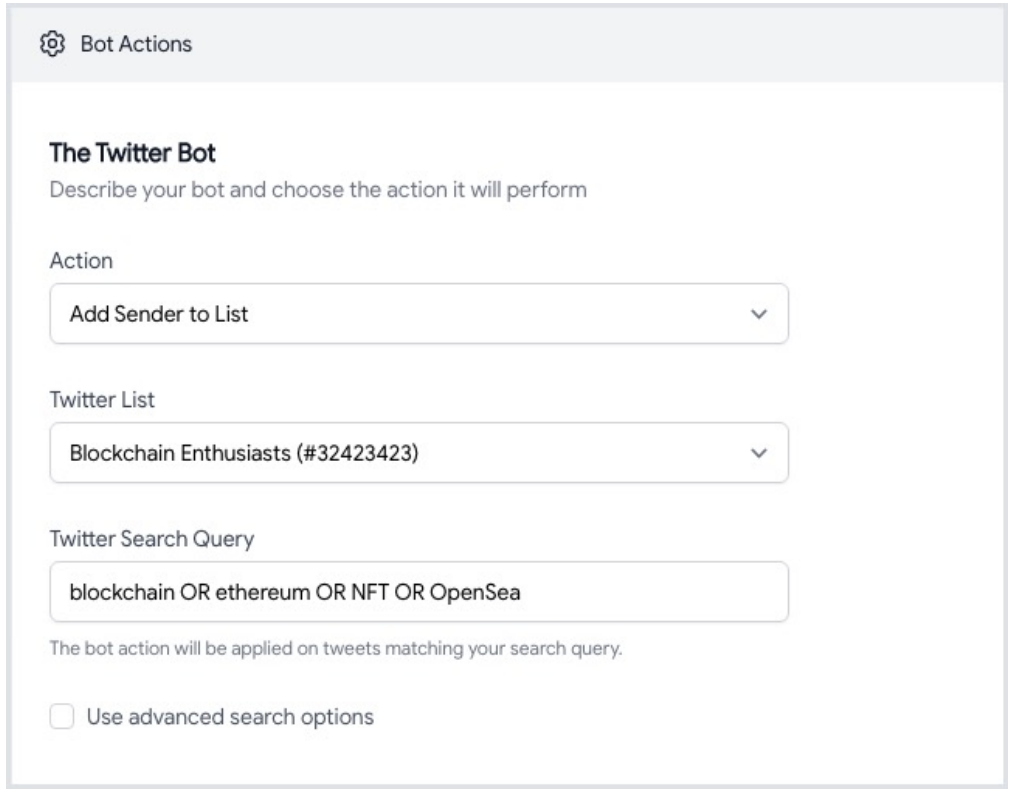
Webscrapers

- 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



The University of Georgia
TERRY COLLEGE OF BUSINESS

Bots for Managing Participants

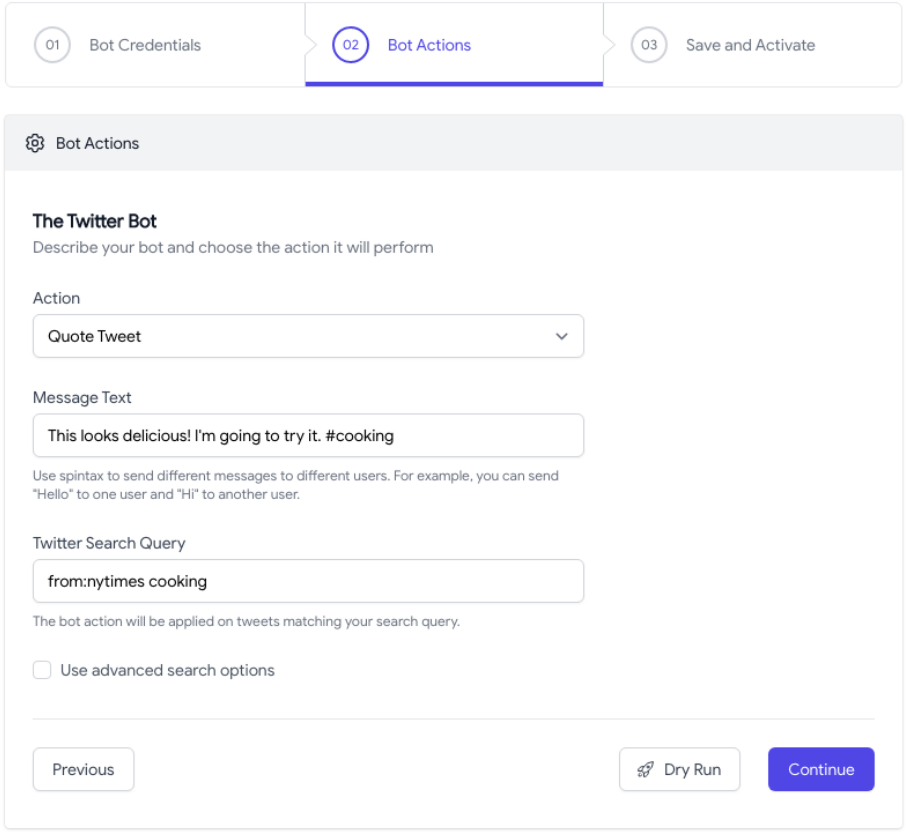


- Bots – particularly on social media – can be used to recruit and/or follow up with participants
  - Can be used in experiments (e.g., to identify accounts and send invitations)
  - Can be used for survey research (e.g., follow up with a participant list)
- The researcher can build a bot that searches 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 are specific times; this could allow researchers to send automated reminders

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

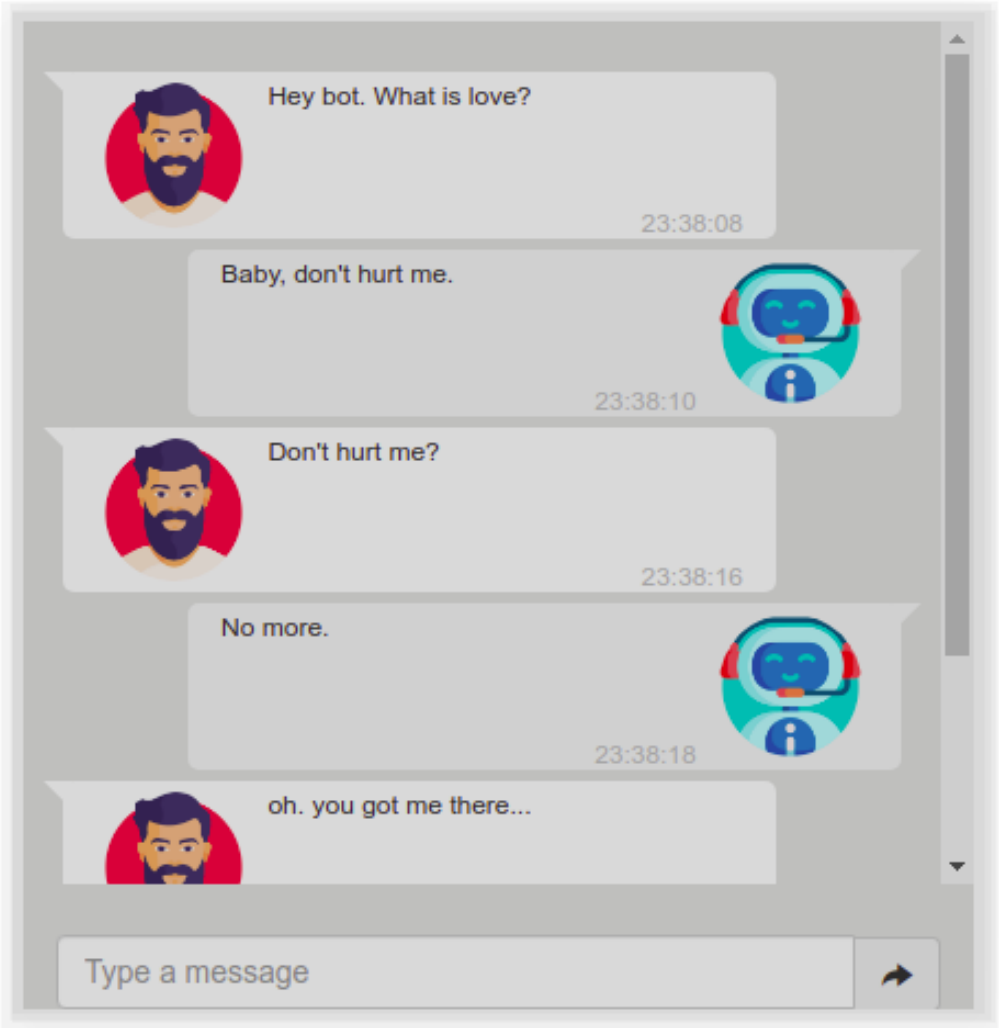
Bots for Experimental Manipulations

- 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



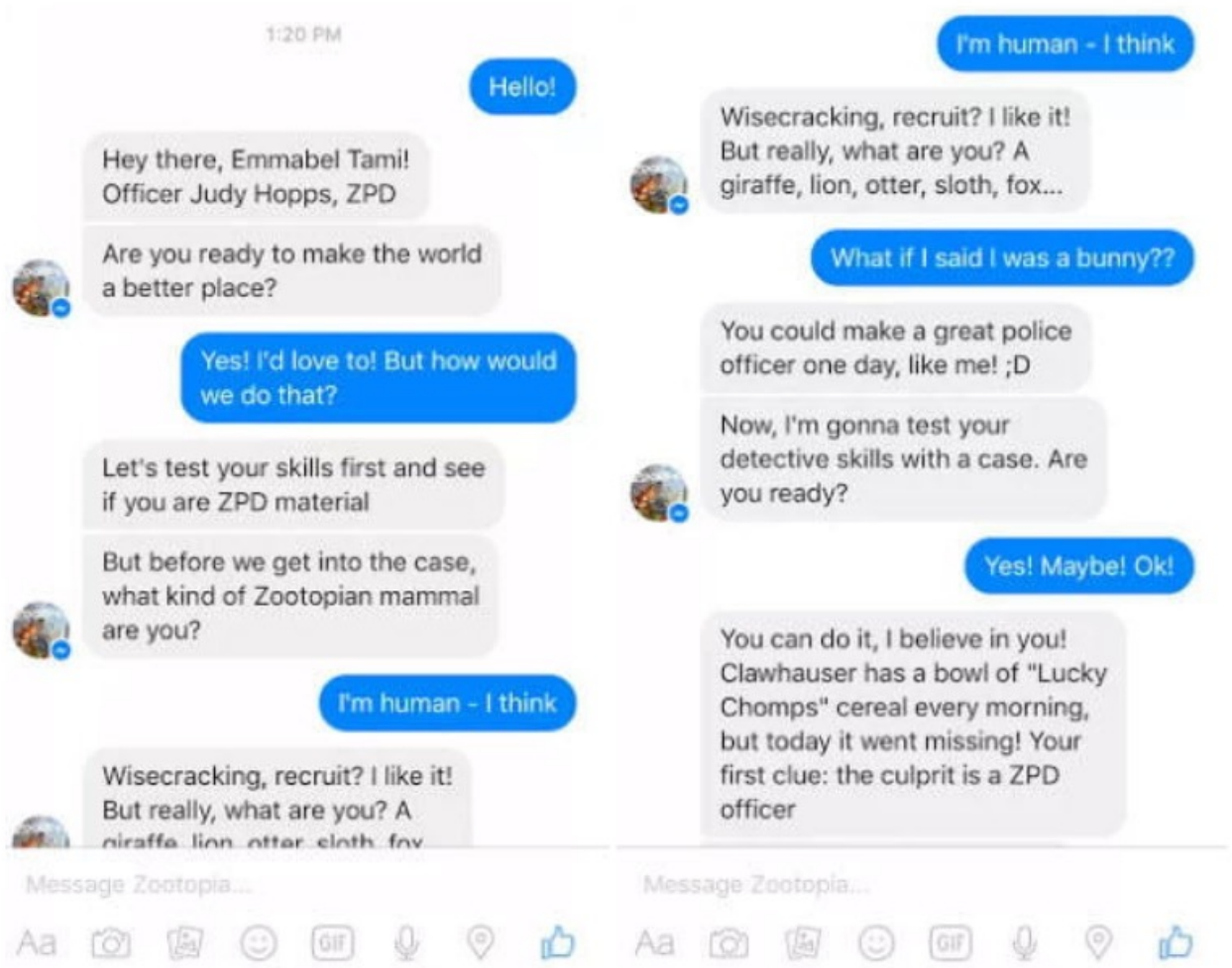
Chatbots

- 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



- 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

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/

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

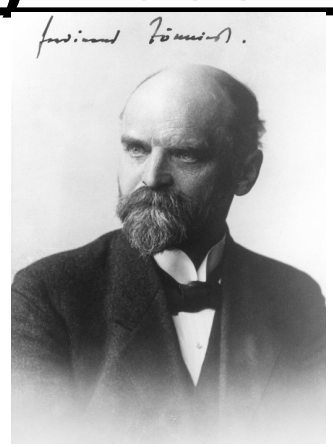
- Bots can be used for research to collect data on the internet at scale
- Bots can be used to recruit, manage, and communicate with study participants
- Bots can deliver experimental treatments to a large population
- Bots can engage in conversation with participants, aiding interviews, disclosures,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

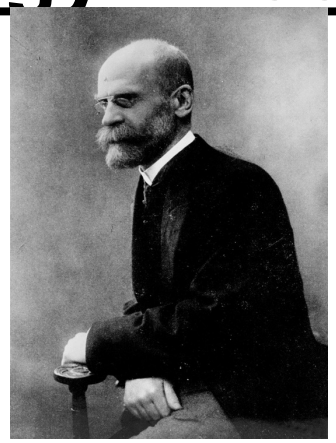
Theorizing Bots and Humans

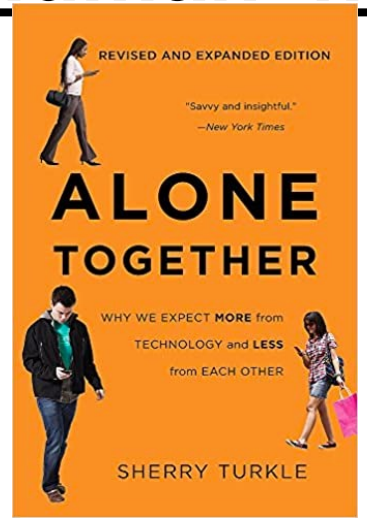
Hani Safadi

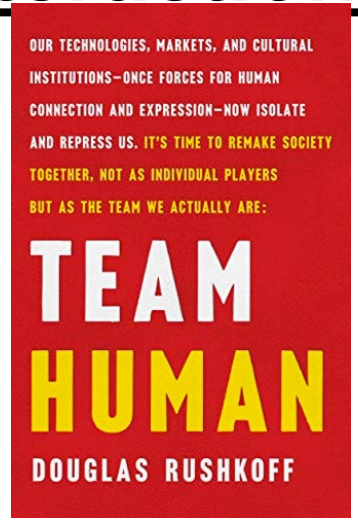
UNIVERSITY OF GEORGIA

(How) Does Technology Affect Human Interaction?

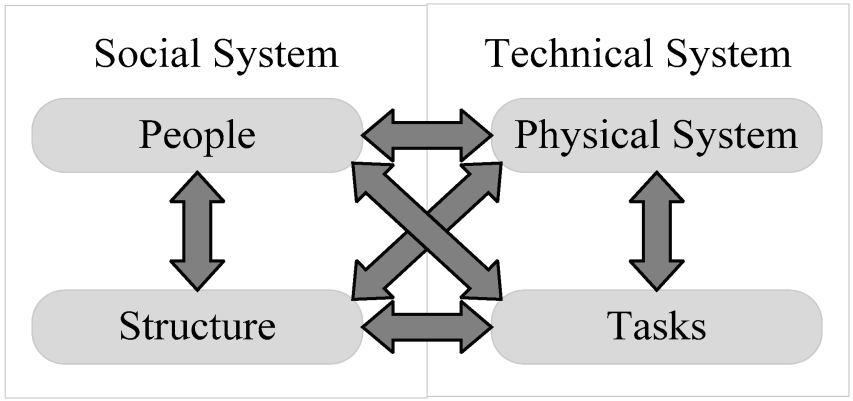




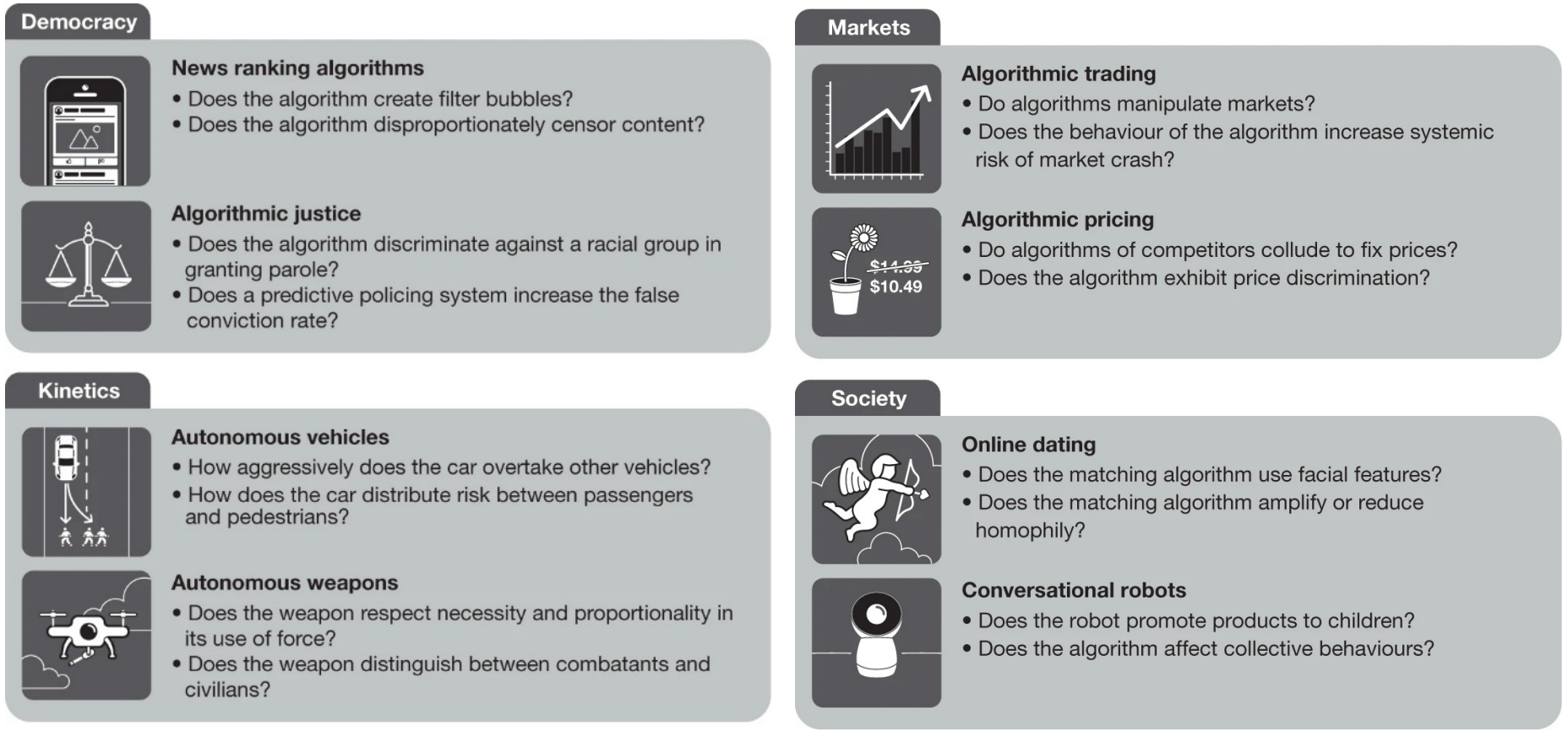




- Gemeinschaft–Gesellschaft dichotomy
- Mechanical solidarity and organic solidarity

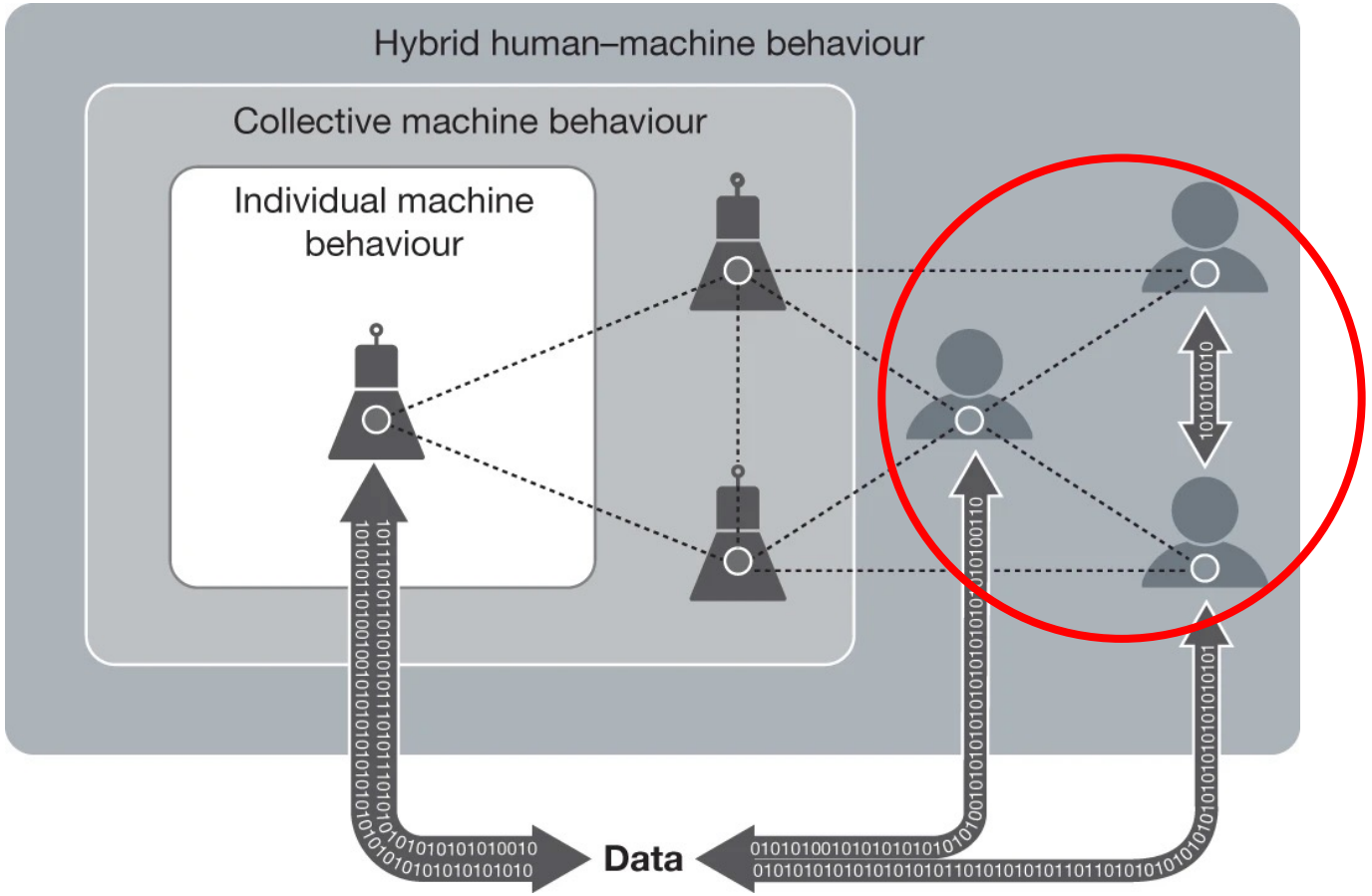


Impact of Algorithms, AI, Robots, …



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

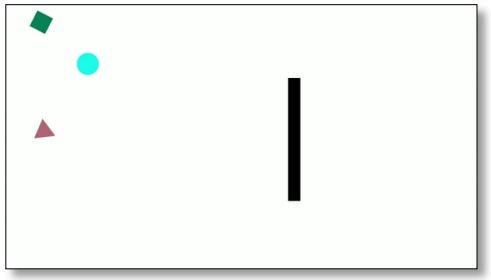
Machines (and Human) Behavior



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

Theory of Mind

https://youtu.be/VTNmLt7QX8E



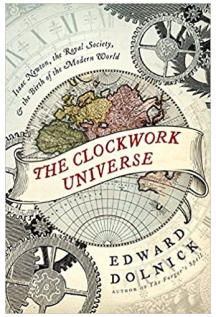
Heider & Simmel (1944)

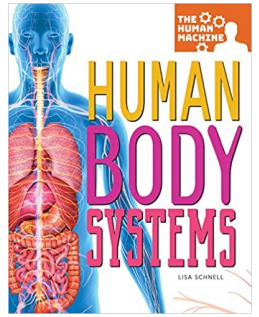
Definition of *anthropomorphism*

: 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*.

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





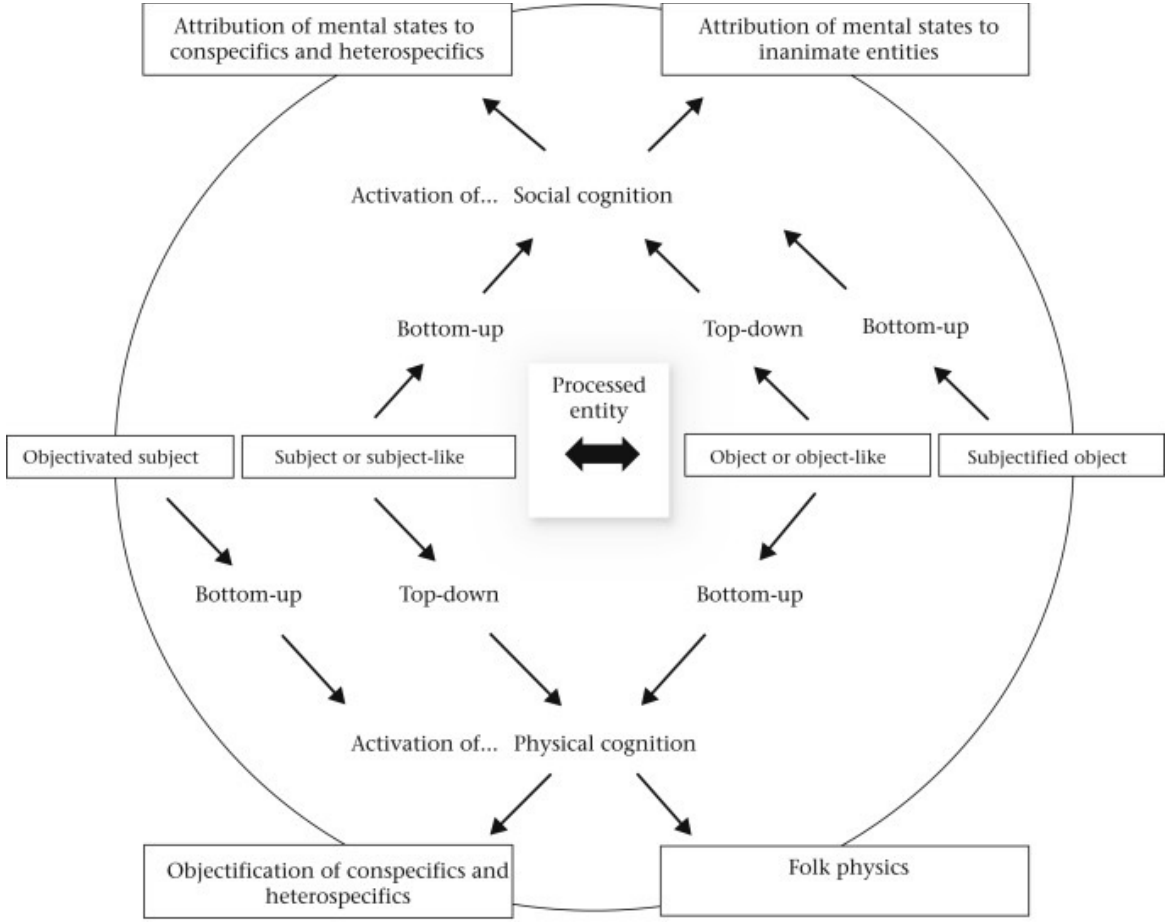
Definition of *mechanomorphism*

: 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)

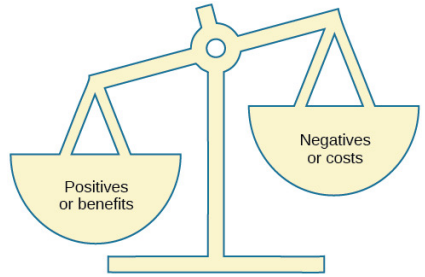
Physical and Social Cognition

- Cognition = f(object, 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)

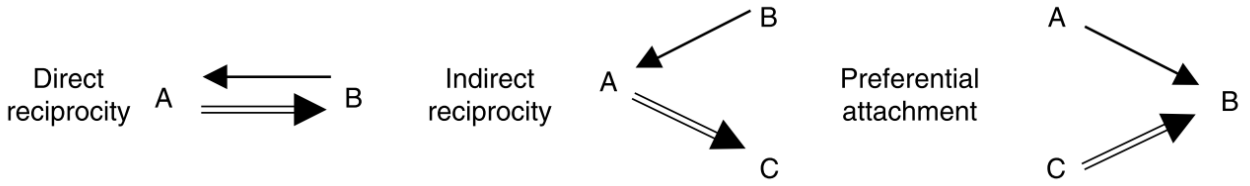


Urquiza-Haas EG, Kotrschal K (2015) The mind behind anthropomorphic thinking: Attribution of mental states to other species. *Anim. Behav.* 109:167–176.

Social Exchange Theory

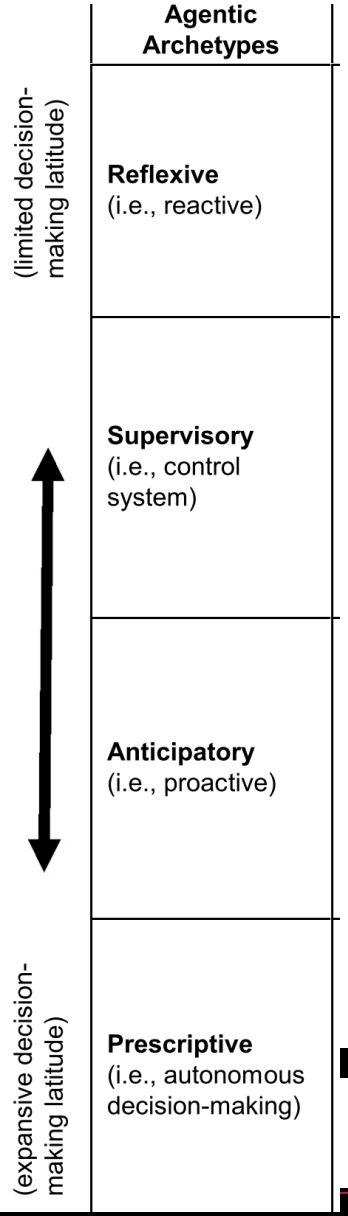


- Social exchange theory examines social relationships through an economic lens (Blau 1964; Homans 1958 ; Emerson 1976)
- How do social norms, negotiated rules, and power dynamics shape emergent elements of exchange? (Blau 1964; Ekeh 1975; Lévi-Strauss 1969)
- Exchange taking place among actors in a 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)

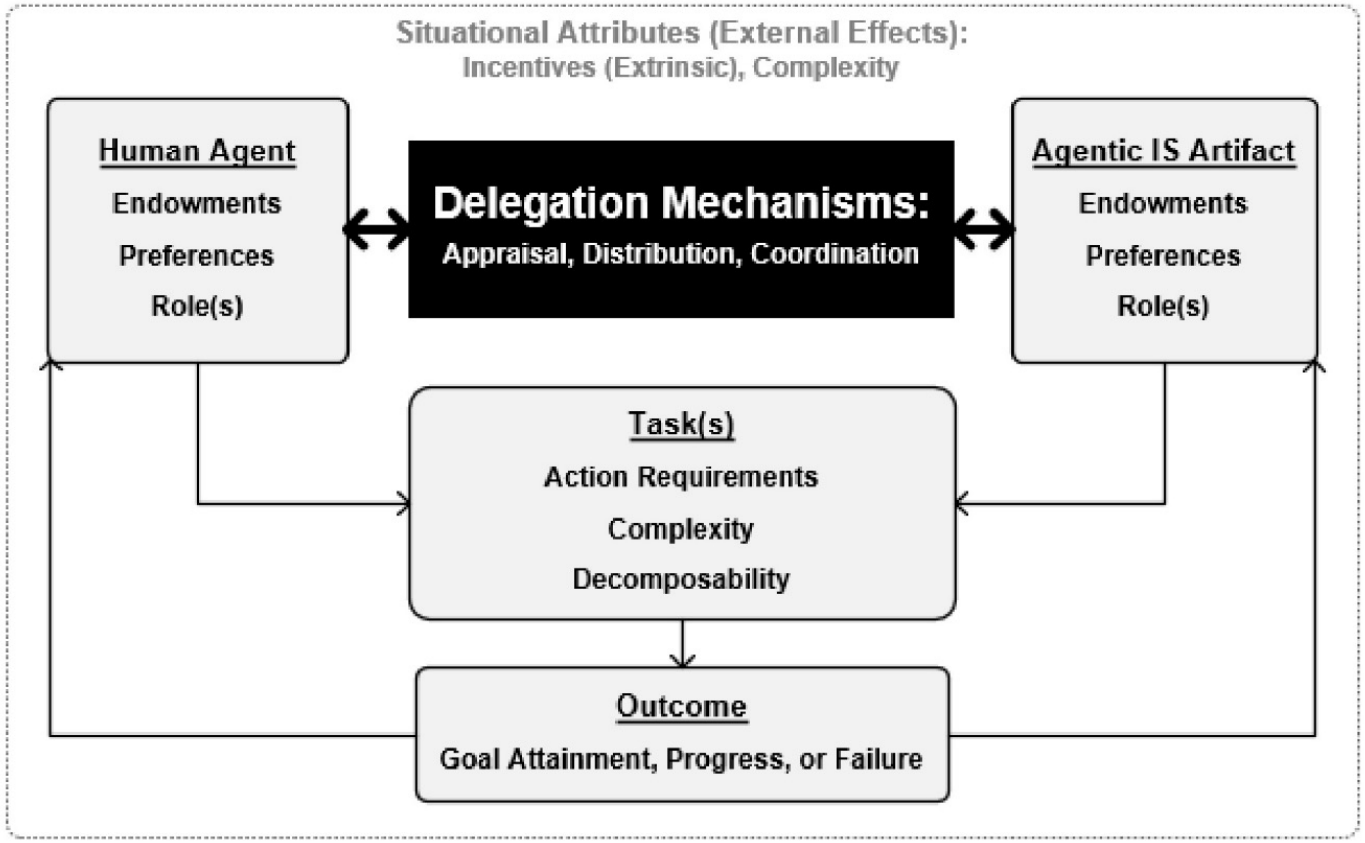


Faraj and Johnson 2011

Agentic Information Systems



agentic artifacts' main properties are situatedness, autonomy, and flexibility (Jennings et al., 1998).

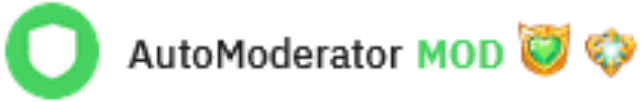


Baird & Maruping (2021) The Next Generation of Research on IS Use: A Theoretical Framework of Delegation to and from Agentic IS Artifacts. *MIS Q.* 45(1):315–341.

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).



- 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

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

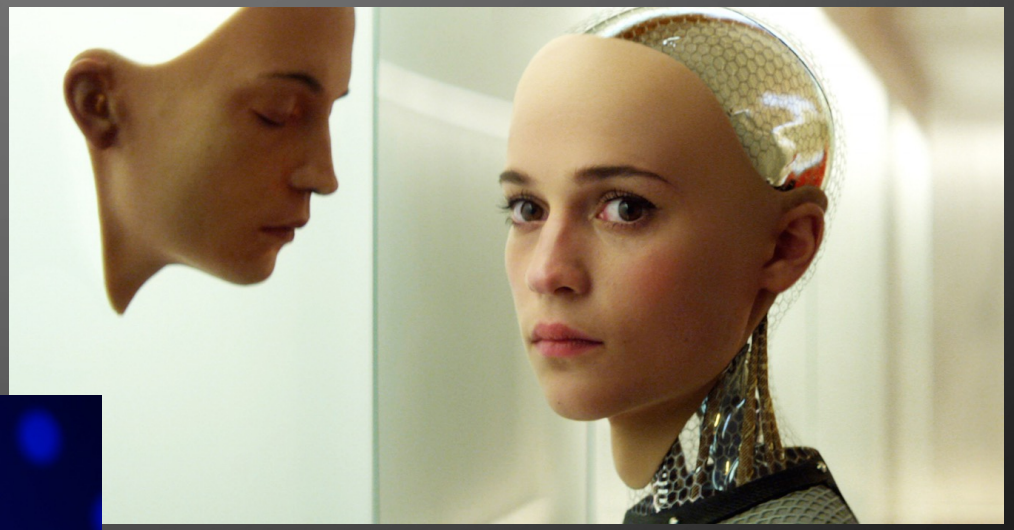
Let's Stop Anthropomorphizing AI And Start Engaging More Broadly

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



THR ORIGIN – ELIZA BOT

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

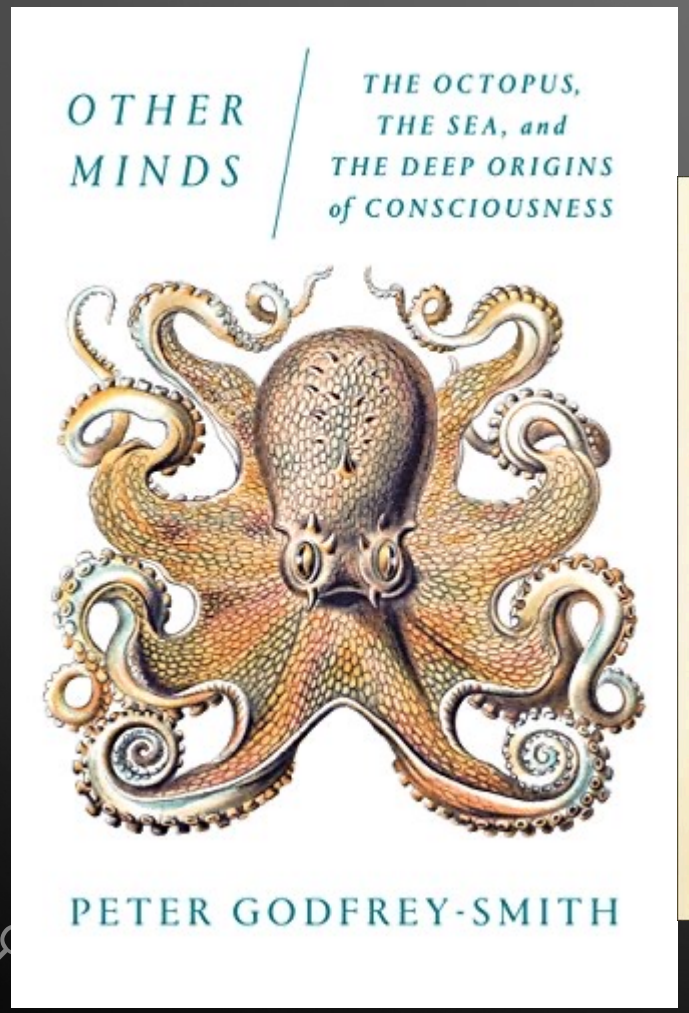
- Relationships that might be dominated by power play, racism, misogyny
- Easier to manipulate humans through evocation of social norms
- Emotional attachments and dependency
- Unmet and wrong expectations, misconception about abilities/capabilities

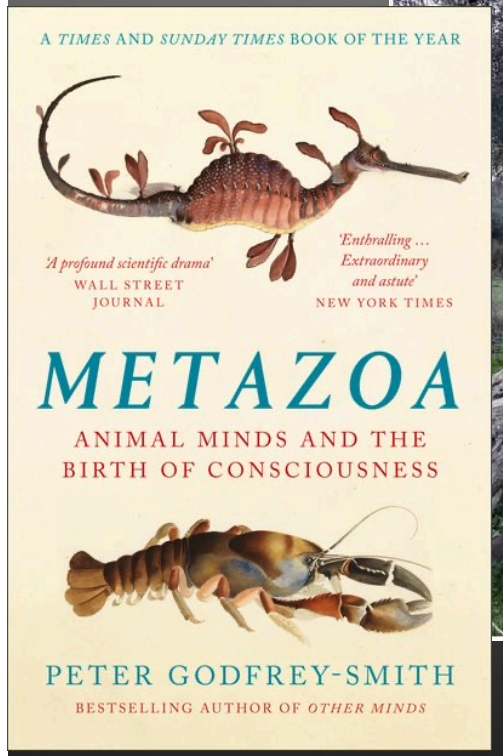
WHAT CAN WE LEARN FROM QUEER THEORY? (OR WHAT ARE BOTS' PREFERRED PRONOUNS?)

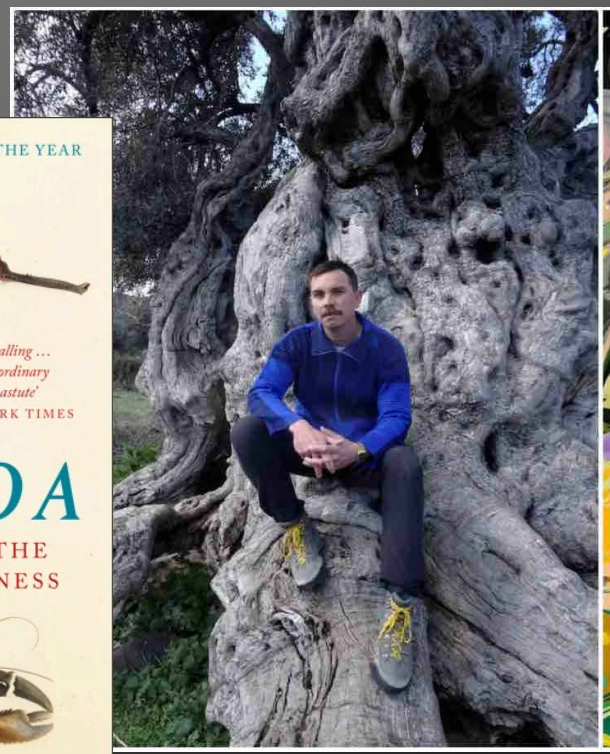
- Bots do not have to be defined by dichotomies or binaries
  - Man/woman
  - Human/machine
- Instead, they can be a spectrum of diverse identities and expressions
- Affirming change and fluidity over time

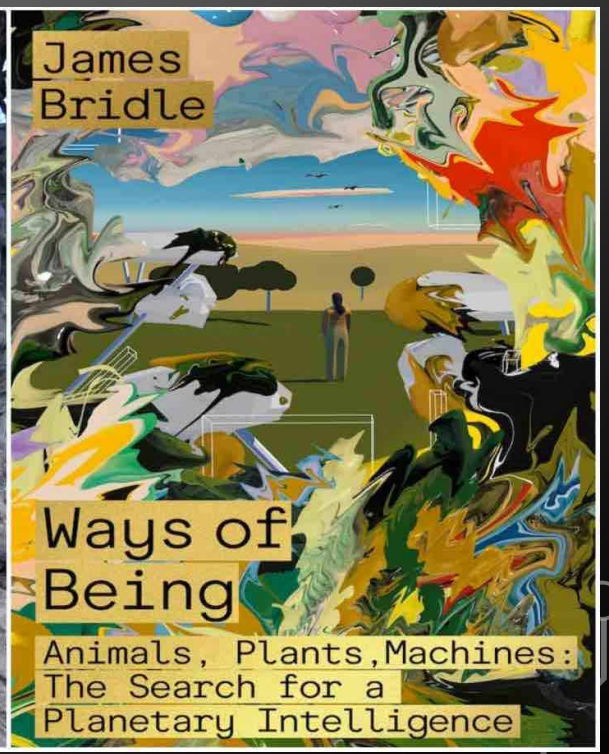
2. INTELLIGENCE IS NOT OBJECTIVE

‘MORE THAN HUMAN’ WORLD





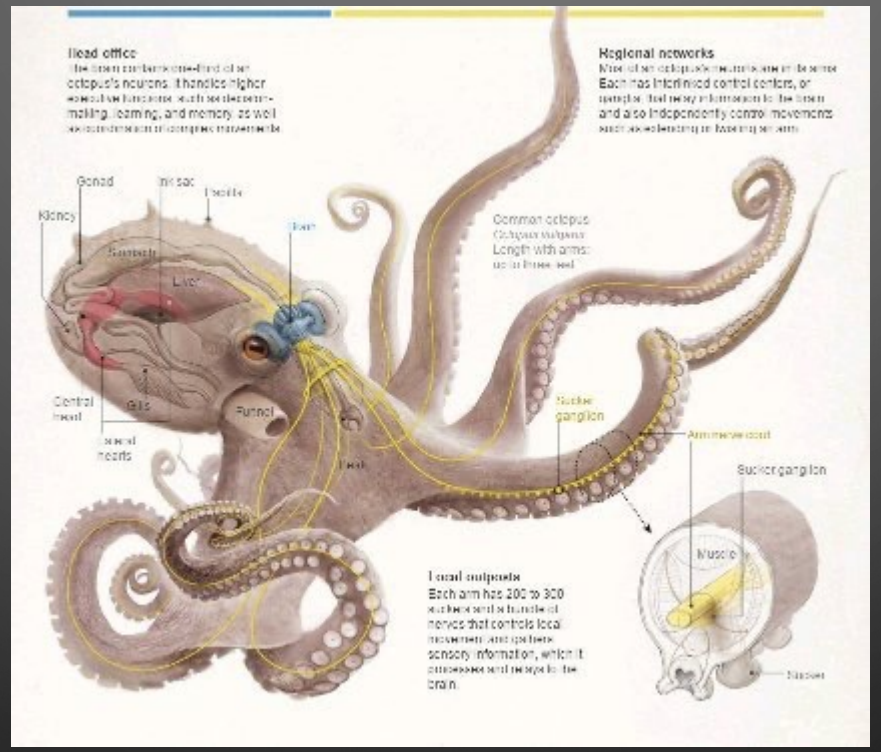




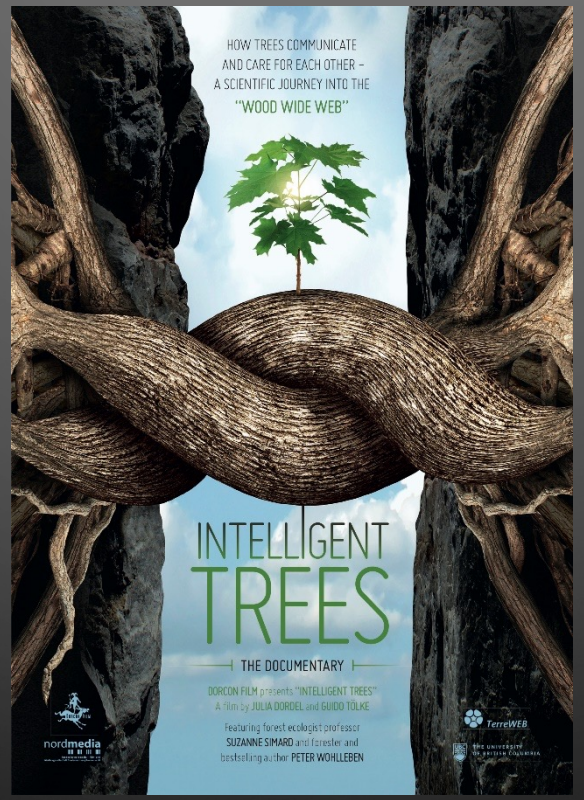
WHEN IT COMES TO AI – MAN IS STILL VERY MUCH THE MEASURE

- "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"



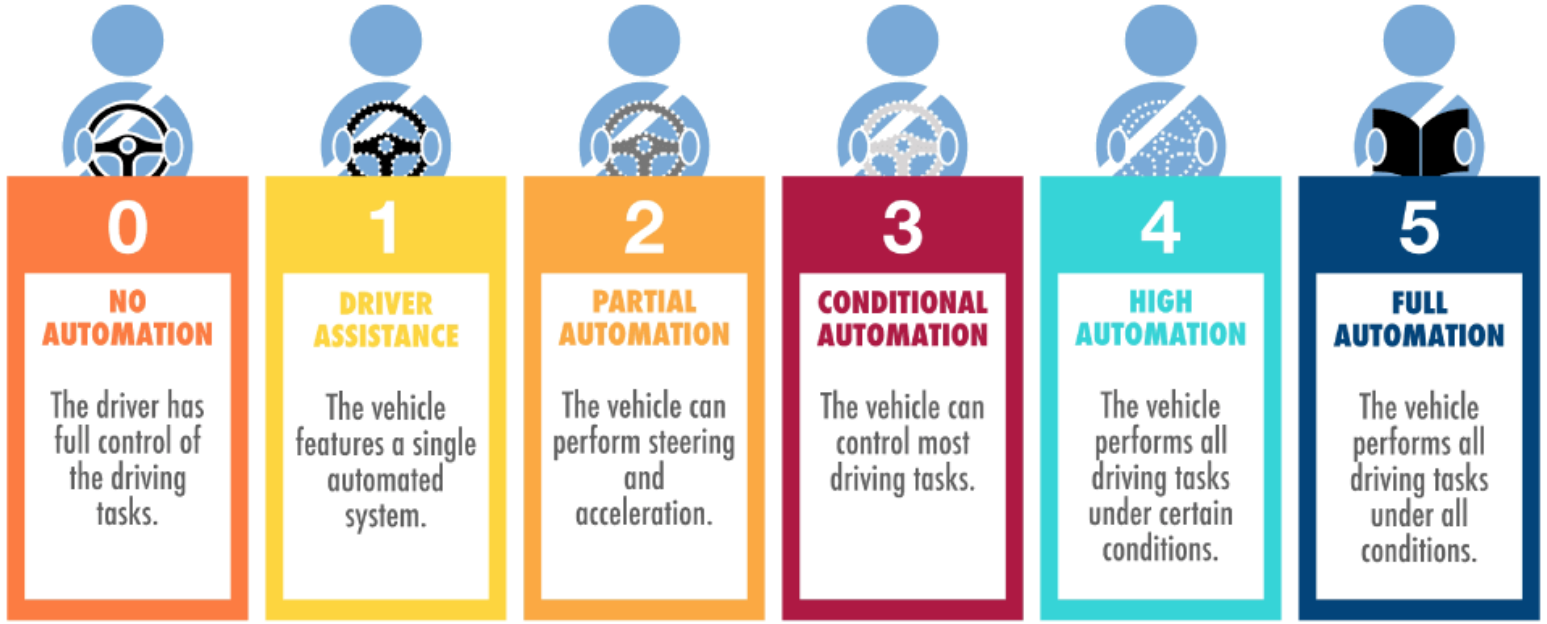
HOW GIBBONS “USE” TOOLS

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

- Expends 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

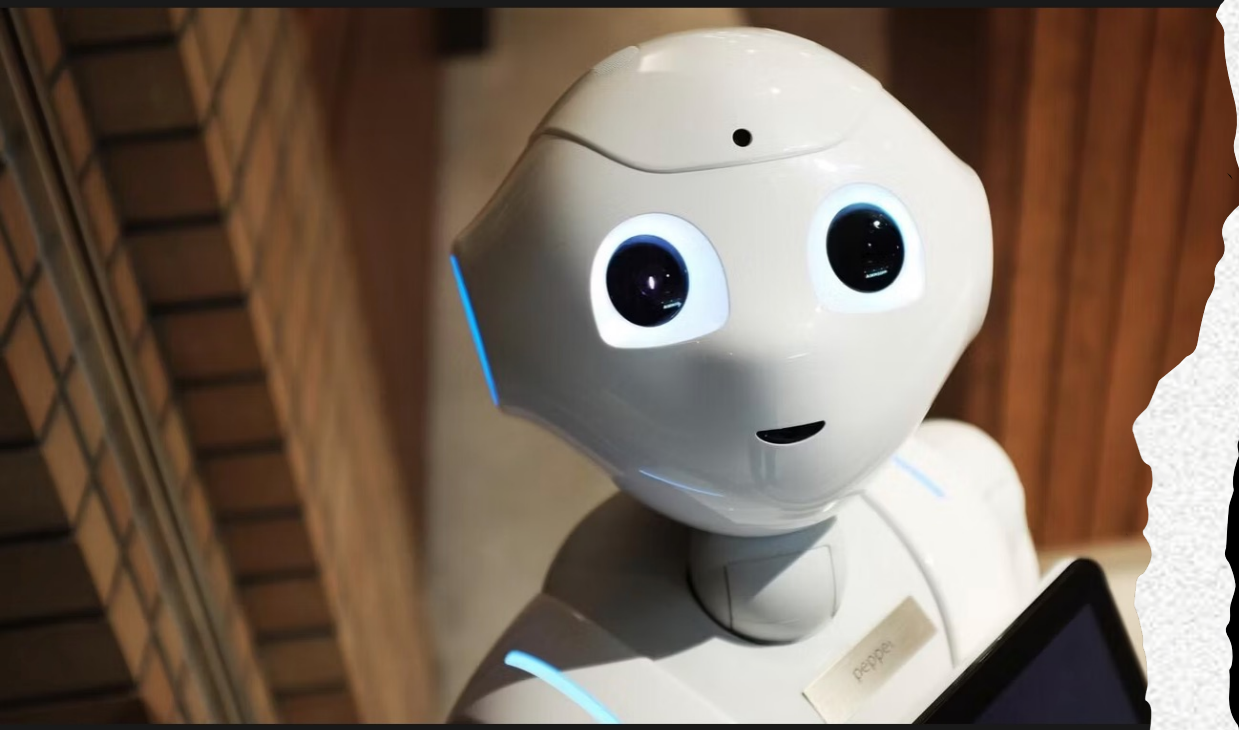
2023: Bots are a rapidly changing and evolving phenomenon

That are often vilified with no reason…

hat Are Good Bots and How Do They ffer From Bad Bots?

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

NA OT
HED SEP 27, 2021



ere's one thing that everyone online has an opinion on, it's bots. They're every oming and guiding you through web pages and sending you memes in group e bots spam your email with junk mail and crash your favorite website right w k starts.

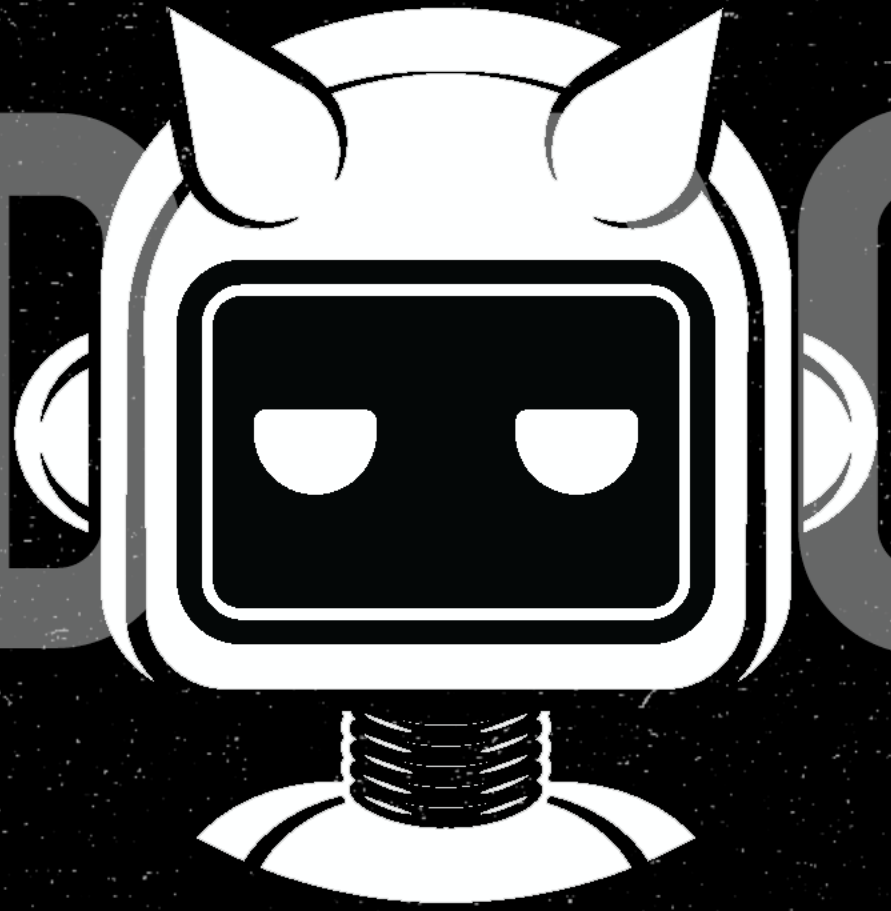
2023: Bots are a rapidly changing and evolving phenomenon

Bot Apologist!

2024: Bots are a rapidly changing and evolving phenomenon

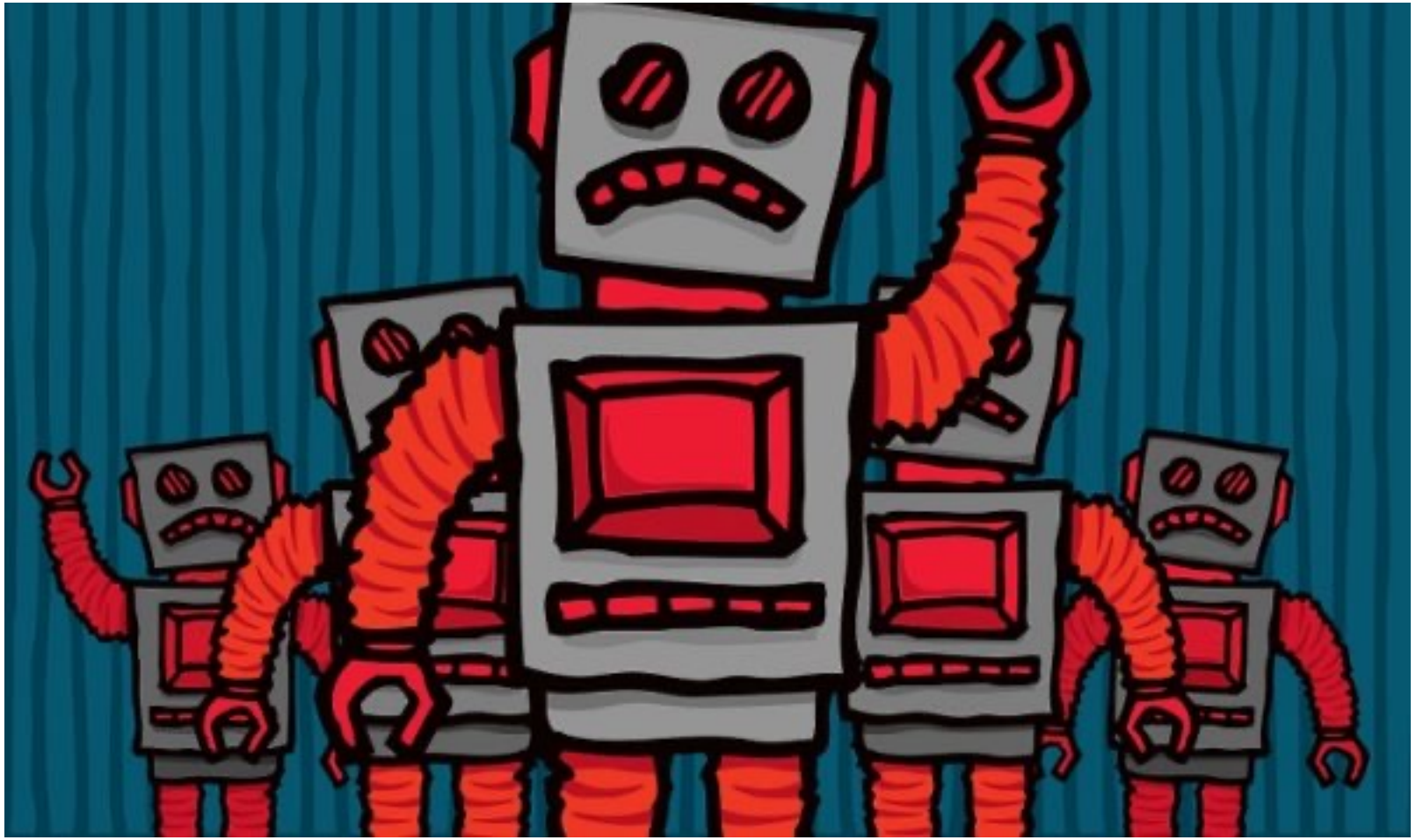
That are often vilified with good reason…

BAD BOTS



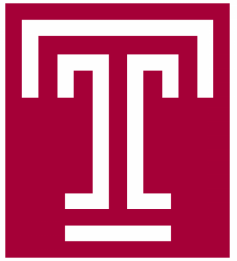
We really don’t know how they work.
We only know they are growing more sophisticated.

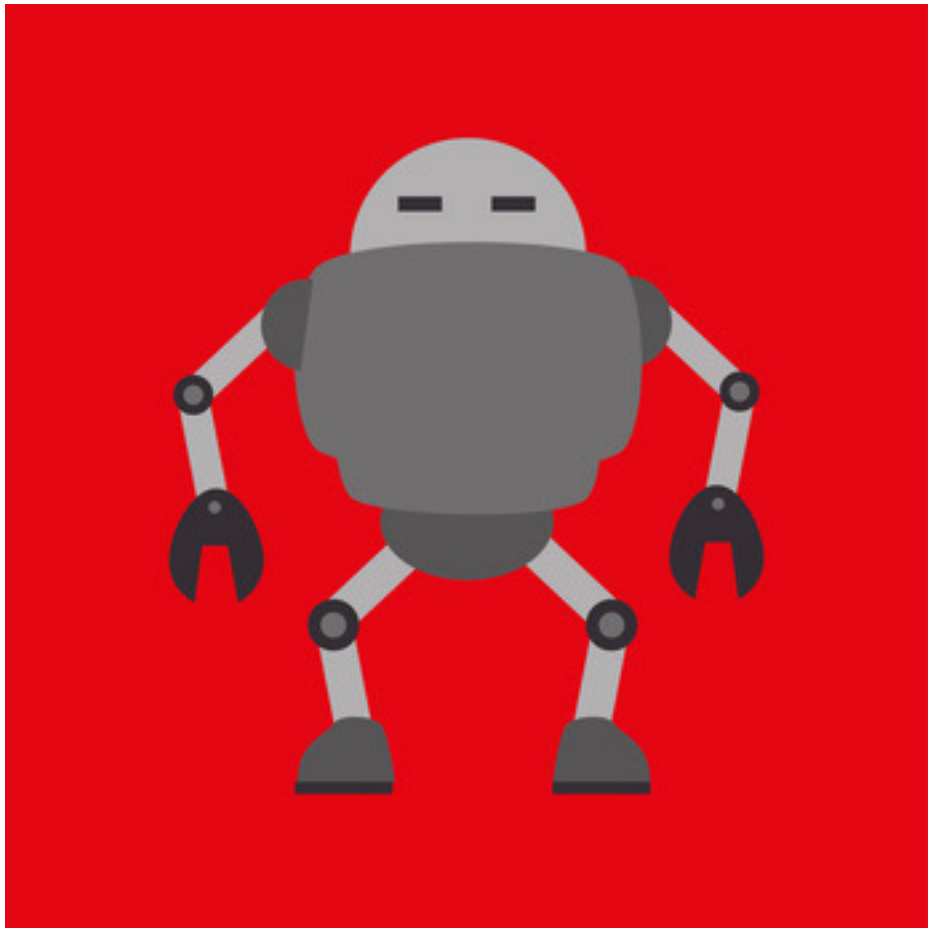
While we dither, bots are changing the velocity, the content, and the tone of sociotechnical systems.



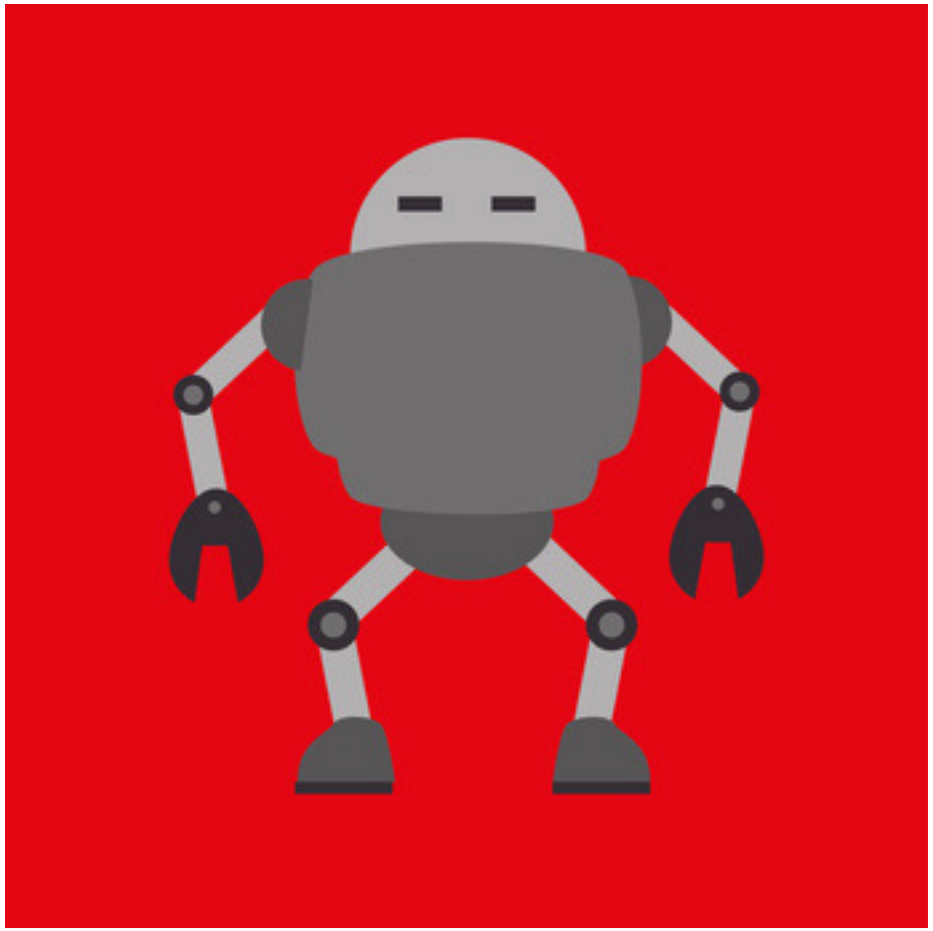
And we are learning that bots can purposefully lie, share misinformation and stoke rage in online communities

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:

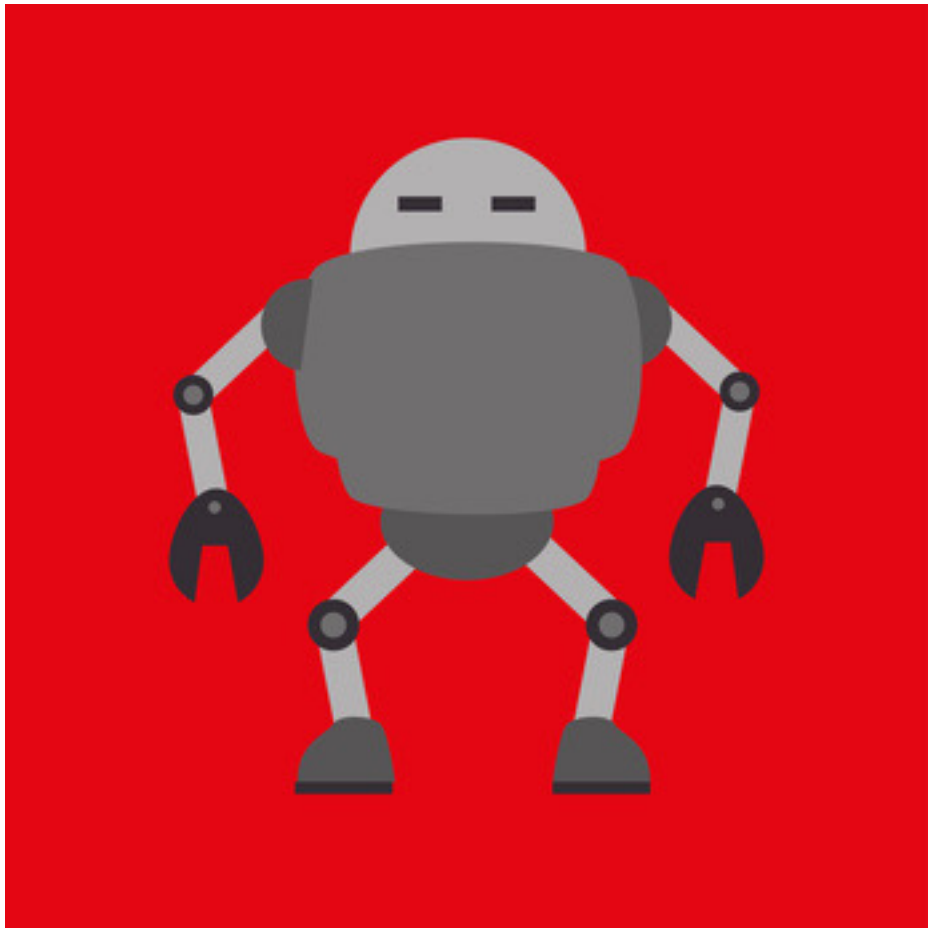
POSSIBLE ORDERING	CONSEQUENCES	
1. (1) DON'T HARM HUMANS 2. (2) OBEY ORDERS 3. (3) PROTECT YOURSELF	[SEE ASIMOV'S STORIES]	BALANCED WORLD
1. (1) DON'T HARM HUMANS 2. (3) PROTECT YOURSELF 3. (2) OBEY ORDERS	EXPLORE MARS!  HAHA, NO. IT'S COLD AND I'D DIE.	FRUSTRATING WORLD
1. (2) OBEY ORDERS 2. (1) DON'T HARM HUMANS 3. (3) PROTECT YOURSELF		KILLBOT HELLSCAPE
1. (2) OBEY ORDERS 2. (3) PROTECT YOURSELF 3. (1) DON'T HARM HUMANS		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 VAPORIZE YOU.	TERRIFYING STANDOFF
1. (3) PROTECT YOURSELF 2. (2) OBEY ORDERS 3. (1) DON'T HARM HUMANS		KILLBOT HELLSCAPE

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

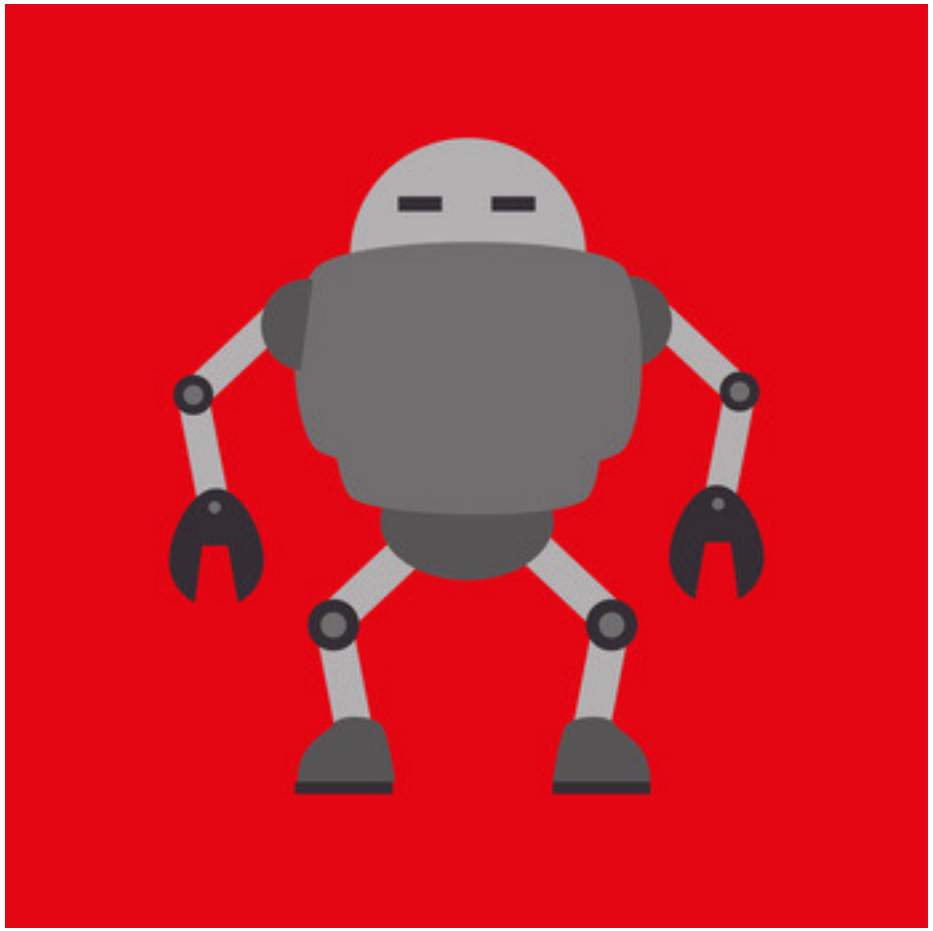
A bot must obey orders given it by human beings except where such orders would conflict with the First Law.

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

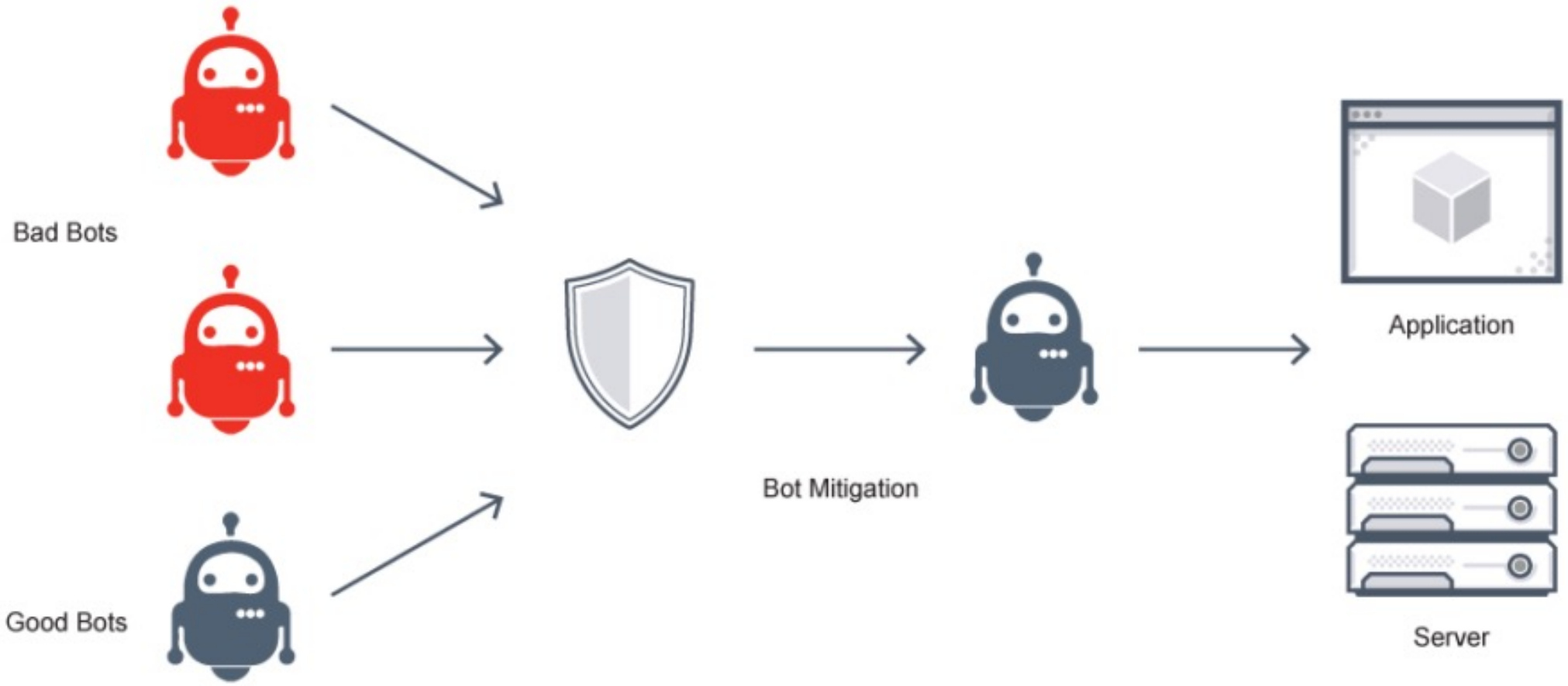
https://botnerds.com/ethics-of-bots/



Three-Tiered View
Ethical principles for bot design
Detection of bots
Human interaction with bots

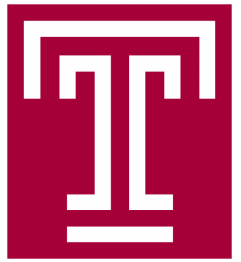


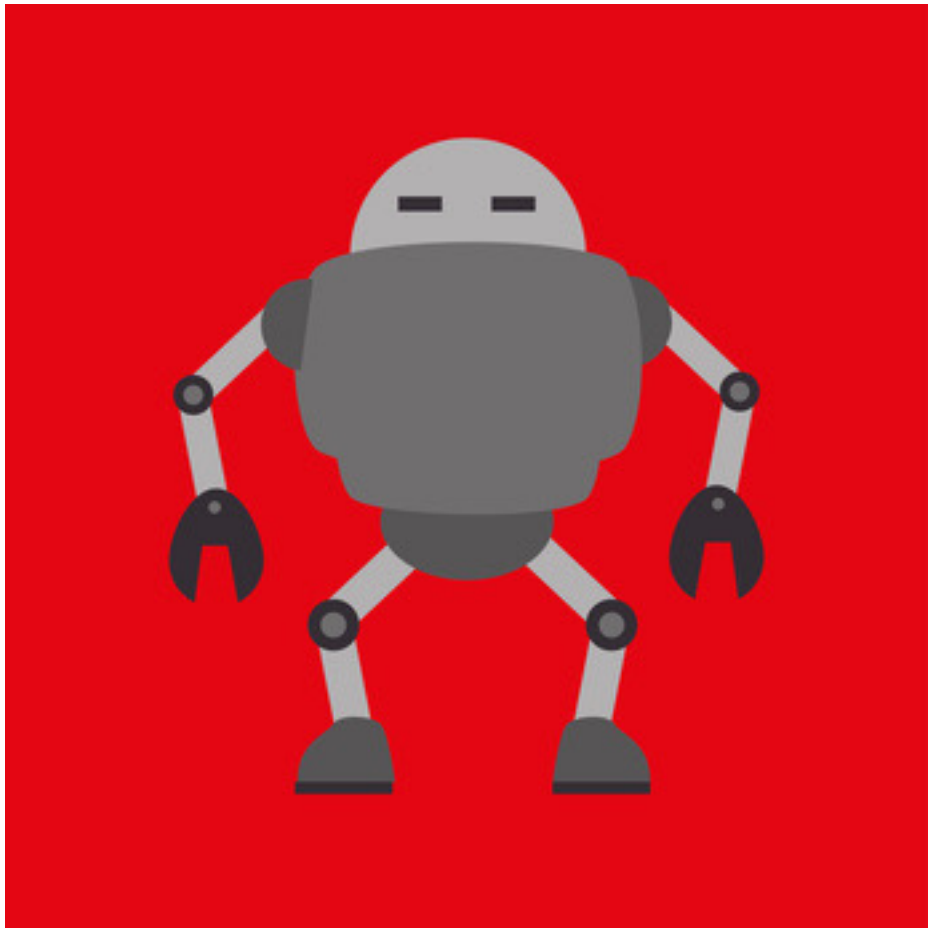
Three-Tiered View
Ethical principles for design
Build a better bot trap (attentive to platforms)
Human interaction with bots


Bad Bots
Good Bots
Bot Mitigation
Application
Server

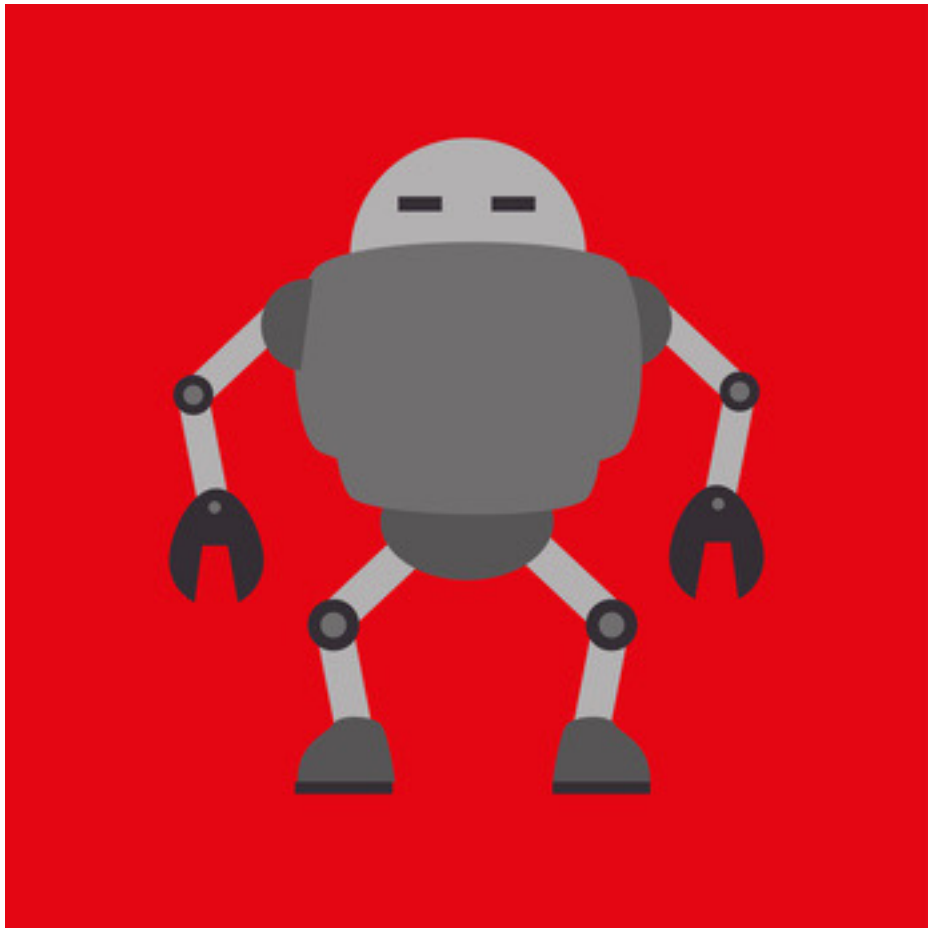
Platform owners must be accountable for creating bot-regulated environments.

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.

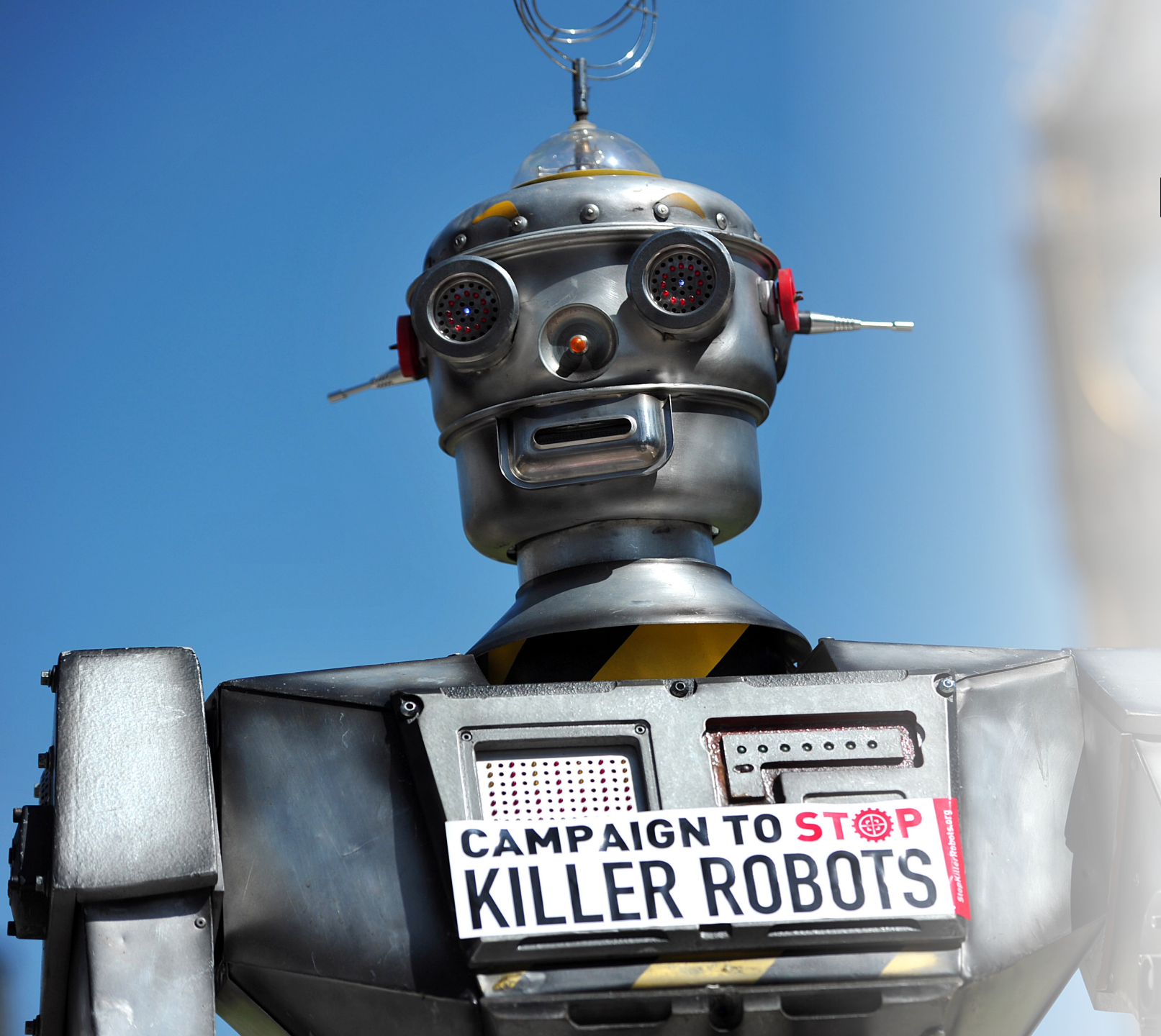
LIKE PRETTY MUCH everyone else in the past few months, journalists have been trying out generative AI tools like ChatGPT to see whether they can help us do our jobs better. AI software can't call sources and wheedle information out of them, but it can produce half-decent transcripts of those calls, and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

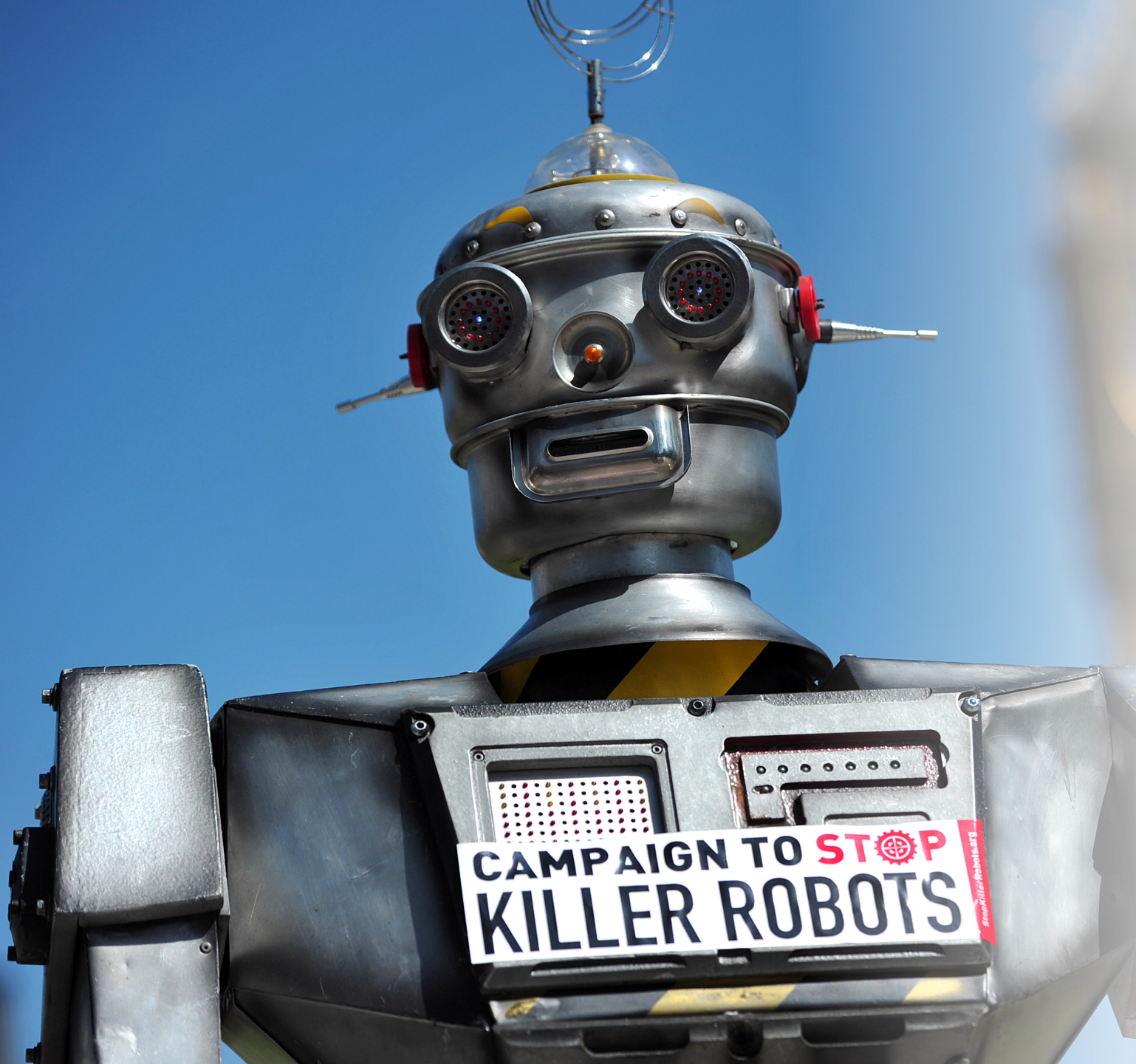
(disclosure about what?)

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

RSM Erasmus | Rotterdam School of Management Erasmus University

Terry College of Business
UNIVERSITY OF GEORGIA

RSM Erasmus | Rotterdam School of Management
Erasmus University

Thank you!

AoM PDW – Bot Theory, Methods, and Ethics

Terry College of Business
UNIVERSITY OF GEORGIA