Comparative Global AI Regulation: Policy Perspectives from the EU, China, and the US

Jon Chun[1]
Christian Schroeder de Witt[2]
Katherine Elkins[1]

[1]Kenyon College
[2]Oxford University

October 2024

1 Abstract

As a powerful and rapidly advancing dual-use technology, AI offers both immense benefits and worrisome risks. In response, governing bodies around the world are developing a range of regulatory AI laws and policies. This paper compares three distinct approaches taken by the EU, China and the US. Within the US, we explore AI regulation at both the federal and state level, with a focus on California's pending Senate Bill 1047. Each regulatory system reflects distinct cultural, political and economic perspectives. Each also highlights differing regional perspectives on regulatory risk-benefit tradeoffs, with divergent judgments on the balance between safety versus innovation and cooperation versus competition. Finally, differences between regulatory frameworks reflect contrastive stances in regards to trust in centralized authority versus trust in a more decentralized free market of self-interested stakeholders. Taken together, these varied approaches to AI innovation and regulation influence each other, the broader international community, and the future of AI regulation.

2 Introduction

Proposed in April 2021 and agreed upon by December, the EU Act was the first major coordinated effort to regulate AI; it came into force in August 2024. The Biden administration published its Blueprint for an AI Bill of Rights in October 2022. It spoke to the need to protect citizen's privacy and freedom from algorithmic discrimination. The following month, on November 25th, several Chinese government ministries jointly released regulations on AI-generated deepfakes. The US Whitehouse Executive Order #14110 "Safe, Secure, and

Trustworthy Development and Use of Artificial Intelligence" was issued in October 2023. In February 2024, California State Senator Scott Wiener introduced what was arguably the strictest AI regulation with the "SB-1047 Safe and Secure Innovation for Frontier Artificial Intelligence Models Act". After ten major revisions across both the California Senate and Assembly, the bill passed on September 3rd and now faces an uncertain future as it awaits Governor Newson's signature to become law.

Underlying these varied global efforts are common concerns over the expected social, economic, and geopolitical impacts of AI. The European Union has taken a proactive stance with regard to social effects of AI, implementing stringent regulations aimed at fostering competitiveness while prioritizing ethical considerations, enhancing privacy protections, and mitigating potential harms. China has focused on aligning AI development with "core socialist values" while also addressing issues of transparency and workers' rights. The United States, meanwhile, has grappled with concerns about AI-generated disinformation, election integrity, and the role of content recommendation systems in social media, particularly in light of events such as the 2020 elections and the rise of platforms like TikTok [Smit et al., 2022].

Beyond the societal effects, there is universal acknowledgement of the centrality of AI to related technologies like advanced chips, energy production and storage, 5G/6G telecommunications, satellites, and robotics. These illustrate the importance of AI to national economics, competitiveness, and security. Some argue that the EU's stricter AI regulation may inadvertently stifle innovation, deter investment, and weaken Europe's position in the global AI and technology race [Suominen, 2020]. The tension between regulatory safety and competitiveness is particularly evident in the dynamics between China and the US, with both nations striving to balance innovation with responsible AI development [Information Technology and Innovation Foundation (ITIF), 2024].

Still, there are efforts to transcend national policies and competitions to develop a global harmonization of AI regulation. AI automation threatens widespread job displacement, exacerbates inequality and accelerates the need to transition to a rapidly-evolving job market [The White House, 2024a]. In September 2024, the United Nations' AI Adivsory Body released a report highlighting key areas of concern that transcend national boundaries. These include pervasive latent biases, emergence of surveillance states, and AI generated disinformation [UN AI Advisory Body, 2024]. Additionally, serious legal, security, and humanitarian issues–particularly related to autonomous weapons and public security–underscore the importance of international cooperation. As AI continues to evolve, the global community faces the complex task of developing regulatory frameworks that can effectively address these multifaceted challenges while fostering innovation and ensuring equitable benefits across nations.

3 AI Governance

This section describes the emerging AI regulatory frameworks in the EU, China, and the US at both federal and state levels. In particular, it contrasts the top-down, risk-based approach of the EU AI Act with the more market-driven approach of the US. The latter emphasizes coordinating existing legal, regulatory, and enforcement entities from the federal level down to states and cities. In between is the Chinese approach, which has the appearance of centralized regulatory control, but in practice emphasizes decentralized innovation, regional competition, and economic development at the local levels.

While the EU and China appear to have relatively stable AI regulatory frameworks, there is a growing debate in the US about the future direction of AI regulation. The Biden Executive Order #14110 on "Safe, Secure, and Transparent Development and Use of AI" coordinates over 100 specific tasks both within and between over 50 federal entities in a decentralized way that largely augments existing regulatory laws and agencies. However a number of US Congressional committees, proposals, and influential public/corporate interest groups are lobbying for a new AI regulatory structure that is more centralized, restrictive, and punitive than EO #14110. Some even promote centralized registration of models, proofs of AI safety, and criminal penalties [LegiScan, 2024, Schumer, 2023].

4 The European Union

4.1 Overview

The 2024 EU AI Act is positioned as the world's first comprehensive AI law [European Union, 2024]. Just as prior European general purpose legislation, such as the 2016 General Data Protection Regulation (GDPR) [European Union, 2016], the EU AI Act represents complex joint efforts and interests across various EU bodies, including the European Commission, the European Parliament and the European Council, where the latter represents the Heads of State of all EU member countries. Influence on the Act's formation was also taken publicly by national government officials, such as France's premier Macron's overt lobbying for exemptions for open source AI providers such as Mistral [Abboud and Espinoza, 2023], as well as, both publicly and covertly, by lobbying and industry groups, including Big Tech [Perrigo, 2023], and German pro open-source non-profit LAION [LAION, 2023].

Uniquely, the Act was first constructed within a product safety framework, but then blended with a fundamental rights agenda at the behest of the European Parliament and against pressure by the European Commission [The Privacy Advisor Podcast, 2024]. This approach resulted in a unique and novel blend of legislative frameworks, clearly setting the EU AI Act apart from prior legislation building on established frameworks such as the GDPR. As Dragos Tudorache, a member of the European Parliament from Romania and the chair

of the Special Committee on Artificial Intelligence in a Digital Age, remarked: "Regulation isn't just rules, it's an opportunity to express our values [Tyrangiel, 2024]."

While constituting an innovative syncretism at heart, the Act does follow and respect earlier European generalist regulatory initiatives, such as the GDPR, and the 2012 Digital Markets Act [Parliament and of the European Union, 2022, DMA]. In fact, the EU started examining the compatibility of the GDPR and AI as early as in 2020 [Sartor and Lagioia, 2020]. Nevertheless, the release of ChatGPT in November 2022 and its rapid adoption by millions of consumers worldwide caught European policymakers off-guard and led to significant adjustments to the Act's handling of AI governance. On December 9th, 2023, the Act was provisionally agreed between the European Parliament and the European Council. During the 3-day round of negotiations, the Act's scope was tightened [Consilium, 2023]. It was clarified that the Act does not apply outside of European law, does not infringe on the security competences of the member states or so-entrusted entities, nor any military or defense applications. Importantly, it was clarified that the Act would not apply to sole purposes of research and innovation, nor other non-professional use. Most importantly, the Act's traditional approach to AI systems risk classification was complemented by the notion of general-purpose AI systems (GPAI) [European Union, 2024, Article 3(63)], resulting in a parallel governance track for such AI systems. Despite open questions, the Act's ambition to distinguish between GPAI and non-GPAI systems, and GPAI systems of *systemic risk*, is similarly unique among AI regulations globally.

4.2   The Geopolitics of the Act

Besides regulating the EU single market, the Act is widely regarded as a strategic effort by the European Commission to establish themselves as the leading AI rulemakers globally [Chatham House, 2024]. Just as after the adoption of the GDPR in 2016 [European Union, 2016], it is speculated that companies across the world will begin to prioritize compliance with European AI law out of economic necessity, not through coercion [Almada and Radu, 2024]. In the case of the GDPR, this form of "Brussels Effect" [Bradford, 2020] was complemented by a "de jure" effect in which countries with a lack of their own regulatory capacity, such as many developing countries, incorporated EU laws instead. For example, the Philippines incorporated the right to be forgotten into their Data Privacy Act of 2012 [of the Philippines, 2012, Linklaters, 2024]. In a similar way, it is speculated that the EU AI Act may similarly become the de-facto standard for AI governance in much of the Western and developing world [Almada and Radu, 2024].

One direct institutional consequence of the EU AI Act is the establishment of a novel authority under the helm of the European Commission, namely the EU AI Office. This new office will not only oversee AI regulation and AI systems' compliance, provide a central pool of AI expertise to the EU's member states, but also provides a "strategic, coherent, and effective European approach on AI
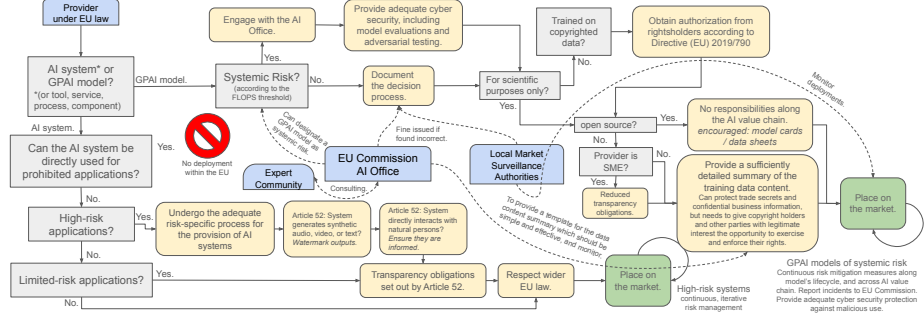
Figure 1: Decision tree for providers of (GP)AI systems and GPAI models on the way to the EU market.

at the international level" [European Commission, 2024]. A specialist position, The Advisor for International Affairs, will represent the AI Office in "global conversations on convergence toward common approaches" [EU AI Act, 2024]. The EU AI Office therefore is not only meant to consolidate the EU's approach to AI regulation within the European market, but will likely centrally support the EU's foreign policy ambitions in economic and trade negotiations.

4.3 Laws and Regulation

The Act is designed as an *adaptive legislation*, meaning that many details are intentionally left vague to permit later adaptation as technology changes. At its core lies a risk classification system that puts obligations mostly on the developers ("providers") of AI systems. Importantly, the Act not only applies to systems that are placed on the market or put into service in the EU, but also to AI systems whose output is used in the EU. The use of AI systems for national security, research, or recreational purposes, as well as, more generally, end-users of AI systems are excluded from regulation under the Act.

4.3.1 Systems and Models

The AI Act adopts the definition of *AI system* from the OECD's AI Principles, defining an AI system as *"a machine-based system that is designed to operate with varying levels of autonomy and that can, for explicit or implicit objectives, generate outputs such as predictions, recommendations, or decisions that influence physical or virtual environments"* [OECD, 2019]. *AI models*, conversely, are mathematical algorithms or trained models that, in isolation, lack additional components such as a user interface or hardware integration that would allow them to be used as an AI system.

Among models, the Act further disambiguates between non-GPAI and *general-purpose AI (GPAI) models*, with the latter defined as *"an AI model,*

*including where such an AI model is trained with a large amount of data us-
ing self-supervision at scale, that displays significant generality and is capable
of competently performing a wide range of distinct tasks regardless of the way
the model is placed on the market and that can be integrated into a variety of
downstream systems or applications, except AI models that are used for research,
development or prototyping activities before they are placed on the market"* [Eu-
ropean Union, 2024, Article 3(63)]. Where a GPAI model is integrated into an
AI system, the system is referred to as a *GPAI system* provided that the system
has the capability to serve a variety of purposes.

4.3.2 Roles

The Act fundamentally distinguishes between the roles of *provider*, *deployer*,
importer and *distributor*. Providers are those *"placing on the market or putting
into service AI systems or placing on the market general-purpose AI models
in the Union"* [European Union, 2024, Article 2], irrespectively of their loca-
tion. They have pre-market obligations including an initial risk assessment,
risk-specific compliance, as well as risk-specific post-market obligations. De-
ployers are users of AI systems that are based on the EU and that don't fall
within a small number of non-professional use cases. The Act furthermore dis-
tinguishes between AI models or systems provided or deployed from within the
EU, and those from outside.

4.4 Risks

At the core of the EU AI Act lies a risk classification system for AI systems
based on their possible "direct" use cases. In the case of GPAI systems, the
degree of "directness" is understood as the extent to which implemented safety
measures can prevent risk-relevant use by deployers. If local market surveillance
believe that a GPAI systems can be (or become) "directly" used for high-risk
activities the EU AI Office will carry out the corresponding compliance proce-
dures [European Union, 2024].

Prohibited use cases. Integrating fundamental human rights into the prod-
uct safety framework, the Act defines a class of *prohibited AI practices*, such
as placing on the market AI systems that can be used for certain forms of
manipulation and exploitation, social scoring purposes, and certain biometric
identification purposes. Furthermore, the deployment of AI systems that leave
the user uninformed about their interaction with an AI system, emotion recog-
nition systems or biometric categorisation systems, or AI systems producing
deepfakes are all likewise prohibited [European Union, 2024, Article 5].

High-risk use. The class of *high risk* systems constitutes the majority of risk-
related regulation [European Union, 2024, Article 6]. High-risk systems include
a wide variety of systems as defined in [European Union, 2024, Annex I-III],
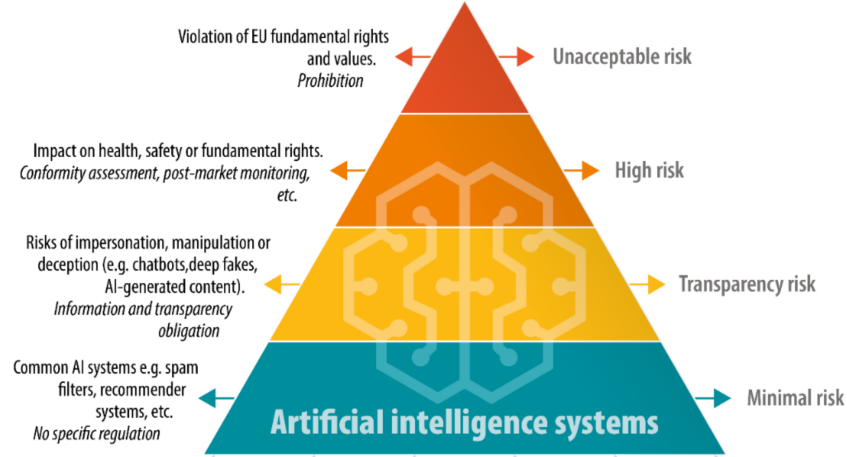
Figure 2: The risk pyramid for AI systems (taken from [Madiega, 2024])

including systems meant to serve as safety systems for other AI systems. According to [European Union, 2024, Article 28(2a)], providers of high risk systems are subject to compliance obligations, including the establishment of risk and quality management systems, data governance, human oversight, cybersecurity measures, postmarket monitoring, and maintenance of the required technical documentation. Owing to the Act's adaptive nature, it is expected that these obligations will be further detailed in later, sector-specific regulation.

Limited risk. Chatbots or AI systems that generate content or aid in decision-making without any critical safety aspects or significance are deemed of *limited risk*, although the Act only indirectly defines this class [European Union, 2024, Recital 32a]. These systems are merely subject to transparency obligations, including end-users of such systems must be informed that they are interacting with AI.

Minimal risk. AI systems that pose little to no risk to users' rights, health, or safety are left unregulated by the Act, although other obligations under EU law still apply. These systems are sometimes referred to as *minimal risk* although this term is not used in the Act.

Importantly, in the case of GPAI models, a special risk category is defined for the standalone model even before having been integrated into an AI system.

GPAI models of systemic risk. The Act imposes particular regulation on providers of general-purpose AI models of systemic risk [European Union, 2024, Article D], which it defines to be all models for which *"the cumulative amount of compute used for its training measured in floating point operations (FLOPs) is greater than 10^{25}"* [European Union, 2024]. The limit of 10^{25} was reportedly

reached as a middle ground between 10^{24} and 10^{26} demanded by two opposing factions, the European Parliament, and the European Commission [European Union, 2024, Chapter II(8)][The Privacy Advisor Podcast, 2024]. Providers of GPAI need to register their model with the European Commission, and need to adhere to a wide-ranging catalogue of safety and security criteria. Owing to its adaptive nature, the Act purposefully leaves various technical criteria related to systemic risk classifications open for later adjustment to account for the unpredictability of technological progress.

4.5 Innovation and Open Source

The Act contains several measures intended to harness the economic and societal benefits of open-source AI software [Eiras et al., 2024a,b]. The Act defines free and open-source AI components to cover "the software and data, including models and general-purpose AI models, tools, services or processes of an AI system" and explicitly states that provision of such models on open repositories should not seen as a form of monetization [European Union, 2024, Recital 103].

The EU Act contains wide-ranging exemptions for providers of certain AI systems provided under free and open source software licenses [European Union, 2024, Article 53-54]. To be exempt, the systems may not contain GPAI models that fall within the systemic risk category, or otherwise exhibit unacceptable behavior. The Act distinguishes the above from providers of pre-trained AI models that are made accessible to the public under a license that allows for the access, usage, modification, and distribution of the model, and whose parameters, including the weights, the information on the model architecture, and the information on model usage, are made publicly available. It is to be noted that the term open source model is not used explicitly and the degree of legal overlap with open source software is not immediately clear, and hence such models might be referred to rather as open models. Open models are not exempt from Article [European Union, 2024, C(1)(c)-(d)], as well as [European Union, 2024, Article D] and [European Union, 2024, Article 28(2a)], the latter governing third-party obligations "along the AI value chain of providers, distributors, importers, deployers or other third parties" [Sartor and Lagioia, 2020] for high-risk AI systems.

Under any circumstances, providers of open GPAI model providers are responsible for transparency obligations according to [European Union, 2024, Article C(1)(c)-(d)]. These transparency requirements include respecting existing Union copyright law [European Union, 2024, Article C(1)(c)] according to Article 4(3) of the Digital Single Market Directive (EU) 2019/790 [European Union, 2019], and the need to make a *"sufficiently detailed summary of the content used for training of the general-purpose AI model"* [European Union, 2024, Article C(1)(d)]. The consequences of these transparency requirements for open GPAI model providers have been examined in [Warso et al., 2024]. Importantly, Directive (EU) 2019/790 expands GDPR regulation to copyright owners who share content online, meaning that key GDPR rights, such as the right to opt out [Eu-

ropean Union, 2016, GDPR Article 7] would require that copyright owners could ask for their data to be removed from open GPAI model training data.

As a further measure to stimulate innovation, member states can establish a regulatory sandbox, i.e. a controlled environment that facilitates the development, testing and validation of innovative AI systems (for a limited period of time) before they are put on the market [Madiega, 2024].

5 China

5.1 Overview

China's approach to AI governance and regulation is a hybrid between the centralized, top-down approach of the EU and the decentralized, free-market of competing interests in the US. Like the EU, China emphasizes safety, individual protections, and social harmony through top-down guidance, regulation, and enforcement [Zhang, 2022]. Like the US, China also emphasizes bottom-up innovation and economic development through a mix of decentralized provincial control alongside very competitive local markets. This hybrid approach seeks to optimize the benefits from both the EU and US models. The EU AI Act takes a coherent, universal risk-based approach, but the abstract and ambiguous language belies the hard work of grappling with real-world details in applying these general rules to disparate, complex and highly situational cases. Conversely, a fragmented, sector-specific approach like the US EO #14110 lacks coherent high-level simplicity, but benefits from experienced domain experts translating goals into more clear, immediate, and effective enforcement. China seeks to benefit from the coherence of the EU AI Act and the practical benefits of the US approach, which promotes innovation and economic competitiveness.

5.2 Laws and Regulations

China has advanced some of the first AI laws and regulations at the national level, which are summarized in Table 2. Unlike the horizontal risk-based approach of the EU, China has favored the sector-specific US approach of laws tailored to specific use-cases. These specific use-cases range from data privacy (November 2021) to recommendation algorithms (March 2022) to generative AI (January & August 2023). Despite appearances of centralized government control, Chinese AI regulations are the product of an iterative process involving diverse stakeholders that include mid-level bureaucrats, academics, corporations, startups, and think tanks [Sheehan, 2024]. The central government relies upon a pipeline of these experts to formulate, clarify, and interpret the details, while local officials mainly concern themselves with ensuring goals and outcomes are aligned with Chinese and socialist ideology [Zhang, 2022]. Both China's State Council and the Chinese Academy of Social Sciences have announced intentions of working towards a more holistic National AI law, although the outcome is uncertain [Webster et al., 2023].

Date	Title	Issuing Body	Description
June 1, 2017	Cybersecurity Law	National People's Congress	Establishes legal frameworks for cybersecurity, including data protection and network security, which indirectly impact AI development and deployment.
September 1, 2021	Data Security Law	National People's Congress	Provides regulations on data processing and security, affecting AI systems that process large amounts of data.
November 1, 2021	Personal Information Protection Law (PIPL)	National People's Congress	China's comprehensive data privacy law that governs the collection, storage, use, and transfer of personal information, impacting AI systems that handle personal data.
March 1, 2022	Algorithm Recommendation Regulation	Cyberspace Administration of China (CAC)	Regulates algorithms used for content recommendations, requiring transparency and fairness, and prohibiting practices that disrupt public order.
January 10, 2023	Provisions on Management of Deep Synthesis in Internet Information Service (Deep Synthesis Regulation)	CAC	Governs generative AI technologies, focusing on the authenticity and traceability of AI-generated content to prevent misinformation.
August 15, 2023	Interim Measures for the Management of Generative Artificial Intelligence Services (Generative AI Measures)	CAC and six other authorities	Targets generative AI services, imposing obligations on service providers to ensure legality, fairness, and cybersecurity of AI-generated content.
October 1, 2022 (Shanghai) November 1, 2022 (Shenzhen)	AI Industry Promotion Regulations in Shanghai and Shenzhen	Shanghai and Shenzhen Municipal Governments	Local regulations to promote AI development, including ethical oversight and support for innovation within the AI industry.
Expected in 2024/2025	Draft Artificial Intelligence Law (AI Law)	State Council (drafting stage)	A comprehensive national AI law is being drafted, aiming to provide an overarching legal framework for AI governance in China.

Figure 3: Chinese AI Laws and Regulations

5.3 Registration

On paper, China has perhaps the most onerous AI regulation requirements of the three regions considered. Table 3 lists the three major steps for deploying advanced AI models (for example, Baidu's LLM ERNIE) in order to be in compliance with regulatory laws (see Figure 4). These include model registration, rules for data management, and provisions for ongoing monitoring for compliance. The registration process alone illustrates how strict central regulation can slow down innovation and economic growth. As of March 2024, only 546 AI models have been registered, and just seventy are Large Language Models [China Money Network, 2024]. This number is in stark contrast to the countless commercial models, variants, and over 500,000 open-source LLMs on Huggingface.co [Huggingface.co, 2024], which is banned in China [ChinaTalk, 2023].

5.4 Compliance and Industrial Policy

In 2015, China announced a national strategic plan and industrial policy called "Made In China 2025" or MIC2025 integrated with their 13th (2016-2020) and 14th (2021-2025) Five Year Plan [The State Council of the People's Republic of China, 2015]. MIC2025 directs strong government support for innovation and high-end manufacturing to help make China a global leader in cutting-edge technologies like AI by 2025 [Congressional Research Service, 2019]. Part of this plan calls for supporting 10,000 "Little Giants," the small and mid-sized enterprises (SME) recognized as a key source of innovation [Global Times, 2021]. Although large "National Champions" like Baidu, Tencent, and Alibaba are expected to fully comply with AI regulations because of their dominant influence, the Little Giants are informally afforded leeway in order to avoid heavy regulatory burdens that could stifle innovation [Zhang, 2024].

What this means from a practical standpoint is that despite such rigorous guidelines, enforcement in China is relatively lax. Startups and SMEs fly under the radar as long as they do not have a large public presence [Zhang, 2022]. This approach allows for the promotion of innovation, economic growth, and international competitiveness [Yang, 2024].

China's hybrid system of AI regulation and selective enforcement attempts to combine the strengths of both the EU and the US approaches. While regulatory guidance is generally light, top-level enforcement usually comes into play when destabilizing patterns arise. This reactive enforcement can cause transitory market disruptions and lead to strict and sometimes surprisingly punitive measures to reign in excesses and outcomes at odds with CCP values like "common prosperity" [Caixin Global, 2021]. This pattern of regulatory crackdown is visible in other sectors from real estate[Bloomberg News, 2021] to education [Intresse, 2024]. Harsh penalties were levied by regulators between 2020-2022 to try to control excessive inequality and check the rise of powerful tech (Alibaba) and financial (Ant Group) corporations that could challenge government authority [Chen and Liu, 2023]. Although deflating the real estate bubble significantly

Model Registration	
Approval Process	AI Models, especially Generative and LLM, must undergo through review for compliance with regulatory standards by the CAC and other bodies
Public Use/Licensing	After approval, all models must be registered for public use
Sector-Specific Approvals	Approval by additional sector-specific regulatory bodies may be required (e.g. healthcare, finance, security)
Data Management	
Source and Legitimacy	All training data must come from legitimate and lawful sources and be accurately labeled and documented to ensure traceability and accountability
Privacy Protection	All companies must comply with China's privacy laws (e.g. PIPL) and aimplement robust measures to protect personal data and prevent misuse
Content Verification and Censorship	Providers must ensure training data does not contain prohibited data like politically sensitive or controversial content that could disrupt public order or national security (often requires moderation tools and manual checks)
Foreign-Language Content	Training data must include foreign language content to enhance global competitiveness
Compliance Obligations	
Security Assessment	Before launch, mandatory comprehensive security assessments to identify potential risks and vulnerabilities
Algorithm Registration	Registration of all algorithms including details on their design, functionality, and impacts on users and society
Ethical/Legal Compliance	Audit for compliance with ethical and legal standards, especially in avoiding inaccuracies, discrimination, and the perpetuation of biases against individual or groups
Ongoing Monitoring and Reporting	Continuous monitoring for system errors or deviations from approved conditions of use to allow for timely corrections

Figure 4: AI Model Compliance Steps in China

reduced household wealth tied to property speculation, the IMF shows China leads the world's largest economies with a 5.2% GDP growth [International Monetary Fund, 2024]. Some of this success is attributed to China's strategic industrial policy with its flexible regulatory framework.

6 United States

6.1 Overview

On October 30, 2023 US President Biden signed an executive order (EO #14110) on the "Safe,Secure,and Trustworthy Development and Use of Artificial Intelligence" [The White House, 2023b]. This act moved beyond the voluntary commitments secured in July 2023 [The White House, 2023a] and the October 2022 AI Bill of Rights [The White House, 2022]. EO #14110 represents the most comprehensive form of AI regulation in the United States to that date. It directly delegates AI responsibilities to over 50 existing federal regulatory agencies and other bodies with over 100 specific tasks designed to:

- Build out the capacity to address emerging concerns around AI

- Integrate AI into agency operations

- Enhance coordination between agencies on AI-related matters

On August 28, 2024 the California Assembly passed SB 1047, the Safe and Secure Innovation for Frontier AI Models Act. Unlike the federal Presidental Executive Order, this state law focused on creating a regulatory framework to test, register, and audit models that could present a danger to public safety. This AI regulation targets models with substantial investment in pretraining and fine-tuning above given thresholds of $100M/$10^{26}$ flops and $10M/$10^{25}$ flops respectively.

6.2 Laws and Regulations

AI regulation in the US represents somewhat of a departure from the more typical US approach to regulation. In the US, the legislative branch typically passes laws that form the framework for regulation, which are then enforced by the executive branch, primarily under the oversight of various federal agencies. For example, the US Congress passes laws that define specific industries or activities along with broad goals such as advancing scientific research [National Science Foundation, 2024], promoting fair markets [Security and Exchange Commission, 2024], and safeguarding the environment [Environmental Protection Agency, 2024] (see NSF, SEC and EPA mission statements and goals). At times, multiple agencies will be tasked with regulating different aspects of the same broad goal. For example, the Federal Trade Commission (FTC), the Consumer Product Safety Commission (CPSC), and the Consumer Financial Protection Bureau (CFPB) specialize in different aspects of consumer protection and safety.

US States and municipalities have also added regulations in areas they feel are inadequately addressed by federal regulations.

This approach is in keeping with historical norms. The philosophical distrust of centralized power is reflected in the very design of the American system of checks and balances between branches of government. A decentralized US approach is also a way to reduce bureaucratic layers, more directly empower domain experts, and balance power between competing narrow, self-interested parties. These include powerful voting blocks, special interests, and a $46 billion state and federal lobbying industry [Massoglia, 2024]. For these reasons, commercial applications of technology within the US have traditionally been regulated through various mechanisms including legislative action, executive orders, agency rulemaking, industry self-regulation, international agreements, and private self-regulation.

To remain competitive in rapidly changing world markets, US tech companies often pursue self-regulation as a strategy for tackling privacy, digital advertising, content moderation, and cybersecurity [Cusumano et al., 2021, Minow and Minow, 2023]. We see a similar approach taken in the Biden-Harris approach to securing voluntary commitments by leading AI companies to manage the risks posed by AI [The White House, 2023b]. Furthermore, international agreements or regulations are sometimes adopted by US companies to do business abroad, as in the case for EU's GDPR [European Union, 2016] and China's Cybersecurity Law [National People's Congress of the People's Republic of China, 2016]. The regulatory process often combines these approaches, with laws providing the foundation for agency regulations involving public input and expert consultation as technologies and circumstances evolve.

The rapid pace of AI innovation and the immense potential impact of AI, coupled with the lack of technical expertise in government, has reversed the normal sequence for enacting regulation that begins with the U.S. Congress. EO #14110 is a case where the executive branch is initiating many AI-related policies–from research to regulation–partly due to its ability to more quickly respond in a coherent and comprehensive manner The White House [2023b]. Although somewhat exceptional for the US process of lawmaking, White House Presidential executive orders more closely match the top-down, centralized organization of the European Commission in Brussels and the CCP in Beijing.

In spite of this similarity to the E.U. and China, aspects of the order nonetheless reflect the distinct US approach that can be characterized as "bottom-up" and distributed rather than "top-down" and centralized. In contrast to the more centralized, top-down approach to AI regulation prioritizing safety (EU) and social stability (China), the United States takes a more distributed, multistakeholder approach to AI regulation that mirrors its earlier approaches to regulating new technologies.

While universal directives on AI are provided by the centralized political bodies of the CCP and to a lesser extent, the European Commission, a wide range of guidelines, initiatives, laws, and other policies including trade related to AI are distributed between various US federal branches and agencies and even states [Perkins and Coie, 2024]. EO #14110 organizes this distributed

14

regulatory system with specific objectives and deadlines delegated to various federal agencies directly from the executive branch.

Meanwhile, the US legislative branch is considering dozens of individual bills [GovTrack.us, 2024]. Thune's 2023 AI Research, Innovation and Accountability Act would create enforceable accountability and transparency for high-risk systems. The REAL Political Advertisements Act [Klobuchar, 2023] aims to limit the use of Generative AI in campaigns, The Stop Spying Bosses Act [Casey, 2023] aims to limit the use of AI by employers to surveil employees, and the No FAKES Act [Coons et al., 2023] aims to protect visual and voice likenesses of individuals. Two notable, ambitious, and more restrictive plans have been introduced by Senator Schumer in the form of his SAFE initiative [Schumer, 2023] and the Blumenthal-Hawley Framework [Office of Senator Richard Blumenthal, 2024]. At this time, however, none have been passed. Meanwhile, individual US states and municipalities have passed laws and are debating more extensive regulation regarding AI [International Association of Privacy Professionals, 2024]. In 2023 more than 40 bills were proposed, and Texas and Connecticut adopted statutes focused on preventing discrimination [White and Case, 2024]. In the 2024 legislative session, at least forty states, Puerto Rico, The Virgin Islands and Washington D.C. have introduced AI bills and six states, Puerto Rico, the Virgin Islands have adopted resolutions or passed legislation [National Conference of State Legislatures, 2023]. While Article VI of the US Constitution affirms the supremacy of federal law over state law, California is home to many of the largest AI corporations, and other industries (e.g. auto emission levels) have often complied with Calfornia's stricter standards.

6.3 White House Executive Order 14110

Since 2016 and over three different Presidential administrations, a number of executive orders related to AI have been issued. The Biden White House's October 2023 "Executive Order on the Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence" is the most comprehensive to date [The White House, 2023b]. It directs over fifty federal agencies to take over one hundred specific actions addressing eight core policy areas listed in Figure 5 including: safety and security, innovation and competition, worker support, bias and civil rights, consumer protection, privacy, federal use of AI, and international leadership [The White House, 2024b]. The eight policy areas are ranked by the aggregate number of requirements and federal entities assigned to each area. These arguably provide a loose sense of priorities in each policy area from the most relevant (federal use, safety/security, and innovation/competition) to the least (worker support). EO #14110 implements many guidelines in the 2022 AI Bill of Rights to ensure the responsible design and use of artificial intelligence with regards to civil rights and privacy in areas such as hiring, healthcare, and surveillance [The White House, 2022].

EO #14110 also addresses many of the core concerns highlighted in the EU AI Act. It does so, however, with several key differences [Congressional Research Service, 2024]. While the EU AI Act establishes a new regulatory agency, the EU

Relevance	Policy Area	Requirements/Entities	Federal Entities *
H I G H	Federal use of AI	29 requirements 40 entities	OMB, OPM, CFO, GSA, etc.
	Safety and security	27 requirements 30 entities	NIST, DOE, DOC, SRMA, Treasury, DHS, DOD, etc.
	Innovation and competition	21 requirements 10 entities	DOS, DHS, DOL, NSF, USPTO, HHS, VA, DOE, PCAST, OSTP+
M E D I U M	Consideration of AI bias and civil rights	9 requirements 8 entities	DOJ, OPM, HHS, USDA, DOL, HUD, DHS, OSTP
	Consumer protection	9 requirements 5 entities	HHS, DOT, ED, DOD, VA
	Privacy	6 requirements 9 entities	OMB, NIST, NSF, FPC, ICSP, DOJ, CEA, OSTP, DOE
	International leadership	6 requirements 7 entities	DOC, DOS, USAID, DHS, NIST, DOE, NSF
L O W	Worker support	4 requirements 2 entities	CEA, DOL

Figure 5: Executive Order #14110 on the Safe, Secure, and Trustworth Development and Use of AI (* see Appendix A for agency acronyms)

AI Office, which coordinates with member states, industry and civil society, the current US strategy relies upon augmenting the extensive network of existing US federal agencies with pre-existing specialized domain expertise. The US approach can be seen to emphasize extending expansive regulatory and legal frameworks from the ground up where infrastructure already exists, in contrast to creating a new centralized regulatory framework.

Because the US approach involves over fifty federal agencies, it is also much more extensive in implementation details than the EU. It directly addresses broader issues like unemployment, education, research, and consumer protection. Finally, and again in contrast to the EU AI Act, this US strategy is arguably more immediately actionable given the over one hundred specific objectives. Many deadlines are delegated to federal agencies to be completed within 180 to 270 days. These agencies are already specialized across a broad spectrum of existing federal government responsibilities that are being disrupted by AI. As of this writing, both the White House 180-day and 270-day deadlines have been met [The White House, 2024c,d].

Enforcement is another major area of difference between the EU and the US. The EU AI Acts' risk model is premised upon prevention. General guidelines, specific penalties, and centralized regulation prohibit activities unless explicitly permitted. In contrast, the current US risk model is permissive. It promotes innovation through competition, encourages decentralized self-regulation, and

relies upon an extensive network of existing laws and regulations against abusive, illegal, and negligent practices. These networks of existing laws range over a wide spectrum, extending from specific consumer protection laws to evolving intellectual property laws [Walters and Wiseman, 2022]. This permissive approach follows the American tradition of tech sector self-regulation with its notable success in sectors like online advertising (DAA, NAI), cybersecurity (NIST, CISA), biotechnology (IGSC, IASB), nanotechnology (ISO, NanoRisk), and cloud computing (CSA).

Within this permissive structure, and in response to the White House EO 14110, the National Institute of Standards and Technology [NIST, 2024a] established the US AI Safety Institute in January of 2024. Housed within the larger Department of Commerce, NIST was originally established to facilitate U.S. industrial competitiveness. The US AI Safety Institute has members from academia, industry, and nonprofits. This partnership mirrors the kind of decentralized and voluntary approach discussed earlier. The US AI Safety Institute's initial task forces focus on safety, evaluation, measurement, and risk management. Their work follows upon the initial Risk Management Framework published in April 2024 [NIST, 2024b]. On July 12 2024 representatives from the US AI Safety Institute and the European AI Office met in Washington, D.C. and announced plans for further cooperation and collaboration [NIST, 2024c].

6.4 California SB 1047

The California Senate Bill 1047 (SB 1047: Safe and Secure Innovation for Frontier AI Models Act), introduced in February 2024 by Senator Scott Wiener, attempts to minimize potential negative societal impacts of AI in the face of rapid progress [LegiScan, 2024]. The bill emerged in response to growing concerns about the unique threats posed by powerful AI systems [GDPR Local, 2024]. It would affect nearly every leading AI company either based in Silicon Valley or doing business with California, the 5th largest economy in the world.

SB 1047 aims to establish a comprehensive AI regulatory framework in California that is more narrowly focused on 'frontier models' as defined by potential risks and computational resources [Anstey and Breslin, 2024]. The bill has garnered support from a diverse coalition of politicians and stakeholders including AI researchers, unions, and some technology companies advocating for responsible AI development [The Hill, 2024, Lovely, 2024, The Verge, 2024]. It has also faced opposition from politicians, industry groups, some AI researchers, and open-source advocates who worry about overly stringent regulations. Crit-
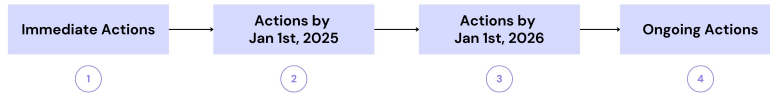

Figure 6: Action Timeline for SB 1047

ics fear the bill could stifle innovation, favor a handful of tech giants, and put California at a competitive disadvantage [Nunez, 2024, Abbott, 2024, Chilson and Stout, 2024, Abboud and Espinoza, 2023]. However, opinions are roughly split within traditional interest groups including large corporations, leading researchers, and politicians across both parties, leaving the future of SB 1047 somewhat uncertain.

Ongoing debates surrounding the bill's potential impact on US competitiveness, AI research and development continue. Uncertainties around costs, definition of key terms, and the feasibility of implementing requirements raise more immediate concerns. Much debate centers on the balance between fostering innovation and implementing safeguards [Foley and Lardner LLP, 2024, Morgan Lewis, 2024]. One of the most controversial aspects of SB 1047 is its requirement for developers to implement a full shutdown capability for covered AI models [Neontri, 2024]. Concerns have been raised over potential disruptions to critical infrastructure and services that may rely on these systems, a demonstration of the complex interdependencies and deep integration of AI with various sectors of the economy and society [LegiScan, 2024].

Since its introduction, SB 1047 has undergone several revisions in response to feedback from various stakeholders. Notable changes include narrowing the scope of pre-harm enforcement and potential liabilities based on site-specific plans. Controversial elements like the frontier model division, know your customer requirements, and uniform pricing were removed. Ambiguities in definitions like "covered models" were clarified to more precisely target high-impact AI systems. The scope of the required safety and security protocols were defined, and the timeline for compliance was adjusted to give companies more time to adapt to the new regulations [LegiScan, 2024]. These amendments demonstrate the iterative nature of the legislative process, particularly when dealing with rapidly-evolving technologies like AI and the conflicting interests of diverse stakeholders. As other jurisdictions both within the United States and internationally grapple with similar issues, the outcome of California's legislative efforts may have far-reaching impacts for the future of AI regulation and development [Foley and Lardner LLP, 2024].

Unlike the EU AI Act, which adopts a comprehensive, risk-based approach to AI regulation across various sectors and applications, SB 1047 appears to focus more narrowly on high-impact AI systems, particularly those trained using substantial computational resources [cmswire2024, euronews2024]. This targeted approach may reflect a philosophy that prioritizes regulating the most powerful and potentially influential AI models that have the greatest far-reaching societal impacts.

While the EU AI Act offers a degree of flexibility in implementation, allowing for tailored requirements for specific high-risk AI applications [Gracias, 2024], it is unclear whether SB 1047 adopts a similar approach. In contrast, the federal U.S. approach to AI regulation, which may influence SB 1047, typically involves adapting existing laws and regulatory frameworks to address AI-specific challenges. The special focus on the computational resources used to train frontier AI models suggest a unique regulatory philosophy in which the technical

potential of AI systems emerges as the key factor in determining regulatory requirements.

As shown in Figure 6, SB 1047's timeline for implementation and compliance, the bill is structured around specific milestones: immediate actions, actions required by January 1, 2026, actions required by January 1, 2027, and ongoing actions [smdailyjournal]. While detailed information about the specific requirements associated with each time frame is not available, this phased approach suggests a recognition of the need for a gradual implementation process, allowing stakeholders time to adapt to new regulatory requirements.

6.4.1   Immediate Actions

Figure 7 outlines a series of immediate actions that developers of covered AI models must undertake if SB 1047 is signed into law. These actions are designed to establish a framework for the responsible development, risk management, and public safety around the deployment of high-impact AI systems.

At the core of SB 1047's immediate requirements is the establishment of administrative, technical, and physical measures to prevent unauthorized access and misuse of covered models, with particular focus on defending against advanced persistent threats and sophisticated actors. However, the bill's specific cybersecurity requirements are not explicitly detailed.

Another key immediate action is the development of a safety and security protocol. This written document outlines procedures for managing risks throughout the model's lifecycle, including testing procedures to assess potential harm. Again, exact details of this protocol are not provided.
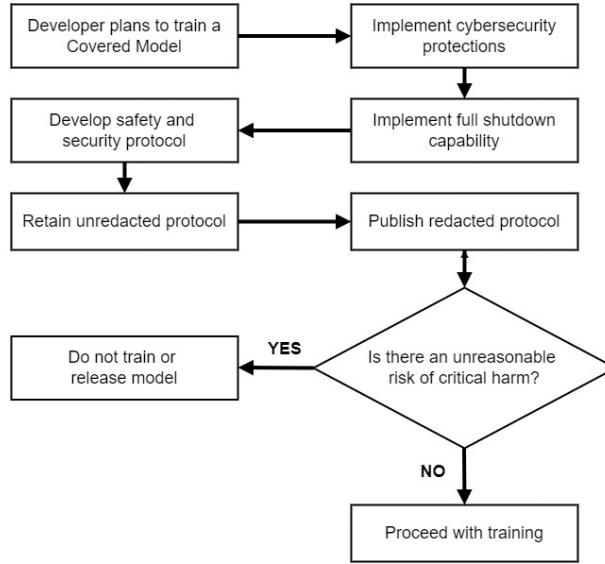
Figure 7: Immediate actions required according to CA SB 1047

6.4.2 Actions by January 2026

SB 1047 outlines a series of actions that developers of covered AI models must undertake by January 1, 2026, as illustrated in Figure 8. A key requirement is the implementation of annual third-party audits. Starting January 1, 2026, developers must engage independent auditors to assess their compliance with the bill's requirements. These audits, conducted according to regulations issued by the Government Operations Agency, require detailed reports evaluating internal controls and any instances of noncompliance. Developers are required to retain unredacted versions of these audit reports and provide access to the Attorney General upon request. In line with the bill's commitment to transparency, redacted versions of these reports must be published, with redactions limited to protecting sensitive information.

SB 1047 also mandates that developers submit annual compliance statements to the Attorney General. These statements, signed by the chief technology officer or a senior corporate officer, must include assessments of potential critical harms and verification of compliance with the bill's requirements. The bill also introduces a 72-hour reporting requirement for any AI safety incidents affecting covered models.

Furthermore, SB 1047 establishes a consortium within the Government Operations Agency tasked with developing a framework for "CalCompute," a public cloud computing cluster. This initiative, culminating in a report to be submitted to the Legislature by January 1, 2026, demonstrates a commitment to creating public infrastructure for AI development and research. These actions,
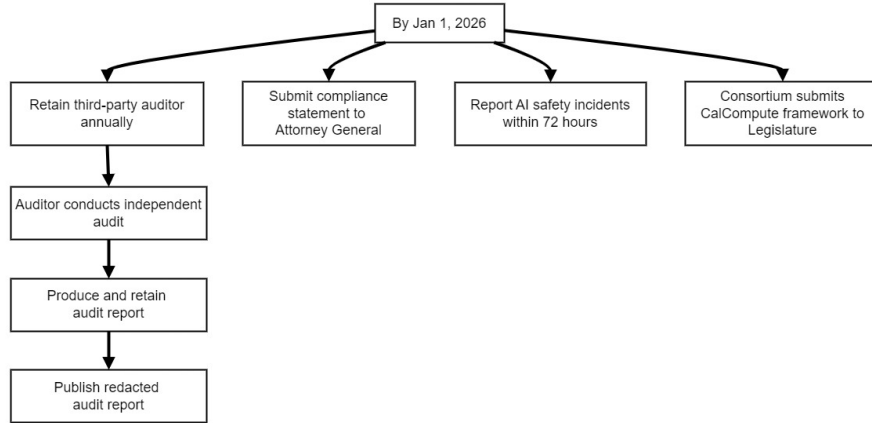
Figure 8: Actions required by Jan 1st, 2026 according to CA SB 1047

taken together, demonstrate the desire to create a more robust, transparent, and accountable ecosystem for AI development and deployment.

6.4.3 Actions by January 2027

SB 1047 also outlines a series of actions to be implemented by January 1, 2027, as illustrated in Figure 9. These actions are designed to establish a robust regulatory framework and governance structure for high-impact AI systems in California.

Actions include the establishment of the Board of Frontier Models within the Government Operations Agency. As shown in Figure 9, the board will consist of nine members with expertise in AI, safety, and related fields. Their primary responsibility will be to approve regulations and guidance, ensuring that the regulatory framework remains informed by the latest developments in AI technology and safety considerations.

By January 1, 2027, and annually thereafter, the Government Operations Agency is mandated to issue a set of regulations subject to approval by the Board of Frontier Models. These regulations serve three functions. First, they update the definition of "covered model," adjusting thresholds to reflect technological advancements and emerging risks. Second, they establish comprehensive auditing requirements, defining standards and best practices for the third-party audits introduced in the previous phase. Finally, they provide guidance on preventing critical harm and offer recommendations to developers on risk mitigation strategies.
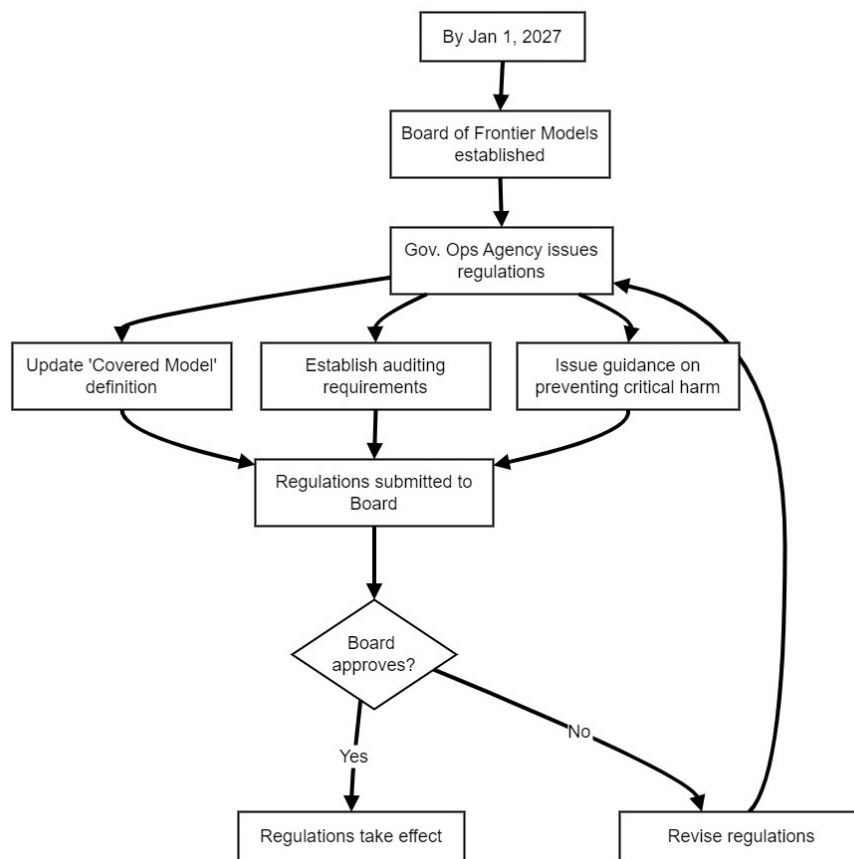
Figure 9: Actions required by Jan 1st, 2027 according to CA SB 1047

6.4.4   Ongoing Actions

Finally, SB 1047 outlines a comprehensive set of ongoing actions that developers and operators of high-impact AI systems must undertake to ensure continued compliance and safety, as illustrated in Figure 10. First and foremost, developers are required to engage in annual re-evaluations and updates of their safety and security protocols. This process ensures that protocols remain current and responsive to changes in model capabilities and industry best practices. Complementing this internal review, the bill mandates the continuation of annual third-party audits.

Figure 10 highlights the ongoing obligation for developers to report AI safety incidents within 72 hours of discovery. The bill also requires adherence to updated regulations issued by the Government Operations Agency: developers must remain compliant with the latest standards and definitions.

Of particular note is that SB 1047 introduces important protections for whistleblowers, prohibiting retaliation against employees who report non-compliance or risks. The bill also outlines specific responsibilities for operators of computing clusters. These include policies to assess customers' use of compute resources with a focus on those using resources sufficient to train covered models, along with a capability to enact full shutdowns if necessary.

Figure 10: Ongoing Actions required according to CA SB 1047

6.4.5 Enforcement

SB 1047 establishes an enforcement mechanism to ensure compliance with its provisions. It is designed to provide the necessary authority and tools to address violations and protect the public interest. The Attorney General is granted significant authority in enforcing SB 1047 and is empowered to bring civil actions against entities that violate the bill's provisions. This authority extends to halting non-compliant activities and seeking a range of remedies, including civil penalties and damages where appropriate.

The penalty structure is designed to be proportionate and impactful. Civil penalties are calculated based on the cost of compute used to train the model in question. This approach ensures that penalties are commensurate with the scale and potential impact of the AI system involved. Additionally, the bill provides for specific penalties for particular violations such as misrepresentation by auditors.

Protections and remedies are also established for whistleblowers. Employees who face retaliation for reporting non-compliance are granted the right to seek injunctive relief. These protections are cumulative with other laws, ensuring safeguards for individuals who come forward with concerns.

6.4.6 Veto and After Effects

On September 29th 2024, Governor Newsom vetoed SB 1047 [Newsom, 2024b] because he opposed standards solely based on model size and computational resources. Instead, he said it was necessary to consider whether

AI systems would be deployed in high-risk environments and involve critical decision-making. As an alternative, Newsom will consult with AI experts to develop more targeted guardrails for AI deployment and work with the legislature on more empirically-based regulation. Despite the veto, SB 1047 has significantly impacted the AI regulation debate by:

- Highlighting the need for proactive safety measures and accountability in AI development.

- Sparking discussions on the appropriate metrics for regulating AI, such as computational resources versus actual risks and impacts.

- Raising awareness about potential catastrophic risks associated with advanced AI systems.

- Demonstrating the challenges of balancing innovation with safety concerns.

- Encouraging industry stakeholders, startups, investors, and open-source developers to seriously consider AI safety and governance in their strategic planning.

The bill and subsequent veto have also revealed tensions between state-level and national approaches to AI regulation, as well as unlikely divisions and alliances within academia, industry, and government (see Appendix A). Many argue that a federal framework would be the more effective place to address AI regulation. Nonetheless, the debate over California SB 1047 will undoubtedly influence future regulatory efforts at both state and federal levels and could lead to more nuanced and effective AI regulation. Indeed, Governor Newsom has signed 17 AI-related bills in the month before his SB 1047 veto and established new initiatives with the CA legislature and AI experts to establish workable guardrails and empirical, science-based trajectory analysis of frontier models [Newsom, 2024a].

The bill and subsequent veto have also revealed tensions between state-level and national approaches to AI regulation, as well as unlikely divisions and alliances within academia, industry, and government (see Appendix A). Many argue that a federal framework would be more effective to address AI regulation. Nonetheless, the debate over California SB 1047 will likely influence future regulatory efforts at both state and federal levels. Governor Newsom signed an impressive 17 AI-related bills prior to his SB 1047 veto. Immediately after his veto, Newsom launched initiatives with the legislature and AI experts to develop workable AI guardrails. These initiatives also aim to create empirically-based predictions of future frontier model capabilities likely to target specific high-risk AI applications.

7   Conclusion

The EU, China, and the US are each evolving distinct regulatory systems that vary in approach and emphasis. The EU AI Act proposes a coherent, universal, risk-based regulatory framework with strict and well-defined penalties. It is criticized, however, for stifling innovation, using ambiguous language, and not anticipating expected challenges in implementation across heterogeneous use cases. The Chinese approach to AI regulation synthesizes the US approach of use-case specific laws with general guidelines translated into a centralized and comprehensive registration, testing, and monitoring framework. At the same time, innovation and economic growth is directly and indirectly supported by initiatives like investment in thousands of 'Little Dragons' alongside relatively lax enforcement for SMEs. This hybrid approach has led to a variety of surprising technological breakthroughs and economic successes, but it risks criticism of capriciousness given that regulations are not uniformly applied or enforced. The Biden White House Executive Order on "Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence" is the most organized plan in the US. It delegates over one hundred specific tasks to over fifty federal agencies in order to build out AI expertise and oversight according to specific domain expertise. The decentralized US approach also involves smaller regulatory initiatives by the US Congress, individual states like California, and even cities. This reflects the US market-driven approach acknowledging competing stakeholders. The approach has come under criticism, however, for relying too heavily on self-regulation and for being susceptible to flaws like regulatory capture. In response, California, home to most of the leading AI companies, introduced what is arguably the most stringent regulation. After ten major revisions, Governor Newsom vetoed the bill.

Growing trade tensions and geopolitical competition between the US and China are bolstering arguments for AI regulation policies favoring faster innovation and technological independence aligned with industrial policy. The US, with China following suite, has increased tariffs, coordinated international export bans, and imposed sanctions on strategic technologies like EVs, advanced chips, and semiconductor manufacturing equipment. These geopolitical tensions mean that the regulatory landscape will continue to evolve as countries re-evaluate their stance towards risk alongside their desire to remain at the forefront of AI development.

8   Contributions

- Jon Chun: The United States and China

- Christian Schroeder de Witt: The European Union

- Katherine Elkins: The United States

Each author has reviewed each other's section and takes responsibility for the content of their own.

References

A. Abbott. Coalition letter opposing california sb 1047, jun 2024. URL `https://laweconcenter.org/resources/coalition-letter-opposing-california-sb-1047/`. Accessed: 2024-09-17.

L. Abboud and J. Espinoza. EU's new AI Act risks hampering innovation, warns Emmanuel Macron. *Financial Times*, Dec. 2023. URL `https://www.ft.com/content/9339d104-7b0c-42b8-9316-72226dd4e4c0`.

M. Almada and A. Radu. The Brussels Side-Effect: How the AI Act Can Reduce the Global Reach of EU Policy. *German Law Journal*, pages 1–18, Feb. 2024. ISSN 2071-8322. doi: 10.1017/glj.2023.108. URL `https://www.cambridge.org/core/journals/german-law-journal/article/brussels-sideeffect-how-the-ai-act-can-reduce-the-global-reach-of-eu-policy/032C72AEC537EBB6AE96C0FD90387E3E`.

S. M. Anstey and M. J. Breslin. Proposed california ai law sb 1047 – an overview for developers, 2024. URL `https://ktslaw.com/en/insights/alert/2024/9/{468C5A1A-3410-4E0F-892F-83EA3602EF61}?pdf=1`. Accessed: 2024-09-16.

Bloomberg News. In its latest crackdown, china intensifies focus on real estate. *Aljazeera.com*, July 2021. URL `https://www.aljazeera.com/economy/2021/7/28/in-its-latest-crackdown-china-intensifies-focus-on-real-estate`. Accessed: May 2, 2024.

A. Bradford. The Brussels Effect: How the European Union Rules the World. *Faculty Books*, Mar. 2020. doi: https://doi.org/10.1093/oso/9780190088583.001.0001. URL `https://scholarship.law.columbia.edu/books/232`.

Caixin Global. Full text: Xi jinping's speech on boosting common prosperity. *Caixin Global*, October 2021. URL `https://www.caixinglobal.com/2021-10-19/full-text-xi-jinpings-speech-on-boosting-common-prosperity-101788302.html`. Accessed: May 2, 2024.

R. P. Casey. Stop spying bosses act, 2023. URL `https://www.congress.gov/bill/118th-congress/senate-bill/262/text`.

Chatham House. The EU's new AI Act could have global impact | Chatham House – International Affairs Think Tank, Mar. 2024. URL `https://www.chathamhouse.org/2024/03/eus-new-ai-act-could-have-global-impact`.

L. Y. Chen and L. Liu. China ends tech crackdown with fines on tencent, ant group. *Bloomberg.com*, July 2023. URL `https://www.envoy.cirrus.bloomberg.com/news/articles/2023-07-07/china-ends-probe-of-jack-ma-backed-ant-with-984-million-fine?srnd=premium`. Accessed: May 2, 2024.

N. Chilson and K. Stout. Coalition letter opposing california sb 1047, jun 2024. URL https://laweconcenter.org/resources/coalition-letter-opposing-california-sb-1047/. Accessed: 2024-06-20.

China Money Network. Chinese tech giants dominate ai algorithms with a focus on industry-specific applications. *China Money Network*, March 2024. URL https://www.chinamoneynetwork.com/2024/03/07/chinese-tech-giants-dominate-ai-algorithms-with-a-focus-on-industry-specific-applications. Accessed: May 2, 2024.

ChinaTalk. Hugging face blocked! 'self-castrating' china's ml development + jordan at apec. *ChinaTalk*, October 2023. URL https://www.chinatalk.media/p/hugging-face-blocked-self-castrating. Accessed: May 2, 2024.

cmswire2024. Is california's sb-1047 the future of ai regulation?, 2024. URL https://www.cmswire.com/digital-experience/is-california-sb-1047-the-future-of-ai-regulation/. Accessed: 2024-09-18.

Congressional Research Service. The made in china 2025 initiative: Economic implications for the united states, April 2019. URL https://crsreports.congress.gov/product/pdf/IF/IF10964/4. Accessed: May 2, 2024.

Congressional Research Service. Highlights of the 2023 executive order on artificial intelligence for congress, 2024. URL https://crsreports.congress.gov/product/pdf/R/R47843/8. Accessed: May 2, 2024.

Consilium. Artificial intelligence act: Council and Parliament strike a deal on the first rules for AI in the world, 2023. URL https://www.consilium.europa.eu/en/press/press-releases/2023/12/09/artificial-intelligence-act-council-and-parliament-strike-a-deal-on-the-first-worldwide-rules-for-ai/.

C. Coons, M. Blackburn, A. Klobuchar, and T. Tillis. No fakes act, 2023. URL https://www.coons.senate.gov/imo/media/doc/no_fakes_act_one_pager.pdf.

M. A. Cusumano, A. Gawer, and D. B. Yoffie. Social media companies should self-regulate. now. *Harvard Business Review*, January 2021. URL https://hbr.org/2021/01/social-media-companies-should-self-regulate-now.

F. Eiras, A. Petrov, B. Vidgen, C. S. de Witt, F. Pizzati, K. Elkins, S. Mukhopadhyay, A. Bibi, B. Csaba, F. Steibel, F. Barez, G. Smith, G. Guadagni, J. Chun, J. Cabot, J. M. Imperial, J. A. Nolazco-Flores, L. Landay, M. Jackson, P. Röttger, P. H. S. Torr, T. Darrell, Y. S. Lee, and J. Foerster. Near to Mid-term Risks and Opportunities of Open-Source Generative AI, May 2024a. URL http://arxiv.org/abs/2404.17047. arXiv:2404.17047 [cs].

F. Eiras, A. Petrov, B. Vidgen, C. Schroeder, F. Pizzati, K. Elkins, S. Mukhopadhyay, A. Bibi, A. Purewal, C. Botos, F. Steibel, F. Keshtkar, F. Barez, G. Smith, G. Guadagni, J. Chun, J. Cabot, J. Imperial, J. A. Nolazco, L. Landay, M. Jackson, P. H. S. Torr, T. Darrell, Y. Lee, and J. Foerster. Risks and Opportunities of Open-Source Generative AI, May 2024b. URL http://arxiv.org/abs/2405.08597.

Environmental Protection Agency. About page, our mission and what we do, 2024. URL https://www.epa.gov/aboutepa/our-mission-and-what-we-do. Accessed: July 16, 2024.

EU AI Act. Why work at the EU AI Office? | EU Artificial Intelligence Act, 2024. URL https://artificialintelligenceact.eu/why-work-at-the-eu-ai-office/.

euronews2024. A big win for the eu - how california's ai legislation compares to the eu ai act, 2024. URL https://www.euronews.com/next/2024/09/11/a-big-win-for-the-eu-how-californias-ai-legislation-compares-to-the-eu-ai-act. Accessed: 2024-09-18.

European Commission. European AI Office | Shaping Europe's digital future, 2024. URL https://digital-strategy.ec.europa.eu/en/policies/ai-office.

European Union. Regulation (eu) 2016/679 of the european parliament and of the council of 27 april 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data (general data protection regulation), article 7, 2016. URL https://eur-lex.europa.eu/eli/reg/2016/679/oj. Accessed: 2024-09-08.

European Union. Directive (eu) 2019/790 of the european parliament and of the council of 17 april 2019 on copyright and related rights in the digital single market and amending directives 96/9/ec and 2001/29/ec, 2019. URL https://eur-lex.europa.eu/eli/dir/2019/790/oj. Accessed: 2024-09-08.

European Union. Regulation (eu) 2024/123 of the european parliament and of the council of 21 may 2024 laying down harmonised rules on artificial intelligence (artificial intelligence act), 2024. URL https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52021PC0206. Accessed: 2024-09-08.

Foley and Lardner LLP. California dreamin': Sb 1047 and ai innovation, 2024. URL https://www.foley.com/insights/publications/2024/07/california-dreamin-sb-1047-ai-innovation/. Accessed: 2024-09-16.

GDPR Local. California's senate bill 1047: Key takeaways on california's ai safety bill, 2024. URL https://gdprlocal.com/californias-senate-bill-1047-key-takeaways-on-californias-ai-safety-bill/. Accessed: 2024-09-16.

Global Times. China to develop 10,000 'little giants' in push for advanced manufacturing. *GlobalTimes.cn*, July 2021. URL `https://www.globaltimes.cn/page/202107/1227877.shtml`. Accessed: May 2, 2024.

GovTrack.us. Govtrack.us, 2024. URL `https://www.govtrack.us/`. Accessed: 16 Sept. 2024.

S. Gracias. Comparing eu ai act to proposed ai-related legislation in the us. *University of Chicago Business Law Review*, 2024.

Huggingface.co. Models, May 2024. URL `https://huggingface.co/models`. Accessed: May 2, 2024.

Information Technology and Innovation Foundation (ITIF). How innovative is china in ai? ITIF, 2024. URL `https://itif.org/publications/2024/08/26/how-innovative-is-china-in-ai/`. Accessed: 2024-09-23.

International Association of Privacy Professionals. Us state ai governance legislation tracker, 2024. URL `https://iapp.org/resources/article/us-state-ai-governance-legislation-tracker/`. Accessed: 16 Sept. 2024.

International Monetary Fund. World economic outlook: April 2024, April 2024. URL `https://meetings.imf.org/en/IMF/Home/Publications/WEO/Issues/2024/04/16/world-economic-outlook-april-2024`. Accessed: May 2, 2024.

G. Intresse. China's new draft regulations for after-school tutoring. *China-Briefing.com*, February 2024. URL `https://www.china-briefing.com/news/china-after-school-tutoring-new-draft-regulations-key-points/`. Accessed: May 2, 2024.

A. Klobuchar. Real political advertisements act, 2023. URL `https://www.congress.gov/bill/118th-congress/senate-bill/1596/text`.

LAION. A Call to Protect Open-Source AI in Europe | LAION, 2023. URL `https://laion.ai/notes/letter-to-the-eu-parliament`.

LegiScan. California senate bill 1047: Safe and secure innovation for frontier Artificial Intelligence models act, 2024. URL `https://legiscan.com/CA/text/SB1047/2023`. Accessed: May 1, 2024.

Linklaters. Data Protected Philippines| Insights | Linklaters, 2024. URL `https://www.linklaters.com/en/insights/data-protected/data-protected---philippines`.

G. Lovely. Sag-aftra and women's groups urge gavin newsom to sign ai safety bill, sep 2024. URL `https://www.theverge.com/2024/9/11/24242142/sag-aftra-ai-now-gavin-newsom-safety-sb-1047-letters`. Accessed: 2024-09-18.

T. Madiega. Artificial intelligence act, 2024. URL `https://www.europarl.europa.eu/RegData/etudes/BRIE/2021/698792/EPRS_BRI(2021)698792_EN.pdf`.

A. Massoglia. State and federal lobbying spending tops $46 billion after federal lobbying spending broke records in 2023. *OpenSecrets.com*, January 2024. URL `https://www.opensecrets.org/news/2024/01/state-and-federal-lobbying-spending-tops-46-billion-after-federal-lobbying-spending-broke-records-in-2023`.

M. Minow and N. Minow. Social media companies should pursue serious self-supervision— soon: Response to professors douek and kadri. *Harvard Law Review*, June 2023. URL `https://harvardlawreview.org/forum/vol-136/social-media-companies-should-pursue-serious-self-supervision-soon-response-to-professors-douek-and-kadri/`.

Morgan Lewis. California's sb 1047 would impose new safety requirements for developers of large-scale ai models, 2024. URL `https://www.morganlewis.com/pubs/2024/08/californias-sb-1047-would-impose-new-safety-requirements-for-developers-of-large-scale-ai-models`. Accessed: 2024-09-16.

National Conference of State Legislatures. Ai 2024 legislation, June 2023. URL `https://www.ncsl.org/technology-and-communication/artificial-intelligence-2024-legislation`. Accessed: July 12, 2024.

National People's Congress of the People's Republic of China. Cybersecurity law of the people's republic of china, November 2016. URL `https://www.cac.gov.cn/2016-11/07/c_1119867116.htm`. Adopted at the 24th Meeting of the Standing Committee of the Twelfth National People's Congress of the People's Republic of China.

National Science Foundation. About, 2024. URL `https://new.nsf.gov/about`. Accessed: July 16, 2024.

Neontri. California senate bill 1047, 2024. URL `https://neontri.com/blog/california-senate-bill-1047/`. Accessed: 2024-09-16.

G. Newsom. Office of the governor, 2024a. URL `https://www.gov.ca.gov/2024/09/29/governor-newsom-announces-new-initiatives-to-advance-safe-and-responsible-ai-protect-californians/#:~:text=What%20you%20need%20to%20know:%20Governor%20Newsom%20announced%20that%20the`. Accessed: 2024-09-23.

G. Newsom. Office of the governor, 2024b. URL `https://www.gov.ca.gov/wp-content/uploads/2024/09/SB-1047-Veto-Message.pdf#:~:text=I%20am%20returning%20Senate%20Bill%201047%20without%20my%20signature.%20This`. Accessed: 2024-09-23.

NIST. About, 2024a. URL `https://www.nist.gov/about-nist`. Accessed: July 16, 2024.

NIST. Ai risk management framework, 2024b. URL `https://www.nist.gov/itl/ai-risk-management-framework`. Accessed: July 16, 2024.

NIST. Ai safety institute and european ai office hold technical dialogue, July 2024c. URL `https://www.nist.gov/news-events/news/2024/07/us-ai-safety-institute-and-european-ai-office-hold-technical-dialogue`. Accessed: July 16, 2024.

M. Nunez. Ai safety showdown: Yann lecun slams california's sb 1047 as geoffrey hinton backs new regulations, sep 2024. URL `https://venturebeat.com/ai/ai-safety-showdown-yann-lecun-slams-californias-sb-1047-as-geoffrey-hinton-backs-new-regulations/`. Accessed: 2024-09-18.

OECD. OECD Principles on AI, 2019. URL `https://www.oecd.org/going-digital/ai/principles/`. Accessed: 2024-09-08.

R. of the Philippines. Republic act no. 10173: Data privacy act of 2012. `https://www.privacy.gov.ph/data-privacy-act/`, 2012. Enacted on August 15, 2012.

Office of Senator Richard Blumenthal. Blumenthal & hawley announce bipartisan framework on artificial intelligence legislation, April 2024. URL `https://www.blumenthal.senate.gov/newsroom/press/release/blumenthal-and-hawley-announce-bipartisan-framework-on-artificial-intelligence-legislation`. Accessed: May 2, 2024.

E. Parliament and C. of the European Union. Regulation (eu) 2022/1925 of the european parliament and of the council of 14 september 2022 on contestable and fair markets in the digital sector (digital markets act). `https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32022R1925`, 2022. Official Journal of the European Union, L 265/1, 12 October 2022.

Perkins and Coie. States begin to regulate ai in the absence of regulation, May 2024. URL `https://www.perkinscoie.com/en/news-insights/states-begin-to-regulate-ai-in-absence-of-federal-legislation.html`. Accessed: July 16, 2024.

B. Perrigo. Exclusive: OpenAI Lobbied E.U. to Water Down AI Regulation, June 2023. URL `https://time.com/6288245/openai-eu-lobbying-ai-act/`.

G. Sartor and F. Lagioia. The impact of the general data protection regulation (gdpr) on artificial intelligence. Study PE 641.530, European Parliamentary Research Service (EPRS), 2020. URL `https://www.europarl.europa.eu/`

RegData/etudes/STUD/2020/641530/EPRS_STU(2020)641530_EN.pdf. Scientific Foresight Unit (STOA), Panel for the Future of Science and Technology.

C. Schumer. Sen. chuck schumer launches safe innovation in the ai age at csis, June 2023. URL `https://www.csis.org/analysis/sen-chuck-schumer-launches-safe-innovation-ai-age-csis`. Accessed: May 1, 2024.

Security and Exchange Commission. About and mission, 2024. URL `https://www.sec.gov/about/mission`. Accessed: July 16, 2024.

M. Sheehan. Tracing the roots of china's ai regulations. *Carnegie Endowment for International Peace*, February 2024. URL `https://carnegieendowment.org/2024/02/27/tracing-roots-of-china-s-ai-regulations-pub-91815`. Accessed: May 2, 2024.

smdailyjournal. Deep dive into sb-1047, 2024. URL `https://www.smdailyjournal.com/opinion/columnists/deep-dive-into-sb-1047/article_fb548bf2-278c-11ef-8307-a72b52b6e079.html`. Accessed: 2024-09-16.

S. Smit et al. Addressing the european technology gap. McKinsey & Company, 2022. URL `https://www.mckinsey.com/capabilities/strategy-and-corporate-finance/our-insights/securing-europes-competitiveness-addressing-its-technology-gap`. Accessed: 2024-09-22.

K. Suominen. On the rise: Europe's competition policy challenges to technology companies. Center for Strategic and International Studies (CSIS), 2020. URL `https://www.csis.org/analysis/rise-europes-competition-policy-challenges-technology-companies`. Accessed: 2024-09-22.

The Hill. Ai employees support california ai bill. *The Hill*, 2024. URL `https://thehill.com/policy/technology/4869225-ai-employees-support-california-ai-bill/`. Accessed: 2024-01-15.

The Privacy Advisor Podcast. The Privacy Advisor Podcast: Inside the EU AI Act negotiations: A discussion with Laura Caroli, 2024. URL `https://privacyadvisorpodcast.libsyn.com/inside-the-eu-ai-act-negotiations-a-discussion-with-laura-caroli`.

The State Council of the People's Republic of China. Made in china 2025, 2015. URL `https://english.www.gov.cn/2016special/madeinchina2025/`. Accessed: May 2, 2024.

The Verge. California's sb-1047 ai industry regulation faces backlash, 2024. URL `https://www.theverge.com/2024/9/11/24226251/california-sb-1047-ai-industry-regulation-backlash`. Accessed: 2024-09-16.

The White House. Blueprint for an ai bill of rights, October 2022. URL `https://www.whitehouse.gov/ostp/ai-bill-of-rights/`. Accessed: 2024-05-02.

The White House. Fact sheet: Biden-harris administration secures voluntary commitments from leading artificial intelligence companies to manage the risks posed by ai, July 2023a. URL `https://www.whitehouse.gov/briefing-room/statements-releases/2023/07/21/fact-sheet-biden-harris-administration-secures-voluntary-commitments-from-leading-artificial-intelligence-companies-to-manage-the-risks-posed-by-ai/`. Accessed: 2024-05-02.

The White House. Executive order on the safe, secure, and trustworthy development and use of artificial intelligence, October 2023b. URL `https://www.whitehouse.gov/briefing-room/presidential-actions/2023/10/30/executive-order-on-the-safe-secure-and-trustworthy-development-and-use-of-artificial-intelligence/`. Accessed: 2024-09-25.

The White House. Potential labor market impacts of artificial intelligence: An empirical analysis, July 2024a. URL `https://www.whitehouse.gov/wp-content/uploads/2024/07/Potential-Labor-Market-Impacts-of-Artificial-Intelligence-An-Empirical-Analysis-July-2024.pdf`. Accessed: 2024-09-25.

The White House. Administration actions on ai, March 2024b. URL `https://ai.gov/actions/`. Accessed: 2024-09-25.

The White House. Biden-harris administration announces key ai actions 180 days following president biden's landmark executive order, April 2024c. URL `https://www.whitehouse.gov/briefing-room/statements-releases/2024/04/29/biden-harris-administration-announces-key-ai-actions-180-days-following-president-bidens-landmark-executive-order/`. Accessed: 2024-05-02.

The White House. Fact sheet: Biden-harris administration announces new ai actions and receives additional major voluntary commitment on ai, July 2024d. URL `https://www.whitehouse.gov/briefing-room/statements-releases/2024/07/26/fact-sheet-biden-harris-administration-announces-new-ai-actions-and-receives-additional-major-voluntary-commitment-on-ai/`. Accessed: 2024-09-25.

J. Tyrangiel. Opinion | I found the smartest politician on AI. It's no one you'd expect. *Washington Post*, Mar. 2024. ISSN 0190-8286. URL `https://www.washingtonpost.com/opinions/2024/03/20/ai-europe-regulation-leading/`.

UN AI Advisory Body. Governing ai for humanity, September 2024. URL `https://www.un.org/sites/un2.un.org/files/governing_ai_for_humanity_final_report_en.pdf`. Accessed: 2024-09-18.

D. Walters and H. J. Wiseman. Self-regulation in the cradle: The role of standards in emerging industries. *SSRN Electronic Journal*, 2022. doi: 10.2139/ssrn.4226081.

Z. Warso, M. Gahntz, and P. Keller. Sufficiently detailed? a proposal for implementing the ai act's training data transparency requirement for gpai, June 2024. URL `https://openfuture.eu/wp-content/uploads/2024/06/240618AIAtransparency_template_requirements-2.pdf`. This report is published under the terms of the Creative Commons Attribution License.

G. Webster, J. Zhou, M. Shi, H. Dorwart, J. Costigan, and Q. Chen. Forum: Analyzing an expert proposal for china's artificial intelligence law. *DigiChina, Stanford University*, August 2023. URL `https://digichina.stanford.edu/work/forum-analyzing-an-expert-proposal-for-chinas-artificial-intelligence-law/`. Accessed: May 2, 2024.

White and Case. Ai watch global regulatory tracker us, 2024. URL `https://www.whitecase.com/insight-our-thinking/ai-watch-global-regulatory-tracker-united-states`. Accessed: 2024-09-25.

Z. Yang. Why the chinese government is sparing ai from harsh regulations—for now. *MIT Technology Review*, April 2024. URL `https://www.technologyreview.com/2024/04/09/1091004/china-tech-regulation-harsh-zhang/`. Accessed: May 2, 2024.

A. Zhang. *High Wire: How China Regulates Big Tech and Governs Its Economy*. Oxford University Press, 2022.

A. H. Zhang. How china regulates big tech and governs ai, March 2024. URL `https://www.youtube.com/watch?v=NS1DGd2IXDs`. Philip K.H. Wong Centre for Chinese Law [Video]. YouTube. Accessed: May 2, 2024.

Appendix A: Sample of Diverse Supporters and Opponents of California SB 1047

Side	Category	Name	Description
Pro	Politician	Sen. Anthony Wiener	`https://tinyurl.com/4ub8u7ha`
Pro	Academics	Yoshua Bengio, Geoffrey Hinton, Lawrence Lessig, Stuart Russell	`https://safesecureai.org/experts`
Pro	Academic	Dan Hendrycks	`https://tinyurl.com/ytn7vcfr`
Pro	AI Researchers	Call to Lead	`https://calltolead.org/`
Pro	AI Non-Profit	Center for AI Safety	`https://www.safe.ai/work/statement-on-ai-risk`
Pro	AI Frontier Corp	OpenAI	`https://tinyurl.com/2s42ndr5`
Pro	AI Frontier Corp	Anthropic	`https://tinyurl.com/yth2k2hn`
Pro	Hollywood	Actors and Unions	`https://tinyurl.com/4ad85wzu`
Pro	Entrepreneur	Elon Musk	`https://x.com/elonmusk/status/1828205685386936567`
Con	Politician	Sen. Nancy Pelosi	`https://tinyurl.com/y25yrre9`
Con	Politician	Rep. Ro Khanna	`https://tinyurl.com/3sz3jwns`
Con	Politician	SF Mayor London Breed	`https://tinyurl.com/3664wwua`
Con	Academic	Yan LeCun	`https://x.com/ylecun/status/1807552057466909156`
Con	Academic	Fei-Fei Li	`https://tinyurl.com/4b9uzctb`
Con	Academics	CalTech	`https://tinyurl.com/2xf6xcw5`
Con	AI Frontier Corp	Meta	`https://tinyurl.com/y2sus9xp`
Con	AI Frontier Corp	Google	`https://tinyurl.com/adseybwp`
Con	AI Non-Profit	The AI Alliance	`https://thealliance.ai/core-projects/sb1047`
Con	Thought Leaders	Investors, Entrepeneurs and Academics	`https://tinyurl.com/26h9f397`

Table 1: Split among leading voices on California SB 1047 does not follow traditional dividing lines