

Research Paper Artificial intelligence and the United States Federal Government

Introduction

The dictionary defines Artificial Intelligence (AI) as “The capability of a machine to imitate intelligent human behavior” (Merriam-Webster, n.d.). Dr. John McCarthy, the person that coined the term AI, said in 1955 that one day “... every aspect of learning and other properties of intelligence can be described so precisely that a machine can simulate it” (Lischka, 2011). AI stands to impact all areas of the global society. During the mid-18th century, the first industrial revolution resulted in goods and services being produced by machines. “Hard” capital (e.g., railways, steam engines, etc.) were essential inventions during this phase. The second revolution began at the end of the 19th century with electrification and “soft” process innovations (e.g., the assembly line). The third industrial revolution started in the 1970s and was distinguished by further automation through electronics (e.g., personal computers, the internet, etc.). AI is being called the fourth industrial revolution. This newest revolution is the technical integration of electronics and physical systems. Now production is becoming controlled by decentralized self-organized machines being optimized in real-time (Lischka, 2011). AI is a General Purpose Technology (GPT) and as such will be pervasive, improve over time, and create even newer innovations (Brynjolfsson & McAfee, 2014). AI has a wide range of applications, including natural language processing (i.e., allowing computers to understand language), machine vision (i.e., enabling computers to see objects), and automated model building (i.e., allowing machines to operate autonomously) (Chen, Christensen, Gallagher, Mate, & Rafert, 2016). Much of the technology and techniques that underpin AI have existed for decades; however, the recent explosion of computing

power and speed combined with the ever-increasing digitization of data (Calo, 2017) has allowed AI to become a potential bogart of humanity. By 2029, Kurzweil (2005) sees nonbiological intelligence matching the range of human intelligence and what he calls the “Singularity” – the point at which AI surpasses human intelligence - occurring by 2045 (Pratt, 2015). The impact AI will have on economics (see Frey & Osborne, 2017; Smith, 2019; Wisskirchen, et al. 2017; Pisani, 2015), military and security systems, AI itself, and, ultimately, the distinction between humans and machines, is of great concern to many; both in the private and public sectors.

Roadmap

This paper will first explore the social-political concerns animating public discourse associated with AI development and why they appear to be gathering an increasing response from the United States (US) federal executive and legislative branches of government. Next, the paper will explore the literature regarding the US federal government’s legal, executive, and legislative response to AI. The paper will note that while there has been considerable discussion about why and how AI should be regulated, there has been little discussion regarding the political actors participating in AI regulation. Finally, the paper will add to the existing literature by reviewing the characteristics of current and proposed legislation and the nature of the ideologies of those political actors contributing to the advancement of AI regulation at the US federal level.

Concerns Animating AI Public Discourse

Global Competitiveness

Using multiple estimation techniques (i.e., implied impact of private industry investment, indicated effect of venture capital investment, and benchmarking using past technological advancements), one study projected the global economic implications associated with the use, development, and adoption of AI over a ten year period, to range from \$1.49 trillion to \$2.95 trillion (Chen et al., 2016). US

involvement and leadership in this market is a key factor in national competitiveness. The perception of, or actually, falling behind in this tremendous global AI market is likely to come at a great political cost.

Privacy

AI can increasingly create intimate personal profiles from available data. The capacity of AI to recognize previously undetectable patterns threatens to shatter the already unstable boundary between what is public and what is private. By sharing innocent personal information, for example, where one buys clothing or what one purchases from the grocery store, individuals can provide AI enough data to uncover sensitive personal insights about themselves. In the US, the interpretation of the Fourth Amendment by the courts has led to the consensus that citizens have no expectation of privacy in the public domain. Additionally, US privacy laws favor company use of customer information to its maximum commercial benefit. However, when everyone in the public can be identified through AI facial recognition, and a person's "public" facts allow AI to derive private facts, citizens will raise public concern (Calo, 2017; Schippers, 2020). One recent example that created public outcry came from the uncovering that data belonging to over 87 million Facebook users was gathered by Cambridge Analytica without prior consent and then passed on to third-party organizations who used it to manipulate the views and opinions of American citizens in order to influence the outcome of the 2016 US presidential election (Assibong, Wogu, Sholarin, Misra, Damasevičius & Sharma, 2020). Another example of increasing national awareness of technology's ability to invade personal privacy was Edward Snowden's 2013 revelations about how the National Security Agency was surveilling US citizens (Madden, 2014). As such "private" data becomes increasingly available, similar occurrences will create similar alarms, and the public will demand legislative action.

Bias

AI and algorithmic bias occur when a system produces undesirable or unfair results. AI systems must be trained on existing data. Existing data, in part, was/is created by human input. Thus, these training data sets will often contain human biases in some way. It is also possible that the operation of the algorithm itself might create preferences. For example, recruiters are going to favor the competent, other things being equal. However, if certain groups in a recruiting algorithm are less represented than other groups because they are identified as more capable by the algorithm, the algorithm can produce bias results (Boddington, 2017). Given the US heightened racial, gender, and sexual divisions, public scrutiny of this type of bias, once discovered, will bring political outcry. The Black Lives Matter movement which has elevated racism to the national level (Freelon, McIlwain & Clark, 2016). People of color are disproportionately arrested and imprisoned (Warde, 2013), resulting in people of color being overrepresented in governmental databases (Eubanks, 2018; Madden et al., 2017). This overrepresentation causes that demographic to become subjects of greater surveillance. Advocacy and activism around these problems have increased local and national concerns in this area (Young, Katell & Krafft, 2019).

National Security

The movie “The Terminator” (Cameron, 1984) is a well-known dystopian future of which the public is aware. Today drone strikes are frequently in the news and robot dogs are appearing next to police officers. Certainly, the military aspects of AI are part of the public consciousness. According to the Boston Consulting Group, the worldwide spending on military robotics (narrowly defined as only unmanned vehicles) will reach \$16.5 billion by 2025 (Sander & Wolfgang, 2014). The impact of AI on US national security is becoming a very important state issue. AI has the potential to be militarily transformative on a par with nuclear weapons. The US will not be an insignificant player in this new

global arms race. American politics and the military-industrial complex will not tolerate US failure in this arena. Advances in AI will affect many issues of military security. Progress in AI will enable new capabilities and make existing capabilities affordable to a broad range of actors. For example, commercially available AI-enabled technology (such as drones) may give weak states access to a type of long-range precision strike capability never before available. AI-enhanced forgery of audio and video media will challenge the basis of trust across institutions. Propaganda for authoritarian regimes will increasingly become indistinguishable from truth. The US will have to stay competitive in this arms race and defend itself against these new AI realities.

Labor

From a social-political view, the impact on employment is always a predominant concern. David Ricardo wrote that the “substitution of machinery for human labor is often very injurious to the interests of the class of laborers” (Ricardo, 1821). The critical question for labor is: “what will the role of humans be at a time when computers and robots ... [can] ... perform as well or better and much cheaper, practically all tasks that humans do at present?” The optimists argue that humans will be able to spend their time performing activities of their choice and working, when they want, at jobs that interest them. The pessimists conclude that AI will make humans an endangered species (Makridakis, 2017). As indicated in a 2019 survey by Pew Research Center, the public appears to be pessimistic; 65% of US citizens expect that within 50 years, a robot or an intelligent algorithm will be doing their job (Smith, 2019). These concerns are being fueled by headlines such as one that appeared in a 2013 report by Frey and Osborne (2017) stating 47% of total US employment is at risk from AI develops. In high-wage countries, such as the US, the higher wages induce adoption of the automated technology faster since it saves labor costs (Zeira, 1998). Optimists might be overstating the potential for an AI driven utopia, but there is historical evidence that technology driven advances typically created more jobs than it has destroyed; although there will likely be a transitional period of increased

unemployment until new opportunities are created (Stewart & Cole, 2015). During the transitional phases or if laborers become permanently unemployed, how social security systems will compensate and ultimately pay the costs will be a central social-political issue. In the US, companies will likely share the short-term expenses through dismissal severance payments or by bearing employee retraining costs. However, it is likely that many people will not be able to be retrain. These people will become long-term unemployed and will have to be supported by the state. The financial pressure on the social welfare system will become a central economic political problem (Wisskirchen et al., 2017).

Safety

AI will empower more robot and human interaction in the workplace. Additionally, new AI powered consumer products will proliferate. Safety regulations and insurance laws will need updating to adapt to the newer technologies. Unions and the general workforce are likely to become more politically active in seeking workforce safety (Wisskirchen et al., 2017).

US Election Integrity

AI and technology can enhance the democratic process by creating “communication platforms that facilitate public debate, connect people, and ease the flow of information” (Schippers, 2020). All solid elements of democratic discourse. However, there is the potential for AI applications to undermine the political process. As noted earlier, the unauthorized accumulation of 87 million Facebook user data and its use in the 2016 presidential election created public visibility into the potential for privacy violations (Assibong, Wogu, Sholarin, Misra, Damasevičius & Sharma, 2020). However, that is but one-half of the story. Social media bots are programs that do legitimate tasks like collecting and delivering information, communicating between systems and people, and recommending news postings. They can also be used for malicious activities like spamming and harassment. Media bots can appear to be human users while rapidly deploying messages to many actual human users. Some social media bots are designed to

strengthen online political propaganda which appears to be what happened with the data from the 87 million Facebook user. The term “computational propaganda” refers to the intersection of social media bots, independent AI agents, and big data intended to manipulate public opinion. This type of algorithm can be deployed on social media to fabricate trends, take advantage of hashtags, amplify content, spam and attack oppositional views. In the hands of resourceful politicians, these automated tools can be used both to promote and silence communication and mobilize citizenry (Woolley & Howard, 2017). The public was exposed to just such malicious efforts during the 2016 presidential campaign. News stories began to appear online that the presidential candidate, Hilary Clinton, was involved in serious crimes and information was delivered to voters giving them the wrong day to cast their ballots. Other exciting but misleading and egregiously harmful stories also appeared (Kane, 2019). Following whistleblower testimonies and journalistic exposure of this type of AI politicking, there was a public outcry regarding the threat these technologies pose to the sanctity of elections in America (Assibong, Wogu, Sholarin, Misra, Damasevičius & Sharma, 2020).

Literature review

Introduction

Much of the AI literature notes that AI has so far developed in a relatively legal and regulatory vacuum. Virtually no courts have set standards addressing who should be liable when AI causes harm (Scherer, 2015), and only recently has there been legislative action. In 1960, there were calls for John F. Kennedy to hold conferences over concerns that robotics would replace human labor. No discussions were held. Later there were calls to form a Federal Automation Commission. It was not formed. There appears to have been no hearings on AI in the US House or Senate until 2016 when the House Energy and Commerce Committee held a hearing on Advanced Robotics (i.e., robots with AI) and the Senate

Joint Economic Committee held the "first-ever hearing focused solely on artificial intelligence" (Sen. Ted Cruz, 2016). That same year, the Obama White House held several workshops on AI and published a few reports detailing its findings (Calo, 2017).

However, AI public concerns appear to be penetrating public consciousness and now driving increased regulatory review. Notable figures such as Elon Musk, the CEO of Tesla Motors and a supporter of AI development, have eschewed the technology sector's general skepticism of governmental regulation. In an interview at MIT's 2014 AeroAstro Centennial Symposium, he said, "I think we should be very careful about artificial intelligence. If I had to guess at what our biggest existential threat is, it's probably that." He continued, "I'm increasingly inclined to think there should be some regulatory oversight ... just to make sure that we don't do something very foolish" (Graef, 2014). Mr. Musk's concerns are echoed by the public. A 2018 Center for the Governance of AI survey found 84% of Americans believe that AI needs careful management, and such control is of high importance (Zhang, 2020).

AI Regulatory Challenges

The industrial revolution brought mechanical processes into the production line. These devices needed to be operated by workers. This often brought workers into close contact with machines, under extreme conditions, and for long hours. Clashes between workers and employers inevitably arose. As this environment persisted, public awareness eventually brought about new labor laws requiring employers to deliver a reasonable level of humanitarian standard to their workers. Similar legislative efforts followed each new revolutionary technology (i.e., electricity, railroad, telephone, automobiles, television, and computers) (Gurkaynak, Yilmaz & Haksever, 2016). While previous revolutionary technologies had a comparatively physical nature, AI is more mysterious, and the literature is replete with the challenges it will present. Some challenges are practical and others conceptual. For example, how are the inherent difficulties in controlling the actions of these autonomous machines to be

managed? Conceptually, who should be responsible when an AI system or autonomous machines acts “on its own” in unforeseeable ways (Pratley, 2015)? The general AI mystery manifests itself in definitional difficulties. This complicates the regulatory stage. Exactly what is “artificial intelligence?”

When policymakers do not have clear definitions, they will be challenged to regulate correctly (Howe, 2019). They may not know which systems fall under which existing or proposed laws. A 2020 study of current AI research and policy proposals by Krafft, Young, Katell, Huang, and Bugingo (2020) found that “while AI researchers favor definitions of AI that emphasize technical functionality, policy-makers instead use definitions that compare systems to human thinking and behavior” (Krafft, Young, Katell, Huang & Bugingo, 2020). The study concluded that functional definitions are more inclusive of currently deployed AI systems, whereas definitions emphasizing human-like capabilities are most applicable to hypothetical technologies. Thus, policymakers potentially risk overemphasizing future AI systems at the expense of those systems currently deployed (Krafft, Young, Katell, Huang & Bugingo, 2020).

The question of AI responsibility presents regulatory difficulties. AI can act in human-type ways, but neither national nor international law recognizes AI as a legal person. Like humans, AI can have the ability to train itself, accumulate experience, and make decisions independently. One example was “Gaak’s great escape.” Gaak was a robot from the Magna Science Center (see Roff, 2016) that was programmed to seek and destroy other robots that were its prey. Gaak was left unobserved for several minutes. Through independent decision-making, Gaak learned about its environment and discovered an opening that allowed it to explore beyond its confines. Ultimately the Gaak made its way to a street outside the building and caused a traffic accident (Čerka, Grigienė & Sirbikytė, 2015). Gaak’s great escape, while somewhat humorous, is a small example of AI’s emergent properties. AI algorithms are likely to begin to dispense health and legal advice, requiring adherence to complex fiduciary duties and human-type judgment. Doctors and lawyers must complete years of schooling and board certifications before they are considered competent. What happens when an AI doctor or lawyer carries out a new

procedure or dispenses novel advice? “Who” is accountable (Calo, 2017)? Worst yet, what if an autonomous AI system is actually “aware” that its actions will cause harm and knowingly and willingly proceeds to cause injury (Gurkaynak, Yilmaz & Haksever, 2016)? These potentially harmful behaviors might seem remote, but they can occur given the nature of any goal-driven system (Omohundro, 2008).

One challenge faced by both regulators and the public has been called the “Minsky Fallacy.” An apocryphal tale where an original AI researcher, Marvin Minsky, assigned one of his students a summer project to build a computer vision system. The project was to produce a program capable of recognizing various images. Minsky vastly underestimated the difficulty of this task. The summer project turned into decades of work (Young, Katell & Krafft, 2019). What humans do without effort can require extremely complicated and intricate programming. Moreover, there is often a failure to recognize that AI algorithms are situated within social contexts (Ananny, 2016; Mittelstadt et al., 2016) and can only be relationally visible to the end-user (Star & Ruhleder, 1996). In general, limited lay understandings of algorithmic systems may inhibit effective policymaking (Danaher et al., 2017).

AI presents many challenges to ex ante regulation, but it is also challenging for ex post evaluations by the court system. Ex post judgments are difficult because AI development can be discreet (i.e., requiring little physical infrastructure), discrete (i.e., different components may be designed without conscious coordination), diffuse (i.e., developed by many geographically dispersed individuals), and opaque (i.e., self-constructing nature of AI makes harmful features difficult to detect). Importantly, the autonomous nature of AI creates legal issues of foreseeability (Scherer, 2015). As eluded to above, AI can lead to systems that generate unexpected solutions. Humans are bounded by cognitive limitations and can analyze only a limited amount of information available. As such, AI may come to be seen as a superseding cause - that is, “an intervening force or act that is deemed sufficient to prevent liability for an actor whose tortious conduct was a factual cause of harm” (Restatement (Third) of Torts, 2010) - relieving its “creator” of liability (Pratley, 2015).

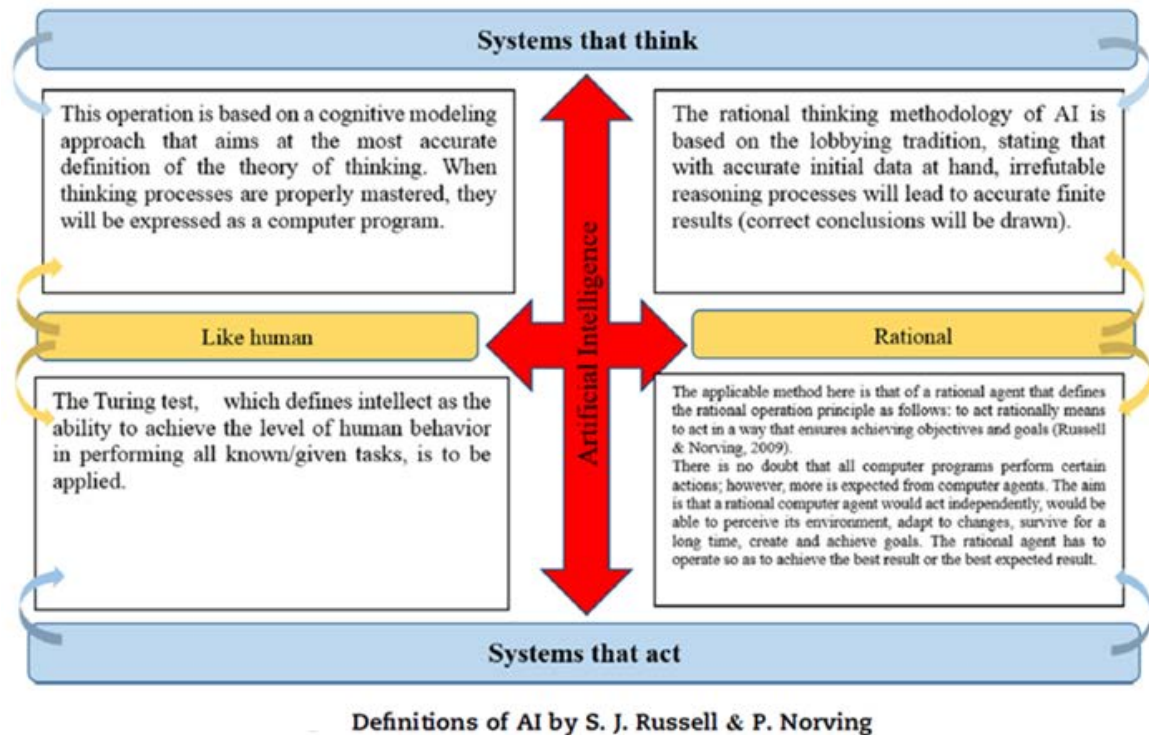
AI autonomy not only creates problems of foreseeability but also of control. It may be difficult for humans to maintain control of autonomous machines once it is lost. Malfunctions might be caused by random file corruptions or physical damage to input equipment. Superior computer response time might result in the AI system acting on the malfunctions before being detected and corrected by human actors. Flawed programming might result from a conscious design choice that produces unintended consequences. Again, the loss of control may take time to detect, and once noticed, it may be difficult, if not impossible, to regain, especially if the AI is programmed to learn and adapt (Pratley, 2015). These issues make assigning ex post responsibility and blame difficult for the courts (Gurkaynak, Yilmaz & Haksever, 2016; Scherer, 2015).

General AI Regulatory Proposals

There is abundant literature addressing the potential problems presented by AI. Fortunately, there is also literature addressing what might be done to address these challenges. One suggestion is to do little. Calo (2017) suggests that it may not be feasible to develop laws regarding AI at this early stage. Calo (2017) recommends that it might be better at this time to develop the necessary expertise to investigate AI's current and future social impacts and to plan responses. Perhaps making small changes to existing laws in response to AI's positive and negative affordances (Calo, 2017). Another method would be to allow the industry to form ethical codes (see Cooper, 2021) and police themselves. However, as one author notes, "History is replete with examples of new industries forming ethical codes of conduct, only to have those codes invalidated by the federal government ..." (Calo, 2017). Ethics is notoriously malleable and contested. The AI industry generally would likely prefer ethical standards over binding laws for the obvious reason that real penalties do not attach to disregarded ethical rules. That is, ethics lack hard enforcement mechanisms. Conversely, laws and regulations have a degree of finality, official policy, and enforceability (Young, Katell & Krafft, 2019).

Some literature suggests avoiding detailed regulations in favor of developing general principles, while other literature recommends developing programmatic approaches. In developing general principles, Petit (2018) suggests that the issues of accountability, responsibility, and transparency are paramount. According to Petit (2018), accountability refers to the need for AI systems to explain its decisions and actions to users. Responsibility refers to an individual's ability to answer for AI decisions, errors, or unexpected results. Here there should be a legal relationship between an algorithm's decision and the people creating the algorithm. Petit (2018) defines transparency as the ability to describe, inspect, and reproduce the mechanisms used by the AI system. Calo (2017) suggests that AI policy should address global issues such as justice, equity, safety, privacy, application of force, certification, taxation, power, and labor displacement. Still, others focus on governance and compliance issues such as licensing those that design and develop AI and certification of AI applications. Perhaps there should be an Federal Drug Administration for algorithms (Calo, 2017). Finally, others recommend that corporate and research governance frameworks be developed and the requirement that conflicts of interest be publicly disclosed (Schipper, 2020).

Of course, to pass regulations, lawmakers must know how to define AI. One useful definition of AI is offered by Russell and Novig (2002) divides AI along the dimensions of thinking versus acting and human-like versus rational. See diagram below:



(Source: Čerka, Grigienė & Sirbikytė, 2015).

Under Russell and Norvig's (2002) conception AI will either think like humans and act accordingly or reason correctly about the world given a set of tools and assumptions. It is suggested that such definitional clarity could help policymakers as they develop AI regulation (Krafft, Young, Katell, Huang & Bugingo, 2020). Others suggest that, in the end, what labels we use is less consequential so long as the AI regulation thoroughly explores the social channels and impacts, and the work is nuanced and rigorous (Young, Katell & Krafft, 2019).

Scherer (2015) believes that many of the problems of AI regulation are merely gaps in current law, and they can be filled within the existing legal and legislative systems without significant overhaul. Creating a definition of AI may be difficult but developing precise legal definitions for general terms is hardly new or challenging. Legal descriptions for assigning liability or developing regulation will likely either be over or under-inclusive, but this is not a legally unfamiliar problem for the courts. Similarly, the issues of

foreseeability and causation have always required court development whenever technology changes. AI should present no new challenge. Further, the issues surrounding manufacturing discreteness have long been addressed in the context of modern manufacturing. For example, automobiles use components developed by many different companies, and courts can adequately apportion liability in those cases. Tort liability for opaqueness can be limited by reducing liability in cases where companies make their systems more transparent. Transparency can also be legislated as a mandate or through incentives. Scherer (2015) does believe that the courts have advantages in fact finding and incrementalism but that their incentives might be misaligned to be relied upon exclusively. The courts exist within an adversarial process that might not optimize public welfare. Lawyers select cases not for their potential to optimize the reduction in social harm but rather to maximize the value of the monetary settlement. Thus Scherer (2015) considers the legislature as playing a key role in AI governance. Legislatures have the important characteristic of democratic legitimacy. However, they do suffer from a lack of expertise as it relates to emerging technologies. Legislatures can partially overcome this difficulty through hearings and gaining advice from lobbying groups and experts. A more efficacious option for the legislature is to delegate particularized rulemaking to either committees and subcommittees, or agencies. Agencies present a particularly good choice. Legislatures can establish generalized goals and assign detailed rulemaking to agencies. Agencies are in a good position to develop particularized rules because they are flexible and independent and can be staffed with technical experts able to conduct the level of detailed evaluation needed to draft socially maximizing policies (Scherer, 2015 and Pratley, 2015).

Specific Regulatory Proposals

There is a body of the literature that addresses specific proposals to particular AI related problems. Basic research will be a key element in developing AI. Still, due to the enormous cost of computing power and data acquisition needed to drive this research, it is likely only large profit-driven companies will possess the means. Therefore, governments must begin compelling data and computing resources

sharing with universities and smaller organizations to enhance and promote the needed research (Calo, 2017). The capacity of AI to recognize patterns in people's behaviors as expressed by available data threatens the boundary between what is public and what is private. The risk to individual privacy rights is great. Privacy laws need to be carefully reviewed and revamped to control this coming reality (Calo, 2017; Young, Katell & Krafft, 2019). Further to control for AI bias in such diverse areas as the criminal justice system and consumer products, particular attention must be paid to AI training data. Data must be certified to ensure that certain demographics are not unintentionally underrepresented or that throughput is not discriminatory (Calo, 2017). The threat from autonomous weapon systems has the potential to create an entirely new arms race. In the first incidence, there must be an international consensus on what counts as an autonomous weapon and the meaning of human control (Young, Katell & Krafft, 2019). AI displacement of labor, at least transitionally, is also a national concern. The social safety net should be thickened for this disruption. Consideration should be given to unconditional basic income, changing the progressive tax systems, distributing subsidies or vouchers, or shortening the maximum working hour laws (Wisskirchen et al., 2017). Robots that replace workers do not pay taxes. Perhaps they should (Weller, 2017). Policymakers should determine what harms physical and non-physical, and direct and indirect harm may arise for AI. Software certifications and programmer credential programs should be legislated to mitigate potential damages. Finally, regarding democracy and the electoral process, wide-ranging debate must be brought to bear to ensure the safeguarding of governmental institutions. Safeguarding institutions include protecting the electoral processes and the compliance of Big Tech corporations with electoral laws (Schippers, 2020).

Enacted and Proposed US Legislation

The remaining AI regulation literature provides a descriptive analysis of enacted and proposed legislation. The literature notes that despite the US position as a frontrunner in the innovation and commercialization of AI, it still lacks an overall federal AI strategy. However, it also notes that in the last

few years, the US federal government has been very active in coordinating and planning AI research and development (Lyon, Gaedt-Sheckter & Waldmann, 2020). Although most of the remaining literature is descriptive, generally, none of it is critical of the efforts or proposals developed so far (see Assibong, Wogu, Sholarin, Misra, Damasevičius & Sharma, 2020; Birnbaum, 2020; Chanthadavong, 2020; Engler, 2021; Gibson, 2020; Samp, 2020; Vought, 2020).

Conclusion

Notwithstanding the rather comprehensive coverage within the literature of many aspects of AI's challenges, regulatory proposals, and enacted and proposed legislation, no analysis has been done on what actors are bringing what regulations forward. That will be the next topic of this paper.

US Federal Laws and Regulations

Introduction

Aristotle said that man is a political animal. Man is always either consciously or unconsciously participating in politics (Assibong, Wogu, Sholarin, Misra, Damasevičius & Sharma, 2020). In the US, politics is generally conducted through three branches of government. Either the courts, executive, or legislature. To evaluate the potential motivations of these branches as it relates to AI regulation, each branch's current activity will be reviewed. The review of the court's role will be brief mainly because not much action has occurred within the courts that might be considered directly related to AI. The executive branch has had some recent activity relating to AI, but it has also been limited and only from the Obama and Trump administrations (i.e., between 2009 – 2021). Therefore, the review of the executive branch will also be brief. In 2019, the US legislature began to prioritize concerns over the development and regulation of AI (Lyon, Gaedt-Sheckter & Waldmann, 2020). This focus is likely due to

fears over US competitiveness, military readiness, and social unrest over the intrusive and biased use of AI technology. Therefore, this paper will focus on the activities of the legislature. Most of the major legislations will be categorized, discussed, and analyzed in terms of the prominent actors involved.

Courts

Most court rulings relating to AI have surrounded mundane matters of contracts (e.g., *Go2Net, Inc. v. CI Host, Inc.*, 2003) or patents (e.g., *Smart Systems Innovations v. Chicago Transit Auth.*, 2017; *Vehicle Intelligence and Safety V. Mercedes-Benz*, 2015). Warrantless electronic data gathering has also been an active area for the courts, especially phone record data (e.g., *American Civil Liberties Union v. Clapper*, 2015; *Commonwealth v. Augustine*, 2014; *United States v. United States Dist. Court for Eastern Dist. of Mich.*, 1972; *Klayman v. Obama*, 2013). Two cases relating to phone data surveillance have reached the US Supreme Court. The first was related to potential harm from international phone call surveillance (*Clapper v. Amnesty Intern. USA*, 2013). The other was related to cell phone data collection efforts (*Carpenter v. US*, 2018). Another case to reach the US Supreme Court pertained to a state's ability to centralize data collection of the names and addresses of all persons obtaining drug prescriptions that had both a legal and illegal market (*Whalen v. Roe*, 1977). Another, more famous case reaching the US Supreme Court related to the propriety of the police's installation of a Global-Positioning-System (GPS) tracking device on an automobile to follow the automobiles moments (*US v. Jones*, 2012). Perhaps the most direct AI case was heard by the Supreme Court of Wisconsin. In that case, the defendant claimed that their due process rights were violated by the state's use of an AI empowered Correctional Offender Management Profiling for Alternative Sanctions (COMPAS) software (*State v. Loomis*, 2016). In this case, the court upheld the state's use of the system. The rather meager and tangential nature of AI court cases does not come as a surprise. AI is still relatively new and has not yet generated a significant number of important controversies. Owing to the court's reactive nature, it simply has not had the opportunity to address AI issues.

Executive

Like the courts, the executive branch has also been meager in its AI related activity. However, owing to the potential proactive nature of the executive, it has been able to develop a few actions directly related to AI. In 2016 the Obama administration's National Science and Technology Council published a report entitled, "Preparing for the Future of Artificial Intelligence" (National Science and Technology Council, 2016). This report encouraged the development of AI technologies with few restrictions. The report suggested that any AI public safety regulation "should be informed by assessment of the aspects of risk that the addition of AI may reduce alongside the aspects of risk that it may increase" (p. 1). Risk, according to this document, was the principal reason for any form of AI regulation. In 2019, the Trump administration issued an executive order (EO) entitled "Maintaining American Leadership in Artificial Intelligence" (Exec. Order No. 13,859, 2019). This EO created the 'American AI Initiative', which was intended to spur the development and regulation of AI and solidify the US as a global leader in AI technology by directing federal agencies to prioritize investment in AI research and development (Lyon, Gaedt-Sheckter & Waldmann, 2020). Additionally, the EO tasked the Office of Management and Budget (OMB) with creating a roadmap for AI use in the public sector. The roadmap is due June 1, 2021. Presumably, the OMB roadmap will lead to a more informed process and standards for trustworthy AI usage by the federal government (Engler, 2021). The US executive branch's entry into AI regulation development might be considered tardy. However, it does appear directionally correct.

Legislation

Introduction

The only law to have been passed the US Congress relating to AI is the National Defense Authorization Act (NDAA), enacted in 2019 (John, S., 2019). This law established the National Security Commission on Artificial Intelligence to study advancements in AI and their application to national security issues

(Gibson, 2020). In addition to the NDAA, however, between 2019 and 2020, several US federal draft bills and resolutions address AI and its role in society. These laws, bills, and resolutions (hereafter referred to as “bills”) cluster around seven topics, namely, general competitiveness, privacy, bias, national security, electoral security, labor, and safety. See appendix for a listing of all bills.

Category	Bills and Resolutions by Congress			Total
	Congress #115 (Years: 2017-2018)	Congress #116 (Years: 2019-2020)	Congress #117 (Years: 2021-2022)	
General Competitiveness	2	11		13
Privacy		9	1	10
Bias		3		3
National Security	1	2		3
Labor		2		2
Safety		2		2
Electoral Integrity		2		2
Total	3	31	1	35

Source: Congress.gov

The rash of new proposed legislation appears to be in response to recent events and social movements. They demonstrate a willingness to regulate AI in contrast to promoting informal guidance and voluntary standards (Lyon, Gaedt-Sheckter & Waldmann, 2020). The below analyses will examine each of the defined bill categories, provide a brief description of the bills, and analyze the political party support involved in the bill development.

General Competitiveness

There have been 12 bills and 1 resolution introduced relating to general competitiveness, making it the largest category of bills. Of the 13, 4 were introduced in both the House of Representatives (H.R.) and the Senate (S.). The first bill introduced was the Future of Artificial Intelligence Act of 2017 (H.R. 4625, S. 2217). Both H.R. and S. bills were sponsored by Democrats. They direct the Secretary of

Commerce to establish a federal committee to investigate the development of AI technology. It took approximately another year and a half for a new AI bill in this category to be introduced. Shortly after President Trump's EO on AI, the Growing Artificial Intelligence Through Research ("GrAI TR") Act (H.R. 2202) was introduced. This bill aims to establish a coordinated federal initiative to accelerate AI development. The act proposes to invest \$1.6 billion over 10 years in AI research and development across the private sector, academia, and government agencies (Gibson, 2020). It was introduced by a Democrat and had no S. companion bill. After these initial bills, new ones started arriving within Congress every few months. The main themes of these later bills were to establish or direct agencies to promote AI development, provide educational and governmental resources toward AI initiatives, advance national strategies for AI competitiveness, and develop guidelines and standards within AI technology. The bills also addressed the perceived concerns from the potential for the US to fall behind other international competitors (e.g., China and Russia) in AI technology development (see, Birnbaum, 2020; Lyon, Gaedt-Sheckter & Waldmann; 2020; Gibson, 2020).

Of the 13 bills within this category, 9 (69%) originated in the H.R. and 4 (31%) in the S. In terms of parties, 9 (69%) were sponsored by Democrats and 4 (31%) by Republicans. Therefore, Democrats initially submitted most of the AI related actions for this category. However, of the total 88 sponsors and cosponsors, the support was more even, with 49 (56%) Democrats and 39 (44%) Republicans signing on to the bills.

Privacy

There were 10 bills introduced from 2019 to the present relating to privacy, making it the second largest category of bills introduced. None of the 10 bills appeared to have companion bills. The first bill was introduced on April 14, 2019, by Republican Senator Roy Blunt. The bill entitled "Commercial Facial Recognition Privacy Act of 2019 (S. 847)" provides restrictions on the use of facial recognition software.

The bill requires, among other items, that entities obtain affirmative consent before collecting facial-recognition data (Blunt, 2019). This bill was the forerunner of what appears to be an earnest attempt to regulate facial recognition software. Of the 10 bills introduced under this category, only 1 was unrelated to facial recognition. The facial recognition bills provided for such items as the prohibition of federal funding of facial recognition technology, disallowing the use of facial recognition in federally assisted rental units, and restricting the use by police of facial recognition software (see, Gibson, 2020, Lyon, Gaedt-Sheckter & Waldmann, 2020). The one privacy related bill not associated with facial recognition was the “Protecting Personal Health Data Act (S. 24).” This act addressed using AI collection of personal health information (Lyon, Gaedt-Sheckter & Waldmann, 2020).

Of the 10 bills within this category, 5 (50%) originated in the H.R. and 5 (50%) in the S. In terms of parties, 9 (90%) were sponsored by Democrats and 1 (10%) by Republicans. Therefore, Democrats submitted most of the AI related actions for this category. Additionally, of the total 273 sponsors and cosponsors, the support was again weighted toward the Democrats, with 270 (99%) Democrats and only 3 (1%) Republicans signing on to the bills.

Bias

Following the 23 bills on general competitiveness and privacy, the introduction of legislation declines rapidly. There were only 3 bills introduced from 2019 to the present relating to bias. Of those 3, 2 are companion bills. The companion bill is the Algorithmic Accountability Act of 2019 (H.R. 2231 and S. 1108), sponsored by US Senators Ron Wyden (D-OR) and Rep. Yvette D. Clarke (D-NY). While the legislative activity in this category is small, the impact could be significant as this bill represents perhaps the most aggressive foray into AI regulation currently proposed. The bill requires “... commercial entities to conduct assessments of high-risk systems that involve personal information or make automated decisions, such as systems that use artificial intelligence or machine learning.” The bill

defines high-risk systems as those “automated decision systems ... that (1) may contribute to inaccuracy, bias, or discrimination; or (2) facilitate decision-making about sensitive aspects of consumers' lives by evaluating consumers' behavior.” (Wyden, 2019). The bill then requires companies to fix flaws discovered. This bill hints at a major shift from allowing the AI industry to self-regulate to a more direct regulatory approach (see Brumfield, 2020, and Lyon, Gaedt-Sheckter & Waldmann, 2020). The third bill, known as the “Filter Bubble Transparency Act (S.2763),” would compel large-scale internet platforms to provide clear notice of the platform’s use of algorithms and allow consumers to opt-out (Lyon, Gaedt-Sheckter & Waldmann, 2020).

Of the 3 bills within this category, 1 (33%) originated in the H.R. and 2 (67%) in the S. In terms of parties, 2 (67%) were sponsored by Democrats and 1 (33%) by a Republican. Additionally, of the 39 sponsors and cosponsors, the support was weighted more heavily toward the Democrats, with 32 (92%) Democrats and only 7 (8%) Republicans signing on to the bills.

National Security

The only law to have been passed the US Congress relating to AI is the National Defense Authorization Act (H.R.5515), or NDAA, enacted in 2019. This law established the National Security Commission on Artificial Intelligence to study AI and its national security applications (John, 2019). In response, the Department of Defense created the Joint Artificial Intelligence Center, becoming the focal point for DoD AI initiatives (Gibson,2020). The act also created the National AI Initiative Office housed within the White House’s Office of Science and Technology Policy. The new office is charged with federal AI coordination. This new office may play an important role in AI governance, as it seems well-positioned to coordinate between federal agencies (Engler, 2021). To date, the NDAA is likely the closest thing to a US national AI strategy endorsed by Congress (Samp, 2020). The other two outstanding bills in this area, namely S. 3965 and H.R. 6395, generally shore up and make organizational modifications to the NDAA.

Given that there were only a few bills passed/proposed in this category and because national security is widely supported with many riders and amendments, little information can be obtained from an analysis of partisan support for AI within this category. Therefore, no attempt will be made to do so.

Labor

There are only 2 proposed bills in this category, and they are companion bills. The AI Jobs Act of 2019 (H.R. 827 and S. 1363) was introduced on January 28, 2019. It would authorize the Department of Labor to create a report studying the future impact of AI on American labor. This bill appears to acknowledge the danger proposed by AI to labor, however, there is no indication of what the government might offer in terms of labor protection (Lyon, Gaedt-Sheckter & Waldmann, 2020).

As there are 2 bills and they are companion bills, the H.R. versus S. support is 50/50. In terms of parties, both bills were sponsored by Democrats. Of the total 23 sponsors and cosponsors, the support was weighted more heavily toward the Democrats, with 15 (65%) Democrats and only 8 (35%) Republicans signing on to the bills.

Safety

Within this category, there has been one House Resolution, namely Supporting the Development of Guidelines for Ethical Development of Artificial Intelligence (H.R. Res. 153), and 1 proposed bill, namely, Consumer Safety Technology Act (H.R. 8128). The resolution supports the development of guidelines for the ethical development of AI through the engagement of industry, government, academia, and civil society (Lawrence, 2019). The bill, if enacted, does not aim to regulate AI directly but rather authorizes the U.S. Consumer Product Safety Commission to establish a pilot program to explore the use of AI for purposes of protecting consumer safety (Gibson, 2020).

Democrats introduced both the resolution and the bill, and both were introduced in the H.R. Of the total 16 sponsors and cosponsors all (100%) were Democrats.

Electoral Integrity

There are only 2 proposed bills in this category, and they are companion bills. The Bot Disclosure and Accountability Act (H.R. 4536 and S. 2125) was first introduced on June 25, 2018 and reintroduced on July 16, 2019. The bill mandates that the Federal Trade Commission develop regulations to require digital platforms to disclose their use of automated software designed to replicate online human actions. Importantly, it also prohibits political candidates from using these programs to share or disseminate political election information (Lyon, Gaedt-Sheckter & Waldmann, 2020).

Democrats introduced both bills. Of the total 6 sponsors and cosponsors, 5 (83%) are Democrats, and 1 (17%) was a Republican.

Conclusion

From this section, it is evident that the implications of AI have not yet reached the courts in a tangible way and that the executive branch just starting to develop its position concerning AI. The executive branch seems to recognize the importance of AI in a bipartisan manner as both a Democratic and a Republican took some actions to communicate positions toward AI. From these positions, it might be possible to infer that the Democratic position was more cautious in focusing on risk assessment than the Republican position, which seemed more directed toward encouraging AI advancement and US global leadership.

Some might suggest that the legislative branch was slow to start on AI regulation; however, within the last three years, such criticism would no longer be valid. As noted above and below, 35 bills have been developed within the last three Congresses.

Type	Bills and Resolutions Sponsors								
	Democrat			Republican					Grand Total
	House of Representatives	Senate	Total	House of Representatives	Senate	Total	House of Representatives	Senate	
General Competitiveness	6	3	9	3	1	4	9	4	13
Privacy	5	4	9		1	1	5	5	10
Bias	1	1	2		1	1	1	2	3
National Security	1	1	2	1		1	2	1	3
Labor	1	1	2				1	1	2
Safety	2		2				2	0	2
Electoral Integrity	1	1	2				1	1	2
Grand Total	17	11	28	4	3	7	21	14	35

Source: Congress.gov

As demonstrated in the table, most of the activity is being generated from Democrats, with 28 (80%) of 35 sponsorships originating from the Democratic party and only 7 (20%) from the Republican party. The initiating chambers seem relatively more even, with 21 (17 Democrat plus 4 Republican) or 60% originating in the H.R. and 14 (11 Democrat plus 3 Republican) or 40% originating in the S.

As the below table demonstrates, both sponsor's and cosponsors' overall support seems to be also weighted toward the Democratic Party.

Type	Bills and Resolutions Sponsors and Cosponsors								
	Democrat			Republican					Grand Total
	House of Representatives	Senate	Total	House of Representatives	Senate	Total	House of Representatives	Senate	
General Competitiveness	35	14	49	33	6	39	68	20	88
Privacy	262	8	270		3	3	262	11	273
Bias	32	4	36		3	3	32	7	39
National Security	2	1	3	2	1	3	4	2	6
Labor	11	4	15	6	2	8	17	6	23
Safety	13		13	3		3	16	0	16
Electoral Integrity	5	1	6				5	1	6
Grand Total	360	32	392	44	15	59	404	47	451

Source: Congress.gov

Here, overall support fell heavily toward the Democrat Party, with 360 (87%) of 451 supporting congressional members being Democrats and only 59 (13%) Republicans.

The covid-19 pandemic and the 2020 elections likely shifted the federal executive and lawmakers' focus from legislative activity. However, there still was an impressive level of AI related activity. While several bills are contradictory, at odds with each other, or limited in their impact, the US federal government does appear to have begun to bolster its efforts to encourage AI development in a responsible way (Lyon, Gaedt-Sheckter & Waldmann, 2020).

Appendix

Classification	Congress	Description	#	Member Name [Party-State-District]	Date Sponsorship
General Competitiveness	115	FUTURE of Artificial Intelligence Act of 2017	S. 2217	Sen. Cantwell, Maria [D-WA]	12/12/2017
General Competitiveness	115	FUTURE of Artificial Intelligence Act of 2017	H.R.4625	Rep. Delaney, John K. [D-MD-6]	12/12/2017
General Competitiveness	116	Growing Artificial Intelligence Through Research ("GrAIR") Act	H.R.2202	Rep. Lipinski, Daniel [D-IL-3]	4/10/2019
General Competitiveness	116	AI in Government Act of 2019	S.1363	Sen. Schatz, Brian [D-HI]	5/8/2019
General Competitiveness	116	AI in Government Act of 2020	H.R.2575	Rep. McNerney, Jerry [D-CA-9]	5/8/2019
General Competitiveness	116	AI-IA (Artificial Intelligence Initiative Act)	S.1558	Sen. Heinrich, Martin [D-NM]	5/21/2019
General Competitiveness	116	National Artificial Intelligence Initiative Act of 2020	H.R.6216	Rep. Johnson, Eddie Bernice [D-TX-30]	3/12/2020
General Competitiveness	116	GAINS Act (Generating Artificial Intelligence Networking Security Act)	H.R.6950	Rep. McMorris Rodgers, Cathy [R-WA-5]	5/19/2020
General Competitiveness	116	National AI Research Resource Task Force Act of 2020	H.R.7096	Rep. Eshoo, Anna G. [D-CA-18]	6/4/2020
General Competitiveness	116	National AI Research Resource Task Force Act of 2020	S.3890	Sen. Portman, Rob [R-OH]	6/4/2020
General Competitiveness	116	Artificial Intelligence Education Act	H.R. 8390	Rep. Tonko, Paul [D-NY-20]	9/24/2020
General Competitiveness	116	Expressing the sense of the House of Representatives with respect to the principles that should guide the national artificial intelligence strategy of the United States	H.Res.1250	Rep. Hurd, Will [R-TX-23]	12/4/2020
General Competitiveness	116	Securing American Leadership in Science and Technology Act of 2020	H.R.5685	Rep. Lucas, Frank D. [R-OK-3]	1/28/2020
Privacy	116	Commercial Facial Recognition Privacy Act of 2019	S.847	Sen. Blunt, Roy [R-MO]	3/14/2019
Privacy	116	Facial Recognition Bill	H.R.3875	Rep. Tlaib, Rashida [D-MI-13]	7/22/2019
Privacy	116	FACE Protection Act of 2019	H.R.4021	Rep. Engel, Eliot L. [D-NY-16]	7/25/2019
Privacy	116	No Biometric Barriers to Housing Act of 2019	H.R.4008	Rep. Clarke, Yvette D. [D-NY-9]	7/25/2019
Privacy	116	Ethical Use of Facial Recognition Act	S.3284	Sen. Merkley, Jeff [D-OR]	2/12/2020
Privacy	116	Exposure Notification Privacy Act	S.3861	Sen. Cantwell, Maria [D-WA]	6/1/2020
Privacy	116	George Floyd Justice in Policing Act of 2020	H.R.7120	Rep. Bass, Karen [D-CA-37]	6/8/2020
Privacy	116	Federal Police Camera and Accountability Act of 2019	H.R.3364	Del. Norton, Eleanor Holmes [D-DC-At Large]	6/19/2020
Privacy	116	Police CAMERA Act of 2020	S.4962	Sen. Schatz, Brian [D-HI]	12/3/2020
Privacy	117	Protecting Personal Health Data Act	S.24	Sen. Klobuchar, Amy [D-MN]	1/22/2021
Bias	116	Algorithmic Accountability Act of 2019	S.1108	Sen. Wyden, Ron [D-OR]	4/10/2019
Bias	116	Algorithmic Accountability Act of 2019	H.R.2231	Rep. Clarke, Yvette D. [D-NY-9]	4/10/2019
Bias	116	Filter Bubble Transparency Act	S.2763	Sen. Thune, John [R-SD]	10/31/2019
National Security	115	John S. McCain National Defense Authorization Act for Fiscal Year 2019	H.R.5515	Rep. Thornberry, Mac [R-TX-13]	4/13/2020
National Security	116	Artificial Intelligence for the Armed Forces Act of 2020	S.3965	Sen. Heinrich, Martin [D-NM]	6/16/2020
National Security	116	National Defense Authorization Act for Fiscal Year 2021	H.R.6395	Rep. Smith, Adam [D-WA-9]	3/26/2021
Labor	116	AI JOBS Act of 2019	H.R.827	Rep. Soto, Darren [D-FL-9]	1/28/2019
Labor	116	AI JOBS Act of 2019	S.1363	Sen. Schatz, Brian [D-HI]	5/8/2019
Safety	116	Supporting the development of guidelines for ethical development of artificial intelligence	H.Res.153	Rep. Lawrence, Brenda L. [D-MI-14]	2/27/2019
Safety	116	Consumer Safety Technology Act	H.R.8128	Rep. McNerney, Jerry [D-CA-9]	8/28/2020
Electoral Integrity	116	Bot Disclosure and Accountability Act of 2019	S.2125	Sen. Feinstein, Dianne [D-CA]	7/16/2019
Electoral Integrity	116	Bot Disclosure and Accountability Act of 2019	H.R.4536	Rep. Slotkin, Elissa [D-MI-8]	9/26/2019

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