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A Scholarly Definition of Artificial Intelligence (AI): Advancing AI as a Conceptual Framework in Communication Research

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ABSTRACT

Research on Artificial Intelligence (AI) in communication research is gaining broader interest. This interdisciplinary interest has yet to be supported by a systematic scholarly definition and by a holistic theoretical framework in communication research. First, combining prior theoretical efforts from diverse disciplines in the social sciences, especially journalism and communication, this study introduces a wide-ranging working AI scholarly definition in communication research as *the tangible real-world capability of non-human machines or artificial entities to perform, task solve, communicate, interact, and act logically as it occurs with biological humans*. We also propose its theoretical operationalization based on two dimensions: level of *performance* and level of *autonomy*, advancing an elementary conceptual framework drawing on AI's levels of potential actions or performance the AI may accomplish, including 1) performing tasks, 2) taking decisions, and 3) making predictions; as well as AI's level of autonomy, or the agency results contingent on the degrees of human input, interaction, or supervision involved.

KEYWORDS

Artificial intelligence; AI; AI performance level; AI autonomy level; social sciences; communication; journalism

Present-day society is saturated by digital infrastructures, supported by artificial technologies, which have become essential in navigating the social world (de Lima-Santos & Ceron, 2021; Hepp, 2020; Lobera et al., 2020). Rapid advances in Artificial Intelligence (AI) have significantly disrupted the world economy and other sectors like engineering, agriculture, politics, and media, developing technological-driven systems in the process of information and service creation, dissemination, and preservation (Birtchnell, 2018; Kamble & Shah, 2018; Kieslich et al., 2022; Tubaro et al., 2020). The penetration, use, and reliance on AI have various implications for different disciplines, including communication.

Some studies in communication and journalism have problematized the potential impacts of AI in shaping users' attitudes, perceptions, and behaviors (Brewer et al., 2022; Chen & Wen, 2021). For instance, AI is redefining present-day journalism through the introduction of AI-infused workflow systems, the use of data in news stories, and the reorganization of journalistic labor and recruitment (Deuze & Beckett, 2022; Sun et al., 2022). AI also has implications in communication, particularly in persuasive communication, in which scholars focus on the interplay between technology and persuasion to

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investigate how artificial entities like robotics and algorithms (Dehnert & Mongeau, 2022; Hermann, 2022; Lee & Liang, 2018; Siegel et al., 2009) may influence persuasion across diverse contexts, including political and public opinion (Cohen, 2021).

In journalism, this technology has reshaped modern investigative reporting, news production, and distribution while targeting users based on their news preferences (Stray, 2019) by employing cutting-edge AI tools (de Lima-Santos & Ceron, 2021). Thus far, researchers have identified three phases of computerization in newsrooms: automated information generation, automated content production, and information distribution and audience relations (Sánchez-García et al., 2023). Each phase influences news organizations' utilization of machine learning to predict story virality, model audience consumption patterns (Stray, 2019), and monetize website subscriptions (Goyanes et al., 2023). Additionally, personalization recommenders, bots, and algorithms have been used by major newsrooms such as *The New York Times*, *Reuters*, *China Morning Post*, and news aggregators like *Google News* and *Yahoo News* (Das et al., 2007; Sánchez-García et al., 2023).

Considering the recent academic interest in AI within communication and journalism studies and the implications of its development, it is imperative to reconcile the different research silos that have been evolving with the consolidation of AI in communication-related phenomena. However, little theoretical research has provided and operationalized a definition of AI and a conceptual framework for its empirical application in communication research. We believe this task is timely and relevant as it helps clarify empirical discourses on AI's nature, use, and effect and their social, political, cultural, and ethical implications in society. This study introduces a wide-ranging working AI scholarly definition in communication research as *the tangible real-world capability of non-human machines or artificial entities to perform, task solve, communicate, interact, and act logically as it occurs with biological humans*. We also propose its theoretical operationalization based on two dimensions: level of *performance* and level of *autonomy*, advancing an elementary conceptual framework drawing on AI's levels of potential actions or performance the AI may accomplish, including 1) performing tasks, 2) taking decisions, and 3) making predictions; as well as AI's level of autonomy, or the agency results contingent on the degrees of human input, interaction, or supervision involved.

Artificial Intelligence: Impact in Journalism and Communication

The concept of AI dates back to 1955 when Prof. John McCarthy defined the scientific procedures of machine learning (de Lima-Santos & Ceron, 2021). Over the years, this technology has revolutionized how intelligent entities are computed to simplify and perform human tasks, make decisions, and solve problems (Broussard et al., 2019). For decades, academic focus on AI mainly flourished in computer science with greater concentration on subfields such as "(i) machine learning (Ng & Leung, 2020); (ii) computer vision- CV (Russell & Norvig, 2022); (iii) speech recognition (Reddy, 1976); (iv) natural language processing – NLP (Allen, 2003); (v) planning, scheduling, and optimization (Wölker & Powell, 2021); (vi) expert systems (Benfer et al., 1991); and (vii) robotics" (de Lima-Santos & Ceron, 2021, p. 3).

The scope of AI, however, has extended globally. Journalists and communication experts, for instance, have used computational-based aid to improve their reporting (Broussard, 2015), develop more robust investigative journalism (Stray, 2019), and foster old and new

journalistic practices, contributing to better and more informed public opinion (Moran & Shaikh, 2022). AI automation has proven instrumental to journalism and investigative reporting (de-Lima-Santos & Ceron, 2021; Borchardt, 2022). Conversely, the era of pseudo-information (Kim & Gil de Zúñiga, 2021), post-factual ideas (Moon et al., 2022) have thrived in part due to the contribution of AI tools that have sparked the emergence of fake news generators, video games, and metaverse (Godulla et al., 2021; Mattke, 2018).

In communication, AI is changing social interactions, developing technologies adapted to online and offline communication (Guzman & Lewis, 2020). AI aims to intelligently replicate human communication abilities aided by computational resources (Frankish, 2014). Due to the changing dynamics in the connection between AI technologies and communication, new inquiries are being raised on how AI fits into the communication paradigms (Gunkel, 2012).

Generally, the two principal dimensions in communication technology research are human-computer interaction (HCI) and computer-mediated communication (CMC), which explain how AI might function as a communicator or a channel for human social interactions (Sundar & Nass, 2000). These dimensions are based on the usability and the ability to interpret social cues by human interlocutors. Recently, these subfields have been classified into human-AI interaction (HAII), a derivative from the Theory of Interactive Media Effects (TIME) model proposed by Sundar (Sundar & Nass, 2000), and AI-mediated communication [AIMC] (Hancock et al., 2020). Thus, the conceptual advances have facilitated the contextualization of AI as a rise in machine agency, conversational agents, and embodied robots (Beattie et al., 2020; Westerman et al., 2020). These versatilities explain how AI assists and streamlines communication (Reeves, 2016). Nevertheless, the field still needs a simple communication research framework that facilitates the study of AI for such interactions.

With the growing adoption of AI in communication, its functionality has extended from one – to-one encounter to one – to–many, thereby uncovering new assumptions about the human communication process, including deeper socio-emotional interactions (Lee & Sundar, 2009), human-AI socialization and "friendship" (Brandtzaeg et al., 2022), and autonomy – as visible in algorithmic assistants, work bots, AI co-authorship, and AI curatorship (Banas et al., 2022; Duan et al., 2022; Hepp, 2020). These facets also highlight AI's role as an intelligent-agent communicator in contrast to a simple mediator role and the degree of agency it affords humans versus machines in journalism, persuasion, and communication (Dehnert & Mongeau, 2022; Sundar & Lee, 2022).

AI is also utilized to resolve issues of hate speech and mis/disinformation online and on social media (Banas et al., 2022); conduct sentiment analysis, information pattern extraction, visual analysis, and speech recognition (Ryan, 2020; Vergeer, 2020). Additionally, communicative bots as artificial companions are becoming more popular among users (Hepp, 2020) and E-commerce enterprises for sales conversions and learning about customers' purchasing behaviors via recommender systems (Sun & Zhang, 2018). However, there are projected benefits to the future scenarios of AI technology and drawbacks to its malicious uses at individual and organizational levels (Nah et al., 2020; Araujo et al., 2020; Canavilhas, 2022; Ciancaglini et al., 2020; Helberger & Diakopoulos, 2022; Natale, 2021).

Despite the advantages of AI, there are ethical, privacy, and authenticity concerns about its deployment (Hermann, 2022; Kieslich et al., 2022). For instance, there are issues of lack of transparency and inaccuracy of AI-embedded systems in learning about users'

preferences (Jokinen, 2015), or the "cold start problem," where inferences about users may not be accurately drawn (Gope & Jain, 2017; Lee, 2020). Some examples are machine learning algorithms used in recommender systems in social media platforms like Tik Tok, Instagram, YouTube, or media streaming services like Netflix, Hulu, Apple TV, etc. There are also uncertainties about increased machine autonomy as AI gains consciousness and becomes self-aware to accelerate attention processing and emulate human-level intelligence like ChatGPT (i.e., GPT-4) and DALL-E (Chella & Manzotti, 2013; Ng & Leung, 2020). Several of these adverse effects of AI inspired the launch of the European AI Act in 2021 by the European Commission to provide binding ethical guidelines for private and public integration of AI (Helberger & Diakopoulos, 2022).

Relatedly, Volovici et al. (2022) mention how the abuse of AI in some healthcare systems can propagate prejudices like racism and sexism. Generative AI, a deep learning machine model that creates high-dimensional data from simple prompts, like texts, images, or workable prototypes in response to users' commands (i.e., ChatGPT, and Dall-E), has been identified as a potential threat to journalists (Jamil, 2021; Ciancaglini et al., 2020) and marketers due to the ability of AI to perform tasks accurately and quickly (Pavlik, 2023). Although AI tools are expected to reduce the costs of investigative journalism, current meta-journalistic conversations begin to suggest otherwise due to the uptake of algorithmic processes that undermine human involvement in news production (Borchardt et al., 2019; Guzman, 2018; Moran & Shaikh, 2022). Likewise, there are predictions of the death of journalism values as journalists grapple with over-reliance on robots in the newsrooms, raising ethical debates on how AI is appropriated in the news (Moran & Shaikh, 2022).

Scholarly Definition of Artificial Intelligence in Communication Research

The study of AI in communication has relied on broad descriptions from computer science and engineering, sociology, and legal studies as "learning algorithm used to approximate some form of intelligence operating within computing machines" (Ninness & Ninness, 2020, p. 100). In some cases, AI has been subsumed as automation in media use and production (Hepp, 2020) and categorized as general AI, which explains intelligent systems designed to conduct limited tasks as opposed to possessing similar or higher human intelligence (Ryan, 2020). The role of AI in communication and newly proposed conceptual parameters – human-AI interaction (HAII) and AI-mediated communication, are discussed by scholars based on factors like source orientation and social exchanges optimized by machine learning (Guzman & Lewis, 2020; Sundar & Lee, 2022).

Furthermore, there is a lack of operationalization of different constructs to assess the impact of AI on democracy, news media, social and political attitudes, and perceptions such as public trust (Chen & Wen, 2021).

We define AI as *the tangible real-world capability of non-human machines or artificial entities to perform, task solve, communicate, interact, and act logically as it occurs with biological humans*. AI may not solely depend on human intelligence to define its existence, and we argue that its operationalization is based on two parameters: level of *performance* and level of *autonomy*. Accordingly, this study advances an elementary conceptual framework drawing on AI's levels of performance, or the actions AI may accomplish, which include 1) performing tasks, 2) making decisions, and 3) making predictions, as well as AI's level of autonomy, as the agency results contingent on the degrees of human input,

interaction, or supervision involved. Like humans, AI will disclose different levels of intelligence based on its performance and autonomy capabilities.

Table 1 shows that AI is mostly defined as computational technique capable of actualizing specific tasks, mimicking human behaviors, cognitive heuristics, and intelligence without considering the relationship between human-human and human-machine communication patterns. Although none of definitions listed in the table below include all the different attributes proposed by the current definition offered in this article, we advance a holistic AI theoretical framework here that can largely be applied regardless of which academic definition is finally employed.

AI as a Conceptual Framework in Communication Research

Drawing on current communication studies and building on our definition of AI, we argue that AI embraces a notion that may be categorized into two levels: 1) the depth of analysis that AI can perform specific tasks, make decisions, communicate, interact, and forecast results, resulting in unique output, and 2) the degree to which AI requires or does not require human supervision or interaction. Based on these two features, our framework for explicating AI in communication research stands as follows:

Level of performance

This level of analysis, which is consistently but dispersedly discussed in the literature as an inherent feature of AI (Gunkel, 2012; Lee et al., 2023; Park et al., 2021), is implicitly appraised by extant research but lacks the consistent operationalization we seek to present next. It entails the potential actions of AI, including 1) performing tasks, 2) making decisions, and 3) making predictions. These three categories should be understood as complex actions with different levels of interaction and mutual feedback, as well as an initial approach to understand and advance a historically primitive framework of AI in communication (*see* Figure 1).

Figure 1 illustrates that AI may achieve different performance levels individually (single level), in a dual interaction (second level), in a triple interactive mode (third level), or as a series of events occurring one after the other (i.e., perform tasks – make decisions, or make decisions – make predictions, or perform tasks – make predictions – make decisions). Performing a task, for instance, can be theoretically assumed to be a simple action for AI, but as we proceed to deciding or predicting, the level of complexity increases. The level of complexity rises as the potential connections between these activities are also triggered: for example, decisions based on predictions (i.e., Gmail and Outlook text predictions, Grammarly, Google editor) or predictions based on decisions (i.e., Canva and Google search engine). What we argue here is that the output of AI depends on the intricacies of an AI interaction between its performative levels, 1) performing tasks, 2) making decisions, and 3) making predictions to produce results, and the quality of inputs an AI initially receives or its level of autonomy.

AI's level of performance can be understood through automated decision-making, which describes actions conducted using advanced technologies and without human involvement to make data-driven decisions (Dodge & Kitchin, 2007; European Commission, 2018). In other words, algorithms are utilized to gather, process, and generate data for making

Table 1. Current definitions of AI in communication research.

Author (s)	Article	Journal/Publisher	Definition of AI
Castro and New (2016, p. 2)	The Promise of Artificial Intelligence	Center for Data Innovation	The process of "creating computing machines and systems that perform operations analogous to human learning and decision-making."
Ng and Leung (2020, p. 1)	Strong Artificial Intelligence and Consciousness	Journal of Artificial Intelligence and Consciousness	"Artificial Intelligence (AI) is about emulating the human intelligence process by machines."
de Lima-Santos and Ceron (2021)	Artificial Intelligence in News Media: Current Perceptions and Future Outlook	Journalism and Media	It is a step-by-step process for performing repetitive actions, designing models, and solving technical problems without pre-existing concrete solutions.
Nah et al. (2020)	Communicating Artificial Intelligence (AI): Theory, Research, and Practice	Communication Studies	It is portrayed as the interactions between virtual and human agents across social, cultural, political, and ethical domains to enable machine imitations of human behavior and thoughts.
European Commission, Directorate-General for Communications Networks, Content, and Technology (2021)	Proposal For a Regulation Of The European Parliament and of The Council Laying Down Harmonized Rules on Artificial Intelligence (Artificial Intelligence Act) and Amending Certain Union Legislative Acts	European Union AI Act	AI systems are defined in an extensive framework, with risk-based and social-good approaches, which comprises automation in the form of structured or unstructured data acquisition, content creation, moderation, and production, predictive and recommendation systems employed for decision-making, and targeting users.
Guzman and Lewis (2020)	Artificial intelligence and communication: A Human-Machine Communication research agenda	New Media & Society	The concept of AI is focused on understanding human intelligence and developing technologies to perform tasks associated with human cognitive and emotional abilities.
Hancock et al. (2020, p. 90)	AI-Mediated Communication: Definition, Research Agenda, and Ethical Considerations	Journal of Computer-Mediated Communication	AI "refers broadly to computational systems that involve algorithms, machine learning methods, natural language processing, and other techniques that operate on behalf of an individual to improve communication outcome."
Russell (2010, p. 4)	Artificial Intelligence: A Modern Approach	Pearson Education	"A computational rational agent that acts given inputs (percepts) to achieve the best-expected outcome."
Kurzweil (1990, p. 117)	The Age of Intelligent Machines	MIT press Cambridge	"The art of creating machines that perform tasks that require intelligence when people carry them out."
Jamil (2021)	Artificial Intelligence and Journalistic Practice: The Crossroads on Obstacles and Opportunities for Pakistani Journalists	Journalism Practice	In journalism, AI extends beyond machine storytelling. It is described as the processing of natural language and the incorporation of transformed data, algorithms, and automated modes of news production and dissemination aided by news bots.

(*Continued*)

Table 1. (Continued).

Author (s)	Article	Journal/Publisher	Definition of AI
Kaplan and Haenlein (2019, p. 17)	Siri, Siri, in my hand: Who's the fairest in the land? On the interpretations, illustrations, and implications of artificial intelligence	Business Horizons	"a system's ability to interpret external data correctly, to learn from such data, and to use those learnings to achieve specific goals and tasks through flexible adaptation."
Sundar (2020)	Rise of Machine Agency: A Framework For Studying the Psychology of Human–AI Interaction (HAII)	Journal of Computer-Mediated Communication	It entails AI-driven mass personalization of communication content.
Ryan (2020, p. 3)	In AI We Trust: Ethics, Artificial Intelligence, and Reliability	Science and Engineering Ethics	"It is a field of computer science that focuses on computer processes that can often function and react in human-like ways, such as image recognition (vision), speech recognition (hearing), and natural language generation (speaking)."
Carlson (2015)	The Robotic Reporter: Automated Journalism and the Redefinition of Labor, Compositional Forms, and Journalistic Authority	Digital Journalism	It is defined as a set of algorithmic processes designed to generate and distribute media output like texts and images for general use, with limited or no human intervention.
Russell and Norvig (2022)	Artificial intelligence: a modern approach (4th ed.).	London: Pearson Education	"Study of agents that receive precepts of the environment and perform actions."
The United Nations Information Economy Report (UNCTAD, 2017, p. 5)	Information Economy Report: Digitalization, Trade, and Development	United Nations Publication	"AI refers to the capability of machines to imitate intelligent human behavior. This may involve performing various cognitive tasks, such as sensing, processing oral language, reasoning, learning, making decisions, and demonstrating an ability to manipulate objects accordingly"

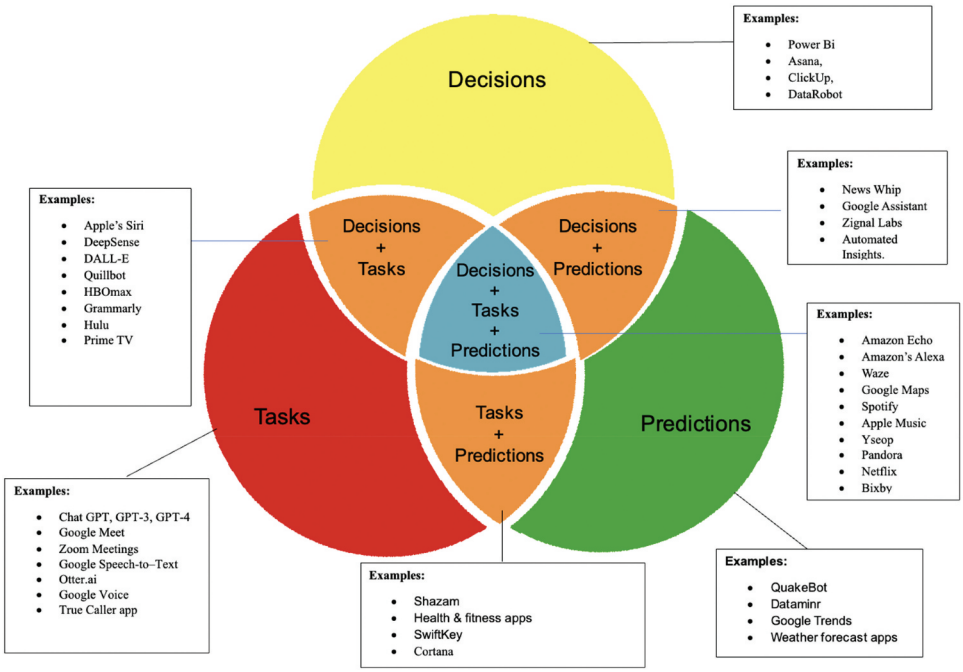

Figure 1. Venn Diagram Showing Examples of Artificial Intelligence Tools based on their levels of performance.

decisions in some aspects, including political, cultural, economic, and ethical (Elish & Boyd, 2018; Kitchin, 2017). Gunkel (2012) and Natale (2021) emphasized that AI should be viewed from a technical and material functioning of computing technologies or machine intelligence, which is pivotal in modeling the relationship between humans and machines.

In digital journalism, social bots are employed to create a scenario where AI technologies are active producers of communication, including news content (Natale, 2021). Tong and Walther (2011) mention the use of algorithms and search engines for data mining news leads and crafting prose to refine news stories. This indicates a practice of computational journalism where algorithmic tools are employed for tracking topics on public affairs (Appelgren & Nygren, 2014), analyzing big data sets (Andersen, 2018), fact-checking falsified information, and restructuring journalistic processes (Lewis et al., 2020). Some examples include Open Refine (openrefine.org) and Dedupe.io (DataMade, 2016).

Furthermore, AI may perform tasks and make predictions in aggregated forms. Vergeer (2020) reveals that the gatekeeping function of journalists is disrupted with the use of machine learning algorithms to build paywalls and recommender systems that help journalists learn about the audience's interests (Shaw et al., 2021; Gruszczynski & Wagner, 2017). It makes decisions using proprietary content management systems and statistical programs. Automated news is becoming a trend in digital journalism (Broussard, 2015), with several machine-written news pieces being created across multiple languages within minutes (Dörr, 2016; Hansen et al., 2017). Nevertheless, the importance of AI is related to automated news articles, as well as

newsroom planning, post-production, and optimization via chatbots and other AIs such as Quakebot (Salaverría & de Lima-Santos, 2020), ChatGPT, and Dall-E (Moran & Shaik, 2022).

Drawing on our AI framework, we argue machine-human interaction and online communication is also changing. Institutions are increasingly adopting machine agents or chatbots to carry out a variety of communicative tasks previously designated to humans, such as customer support (Adam et al., 2021), scheduling appointments (Srinivas & Ravindran, 2018), and personal banking (Umamaheswari et al., 2023). AI has also permeated everyday human conversations that can manage people's mental health (Adam et al., 2021), convey nonverbal expressions with emojis (Prada et al., 2018), introduce identity shifts (Gonzales & Hancock, 2008), and foster relationships (Tong & Walther, 2011). AI models like ChatGPT and DALL-E (Zhang et.al., 2023), developed by research lab OpenAI, have made headlines for their ability to function as meaningful AI. Only levels of performance and the level of autonomy will dictate how this AI will affect the world in the future.

Following the analyses of AI's functioning, a theoretical evaluation of these AI activities denotes that they should be understood as multilayered actions that require the interaction of single, dual, or triple activities at different levels. Moreover, the level of intricacy increases as mutual feedback and potential connections between these AI actions are systematically triggered. Digital streaming service Netflix, for instance, provides customized recommendations based on users' viewing history and likes (Sun & Zhang, 2018).

Major digital companies like Google, Alibaba, Amazon, and Apple have introduced conversational AI to revolutionize information systems. These bots are integrated as AI assistants such as Alexa (Amazon), Siri (Apple), Google Assistant, and Bard (Google's chat GPT-like AI), which can process instructions, engage in chit-chat, and allow users to access information (Sun & Zhang, 2018). Figure 1 shows the majority of present-day AI activities, portraying the three integral actions and their relationships.

Deuze and Beckett (2022) reference how AI-infused systems create news stories and gather public issues that resonate most among audiences through various websites or applications. There are cases of Twitter bot indicators - *Botometer* and *Tweetbotornot* - performing tasks like detecting automated accounts that collate tweets used to promote political discourses (Martini et al., 2021). With the rapid advancement in AI technology, sophisticated predictions are made using, for instance, voice recognition applications to detect health-related issues (Schulz, 2017), or algorithms to discover hidden trends from big data that might provide insights into relevant news topics (Stray, 2019).

Hansen et al. (2017) and Marconi and Siegman (2017) mentioned the impact of machine intelligence in monitoring global feeds, drawing patterns from big data sets and collating the results in writing a news story that can be shared with the audience. Today, the prevalence of AI technologies has made such theorizing a reality with several examples of machine learning used in interpersonal and computer-mediated contexts (Beattie et al., 2020; Westerman et al., 2020) and by news organizations (Marconi & Siegman, 2017; Schmitt, 2019; Wölker & Powell, 2021). However, these AI's performance levels are not exclusive to journalism or communication disciplines.

Level of autonomy

This level of analysis provides a nuance on perceptions of the potential of AI-Human interaction and has been a debate in the literature (Hancock et al., 2020; Milano et al., 2020). Theoretically assumed to be of high or low levels of autonomy, AI's autonomy discerns the agency result of the potential degree of AI or human input, interaction, or supervision involved. Fortunati (2018) references how AI communicative bots are designed as autonomously operating systems to facilitate quasi-communication between humans, and AI possesses different interfaces of communicative autonomy. The function of communicative bots depends on datafication and continuous feedback, which determines if a system is partially or fully automated, as well as the variation of oversight it affords individuals (Araujo et al., 2020; Esposito, 2017). So, the larger the amount of data processing capabilities of any given AI, the higher the automation and extent of mediatization (Andersen, 2018) and, ultimately, autonomy.

Some AI tools are developed to be "functionally automatic, to act when triggered without any regular human intervention or oversight" (Gillespie et al., 2014, p. 170) This indicates high visualization of information from databases or the internet. AI companions such as Apple's Siri, Amazon's Alexa, Microsoft's Cortana, Google's Assistant, and Shazam are autonomous systems that meet human socio-communication needs (Diakopoulos, 2016; Hepp, 2020; Selwyn & Gallo Cordoba, 2022). Nevertheless, these AI tools provide various degrees of control for users. Shazam, for instance, gives users extended control over their music consumption because it is designed to identify songs via a smartphone's microphone and propose music using search results saved in users' databases (Hepp, 2020). This conceptualization of AI-enabled interaction, thus, deals with humans' control over AI and not the opposite. Results of a fully supervised AI technology may imply different societal, economic, or human risks, assuming that if humans fully control AI technologies, this may influence fewer risking outputs, as opposed to a fully autonomous AI technology close to the cutting-edge technological singularity.

Discussion

Many news agencies employ AI tools to enhance their users' experiences (Lee et al., 2023) and improve automated news production and distribution (Deuze & Beckett, 2022; Moran & Shaikh, 2022), redefining our society (Barredo-Ibáñez et al., 2021; Dehnert & Mongeau, 2022; Siegel et al., 2009). AI represents a fundamental role in many strands of society, from industries to scholarship, including communication as a field. Thus, it is crucial to define its core processes and provide a framework aiming at capturing the broadness of its application in communication research. Furthermore, as AI grows rapidly, predominant theories on communication research only provide a partial perspective of AI's framework. Hence, our proposed definition of AI broadly conceives the complexity of AI based on its level of performance and autonomy and the procedures involved. This study provides a holistic scholarly definition of AI as the tangible real-world capability of non-human machines to perform, task solve, communicate, and interact as it occurs with humans.

AI's levels of performance and autonomy situate theoretical perspectives of human-machine interaction and the variants of the practices conducted by AI. These classifications will help scholars and users reimagine the different uses of AI

systems and their outcomes for various issues. Scholars, for instance, could investigate the potential and effects of computational journalism to deepen conversations on AI's formative role in the newsroom and examine audiences' reaction to AI-generated news vs. journalist-written news. Future studies may explore the psychological effects of AI literacy on individuals' expectations of how an algorithm's performance might help them distinguish between fake and real news, thereby increasing fake news literacy among audiences who consume news from social media or alternative media, which are known as hotspots for the spread of misinformation (Lee et al., 2023; Mason et al., 2018).

Moreso, there is an uncanniness in how AI can accentuate social and digital disparities. With the growing popularity of generative AI models like Chat GPT, GPT-3, and GPT-4, there is an opportunity to leverage AI's performance and autonomy in designing empirical studies on the personalization and human-like conversational metrics of AI agents to explore the emotional intelligence in human-AI interactions and its impact on users' perceptions. Following the distinctions of AI, it is clear that media and communication studies will pose different research questions and attempt to address debates on the communicative relationship between humans and AI, including ethical contentions.

Numerous AI challenges need to be faced by academics and policymakers. Diverse AI-like communicative robots, for instance, are based on the premise of the accumulation of individual private data, so there is a need for a clearer understanding of what data is public or private when AI is embedded in users' social spaces (Lutz & Tamó-Larrieux, 2020) as developers make specific trade-off decisions that may threaten the ethical design of AI tools. Additionally, it is critical to bring about the notion of AI *accountability*, that is, who bears the responsibility for AI intrusion in users' private spaces (Gunkel, 2018). AI systems may run the risk of undermining transparency for users concerning the machine learning process (Liao et al., 2020) and disclosure of the methods of data collection and the extent of individuating information collected (Sundar et al., 2013); tracking their data, and monitoring their digital footprints such as interests and media use patterns.

Over time, different institutions like the European Union continually address such issues through policymaking (Canavilhas, 2022) and the U.S. Congress is also considering AI's implications to society and the health of US democracy. The most recent case is the Tik Tok Congressional Hearing on privacy invasion, data security, political propaganda, and child safety (Shepardson & Ayyub, 2023; Tolentino, 2023). Despite the risks and vulnerabilities caused by the advancement of AI, this Forum article aims to present a standard working definition of AI in communication and provide a conceptual framework for understanding how AI models are structured, extending research on the examination of their future influence in society.

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