Governance and Legitimacy of Artificial Intelligence

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Abstract - **Amids challenges posed to humanity by artificial intelligence disruptive developments, this work is set to engage discussants from different perspectives -encompassing scientists in different fields, governments, firms and other social actors- on the topics of artificial intelligence, governance and legitimacy. The main aim and output of the paper is to present a dashboard for the analysis of governance and legitimacy of artificial intelligence. This Dashboard resolves disputes within the literature on political theory over classical approaches to study governance and legitimacy. The Dashboard has also the capacity to allow for comparisons in AI governance and legitimacy in democratic and non democratic regimes, at different government levels, both in Western Countries and in the Global South. An additional output is the application of the framework to the case of China as a case study. This analysis is carried out by applying the framework to take a fresh look at existing data in the Chinese case and showing its value as a methodological and analytical tool.**

Keywords - Artificial intelligence; democracy; ethics; political theory; governance.

I. INTRODUCTION

This work is an extended version of "AI Philosophy: Sources of Legitimacy to Analyze Artificial Intelligence," a paper presented to the IARIA Annual Congress on Frontiers in Science, Technology, Services, and Applications in 2023 [1]. This extended version aims to present a general framework to analyze artificial intelligence (AI), and to discuss legitimacy and governance from political theory as a stream of philosophy. As such, the work addresses questions related to governance and legitimacy that are at the basis of political and social power and of command and control. At the end of 2020, Pfizer-BioNTech vaccine based on mRNA molecules made a breakthrough, allowing for a first treatment against the COVID-19 plague. The vaccine used modified RNA molecules and ferried them for the first time as a drug into cells. This vaccine was made possible with complexity, using algorithms departing from a strict digital approach to more complex algorithms incorporating layers, in the same ways that neurons branch out in the human brain. This fascinating breakthrough furthers -even more- the appetite for competition among the big actors: Google, Elon Musk, the Chinese government, among others, all wanting to reach a trillion operations in machine learning [2]. The example of the COVID-19 vaccine brings us the evidence of the importance of the use of algorithms for the good of humanity. From the point of view of physics and biology, Contera stresses that reality is not digital, it is analog, and therefore complex: Current artificial intelligence seeks to achieve this complexity by including new parameters and new interactions [2]. But there are limitations to this pattern of development towards complexity: the first is based on energy reasons - the cost of computations and the blockchain is very high. The second limitation is based on geopolitical reasons. Taiwan is currently the only country capable of producing a computing chip below the size of five nanometers [2]. This makes the United States, Western economies and the global south heavily dependent on a single company, TSMC, for the supply of leading edge technology chips. Only TSMC in Taiwan and Samsung in South Korea can make the most advanced semiconductors, and this, for the case of Taiwan exposure to China, is interpreted by the United States as putting at risk the ability "to supply current and future [US] national security and critical infrastructure needs" according to María Ryan [3][4]. This is evident when the United States Department of Commerce's Bureau of Industry and Security announces the implementation of export controls to restrict China's ability to both purchase and manufacture certain high-end chips used in military applications on October 7th, 2022. This actually means restricting China's ability to obtain advanced computing chips, develop and maintain supercomputers, and manufacture advanced semiconductors. Similar risks -and opportunities- are perceived by China. Both risks and opportunities underlie the Chinese Party Constitutional amendment made in October 2022, looking forward to making sustained and steady progress with the One Country, Two Systems policy, advancing national reunification with Taiwan [5].

Thus, this work applies the political theory framework to China, bearing in mind the context and very interesting issues at hand: competitive interests and domestic preferences, economic development, national security and social control. There are challenges in trying to tame the beast of reality -as the big actors are seeking to do

with algorithms- and with the resources and human talent that are assigned for the task. These challenges make the study of current changes in artificial intelligence (AI) from the perspective of social sciences, and in particular from the perspective of legitimacy and democracy -or the lack thereof- interesting and acute. Other questions related to political theory also motivate this study: what can we learn about the complex reality of AI related to command and control in China? What may we learn about the future society and the polity against AI development in China? And, are there any particular cultural values enshrined in the country´s AI development?

In the following sections, the methodology is introduced and a general theoretical framework is proposed, the case study of sources of legitimacy and control in China follows, and finally a discussion with conclusion and further work is presented, followed by acknowledgements.

II. METHODOLOGY

The methodology of this research seeks to bring basic questions linked to legitimacy - a basis of governance- into the study of artificial intelligence. The purpose is to reflect upon how artificial intelligence is going to affect democratic and non democratic regimes.

The study departs from classical publications in political theory by Max Weber and Craig Mathesson [6][7], whose approaches combined allow to draft a table with an eight dimensional view of sources of legitimacy. These approaches taken combined, however, are unable to capture new features linked to legitimacy when artificial intelligence is taken into account. Searching for what is missing in these classical inquiries when AI is taken into account a new theoretical framework is developed. This new theoretical framework allows for a comparison of national cases, and eventually, supranational and subnational cases. The selection of studies started by a search in scopus with the terms artificial intelligence AND China in 2020, 2021, 2022. This brought about 776 articles. The selection was further refined under the social sciences category, with 170 documents published matching the query. These journal articles were reviewed looking for governance and legitimacy as topics for retrieval and further work, identifying 37 source articles. Once first relevant works were identified, the reference list of these articles became a main source of materials -both those that were included in the scopus database or were not- as detailed knowledge became crucial to build up the study. Google scholar was also utilized, searching for the first 10 publications on artificial intelligence and social sciences, the 10 most cited, and the ten most recent ones. These works were reviewed searching for interesting insights. Proquest database has also been consulted, with the query artificial intelligence in the Financial Times newspaper. Specific articles on the query were of value to identify authors with new ideas on artificial intelligence nowadays and how AI affects governance. As a result, these searches brought about information from comparative reports with general information on the United States [8], the work on Europe [9][10], and on China and

China local AI ecosystems [11][12], which is the focus for the purpose of this work.

This research and discussion have been pursued without the aid of artificial intelligences or data bases in the process of ideas. Research and discussion are the result of a human mind. There is no use of any big data software, organic life engineering, or cyborg aid. Thus, at this stage, the results of the work are solely the responsibility of a human author´s mind. At a future stage, it could be explored whether there are interesting possibilities from non natural intelligences to broaden the scope and findings of this research.

III. THEORETICAL FRAMEWORK OF AI GOVERNANCE: FROM RELATED WORK TO SOURCES OF LEGITIMACY TO ANALYZE ARTIFICIAL INTELLIGENCE

The theoretical framework is based on the sources of legitimacy to analyze artificial intelligence. Here we are bringing to the fore political theory to address a contemporary problem: AI governance. This is what the paper tries to achieve, a better understanding of governance in the context of AI. For this purpose, in this part of the work, Table I, including an eight dimensional view of sources of legitimacy is developed. Table I is based on dimensions, concepts and definitions from classical works by Max Weber and Craig Mathesson [6][7]. With over five million mentions in Google Scholar, Weber´s work is a reference to explain politics, society and economics. Decades later Mathesson includes democracy as a fundamental axis to review Weber's approach on legitimacy. The current work argues that there is room for further improvement, departing from the insights from these two authors. Improvement is pursued in two steps: Step one is developing a framework for analysis based on the theories of these two authors, the eight dimensional view of sources of legitimacy. Step two, in the following section, follows, with the next stage, using fundamental questions from political theory to address the contemporary problem of AI governance. In doing so, method -as source of change- and legitimacy are enshrined in the Gil dashboard making up for an upgraded theoretical framework. The new Dashboard has been developed in a wider context that is not addressed in this article: The wider context aims to compare the AI regulatory framework of China, the European Union and the United States [8]-[12], which is the endeavor the author is currently devoted to in a wider research. The current work focuses on the theoretical dashboard that has been developed to make the comparisons. Using a name for the Dashboard follows the practice of using the name of the author for scales –such as Sherry Arnstein Ladder of Citizen Participation, one of the most influential models in the field of democratic public participation; it also has the purpose of setting a reference for further discussion across disciplines.

The following work tries to unveil a complex reality, 1) where there are new rules attached to command and control derived from the use of AI in political regimes and 2) to bring to light new ways of thinking about AI, governance and legitimacy. A framework for analysis, the Gil dashboard for legitimacy is developed. The dashboard

allows for comparisons of most similar and most different cases. The theoretical framework is in the intersection between values and AI development, and allows to unveil how AI is mediating problems related to coordination and control, what uncertainties about the future society and the polity different countries face against AI development, and what could we say about different cultural values.

We depart from the work on legitimacy from Max Weber -for whom there exist three types of domination, charismatic, traditional and rational or legal [6]. This framework was revised by Matheson [7] in 1987, nearly a century after Weber started writing. Matheson qualifies and opposes Max Weber theory on legitimacy. Later on, and departing from Matheson, the current work develops a theoretical framework to allow for the comparison of AI legitimacy bases in the European Union, the United States and China - and could be valuable for the analysis of developing countries, and countries in the global south.

TABLE I. THE EIGHT DIMENSIONAL VIEW OF SOURCES OF LEGITIMACY, BY OLGA GIL

Dimension	Definition of the dimension
Convention	Norms, rules: legal or customary rules that prescribe forms of behavior
Contract as basis of legitimacy	Mutual rights and obligations. The theory of consent as the basis of obligations
Basis of legitimacy in a conformity with universal principles: natural law	Theories of natural law, aka, the existence of a natural order superior to man-made law
Sacredness of authority	Power-holder or his/her norms considered to be sacred divine right of reigns. For Max Weber it could also be an attribute of an office rather than a person
Legitimacy by expertise	Technical expertise, in the vein defended by Saint-Simon, Taylorian theories, or historic laws
A popular mandate in a constitutional democracy	Popular mandate: a claim to democratic election in accordance with constitutional procedures. Based on constitutionalism, power holders elected in accordance with constitutional procedures. Here we find a distinction between populist democracies, where the will of a majority rules, and constitutional democracies, were there will of the majority is limited by a constitution
Personal relation	Domination, in which there are close ties between power-holders and power-subjects such as personal authority or paternal authority relationships
Personal quality of the power holder	Domination based on the personal quality of the power holder, by virtue of which he/she can claim a right of command

Weber differentiated three types of domination: charismatic, traditional and rational or legal. This differentiation is based on the legitimacy of the power-holder. The work by Matheson nearly a century later includes eight types of domination, including the perspective of both the power holders and the power subjects. The main critique that Matheson introduces to

Weber's work is that democracy and its effects along the XX century are not reflected in Max Weber typology. Matheson reaches new layers of granularity for the study of the polity and society with his revised proposal. From Matheson´s critique of Weber Table 1 above is developed: The table explains visually the eighth types of domination. This would be an eight dimensional view of sources of legitimacy.

Having AI in mind and looking at this framework for the analysis of the cases selected, observations about new sources of legitimacy out of the scope of the table above can be drawn. A first one would be coercion as an instrument for legitimacy. A second source of legitimacy would be AI development outside the umbrella of the state, based in ethics codes. For instance, an applied comparison of national AI strategies in nine countries, including China and the United States finds that national AI strategies have an approach towards AI governance that entails cooperation among the public sector, industry and academia and this has been based largely on ethics [8]. Based on ethics, cooperation is achieved with voluntary mechanisms including best practices, codes of conduct, and guidelines. At the core of a general approach to use ethical guidelines as an efficient measure to prevent or reduce harm caused by AI, the general argument is for its higher flexibility, as opposed to hard regulations that could represent an obstacle to economic and technical innovation [8][9], or other means of legitimacy.

IV. METHOD AS A SOURCE OF CHANGE AND LEGITIMACY

A third source of legitimacy would be linked to method. Matheson's approach to sources of legitimacy reviews Max Weber work making important contributions. But a further contribution is missing: the concept of improved democracies through method as source of legitimacy. This type of legitimacy -experimenting with method, in an active process to reach better results- is not included in Matheson analysis. Method points out to new types of democracies that would not be only based on a popular mandate. Method has been the basis to reach new knowledge following the scientific revolution in Europe. Method, in contrast, has not been explored as such to improve democratic governments. The result is that there has not been an appraisal of method as a way to reach better results in democratic regimes. An example of the dangers and limitations of not including method as a source of improved legitimacy is the work comparing national AI strategies in nine countries, including China and the United States [8], stressing the lack of concrete mechanisms for inclusion of civic society and public engagement in AI control.

These new sources of legitimacy -coercion, ethics, improved method, and legitimation based on algorithms- will be incorporated in the previous table in order to develop a new table, the Gil Dashboard, allowing us to analyze artificial intelligence in case studies, in multilevel analysis and from a comparative perspectives. The sources of

legitimacy are incorporated close to the category that is more akin to the concept, if any. The additions are included in bold text.

TABLE II. THE GIL DASHBOARD: THIRTEEN SOURCES OF LEGITIMACY TO ANALYZE AI

Dimension	Definition of the dimension
Convention	Norms, rules: legal or customary rules that prescribe forms of behavior
Contract as basis of legitimacy	Mutual rights and obligations. The theory of consent as the basis of obligations
Basis of legitimacy in a conformity with universal principles: natural law	Theories of natural law, aka, the existence of a natural order superior to man-made law
Sacredness of authority	Power-holder or his/her norms considered to be sacred divine right of reigns. For Max Weber it could also be an attribute of an office rather than a person
Legitimation by **human** expertise	Technical expertise, in the vein defended by Saint-Simon, Taylorian theories, or historic laws
Legitimation based on an algorithm	**Legitimation based on macrodata –hindering the idea of individual liberty and decisions taken by means of human conversation and persuasion**
A popular mandate in a constitutional democracy	Popular mandate: a claim to democratic election in accordance with constitutional procedures. Based on constitutionalism, power holders elected in accordance with constitutional procedures. Here we find a distinction between populist democracies, where the will of a majority rules, and constitutional democracies, were there will of a majority is limited by a constitution
Improved democracies experimenting with method	**A type of legitimacy based not only in a popular mandate but also on experimenting with method and in a continuous process, in order to reach better results, including accountability**
Regimes -non democracies- developed through method	**A type of legitimacy based on experimenting with method and a continuous process to justify objectives and reached results**
Personal relation	Domination, in which there are close ties between power-holders and power-subjects such as personal authority or paternal authority relationships
Personal quality of the power holder	Domination based on the personal quality of the power holder, by virtue of which he/she can claim a right of command
Coercion	**The use of power to influence someone to do something they do not want to do, from exerting fear to nudging as positive reinforcement**
Societal cooperation, excluding the polity	**Development of mechanisms of cooperation among the public sector, industry and academia: cooperation is achieved with voluntary mechanisms including best practices, ethical codes of conduct, and guidelines**

V. APPLYING THE DASHBOARD TO STUDY GOVERNANCE, LEGITIMACY AND CONTROL: ARTIFICIAL INTELLIGENCE IN CHINA

In this section we analyze sources of legitimacy using the author´s Dashboard in the Chinese case. The work proceeds first of all with a brief introduction on the economic governance of AI in China, followed by Table III, with a quantitative analysis (where 1 is existence and 0 absence), and a qualitative analysis follows. At this stage of the research using a binary code has the sole purpose to state existence or absence of a given dimension. The subsections explain those features that have proved existing. To refine limitations derived from using binary code, this coding could be complemented with normalized scales –i.e. Likert scale- other metrics showing further comparative scalability for each of the dimensions in the Dashboard, coupled with in depth dimension studies.

The baseline of the economic governance of AI in China has laid on the increase of total fiscal expenditures on science and technology rising from 48 per cent in 2007-2011 to 59 per cent in 2015-2016 [13]. Provinces and local governments have significant autonomy in the implementation of these funds, and from different approaches [14]. There are local unbalances in AI development, with three cities being home to 70 per cent of AI firms: Beijing being home to 43 of Chinese firms, Shanghai at 15 per cent and Shenzhen at 12 per cent [15]. Following with expertise, the mode of economic governance has not been based on cutting edge technologies in China. The mode of AI economic governance, instead, has been based in rapid deployment and scaling of existing AI technologies [15]. The results have been fusion and speed over breakthrough technologies, and ensuring the adoption of existing technologies. Adoption and scale have been the formulae for AI implementation, both in the private and the public sector. This is very much in contrast with the case of European countries, where deployment of AI technologies at the local level remains very low [9]. An additional key in economic governance has been the attraction of global and supra-local linkages by ambitious policy makers searching for increased access to capital and other AI ecosystems: Linking to cities such Amsterdam, Barcelona, Stockholm, and clusters forming around Cambridge, Oxford and Manchester –with the AI ecosystem around Manchester university and the United Kingdom government communications headquarter. Another component in economic governance has to do with the objective to reduce policy fragmentation in China. In order to do so, local governments are incentivized to develop plans that can be later used to assess progress and to induce competition between different regions and localities.

TABLE III. THE GIL DASHBOARD: THE GIL DASHBOARD ON SOURCES OF LEGITIMACY AND CONTROL: AN APPLICATION TO CHINA, CONCEPTUAL, QUANTITATIVE ANALYSIS.

Dimension	Quantitative analysis	Definition of the dimension
Convention	1	Norms, rules: legal or customary rules that prescribe forms of behavior
Contract as basis of legitimacy	0	Mutual rights and obligations. The theory of consent as the basis of obligations
Basis of legitimacy in a conformity with universal principles: natural law	1	Theories of natural law, aka, the existence of a natural order superior to man-made law
Sacredness of authority	0	Power-holder or his/her norms considered to be sacred divine right of reigns. For Max Weber it could also be an attribute of an office rather than a person
Legitimation by **human** expertise	1	Technical expertise, in the vein defended by Saint-Simon, Taylorian theories, or historic laws
Legitimation based on an algorithm	**0**	**Legitimation based on macrodata –hindering the idea of individual liberty, or decisions taken by consensus**
A popular mandate in a constitutional democracy	0	Popular mandate: a claim to democratic election in accordance with constitutional procedures. Based on constitutionalism, power holders elected in accordance with constitutional procedures. Here we find a distinction between populist democracies, where the will of a majority rules, and constitutional democracies, were there will of a majority is limited by a constitution
Improved democracies experimenting with method	**0**	**A type of legitimacy based not only in a popular mandate but also on experimenting with method and in a continuous process, in order to reach better results, including accountability**
Regimes -non democracies- developed through method	**1**	**A type of legitimacy based on experimenting with method and a continuous process to justify objectives and reached results**
Personal relation	0	Domination, in which there are close ties between power-holders and power-subjects such as personal authority or paternal authority relationships
Personal quality of the power holder	0	Domination based on the personal quality of the power holder, by virtue of which he/she can claim a right of command
Coercion	**1**	**The use of power to influence someone to do something they do not want to do, from exerting fear to nudging as positive reinforcement**

Dimension	Quantitative analysis	Definition of the dimension
Societal cooperation, excluding the polity	1	Development of mechanisms of cooperation among the public sector, industry and academia: cooperation is achieved with voluntary mechanisms including best practices, ethical codes of conduct, and guidelines

A. Convention

The first source of legitimacy and control that we can draw from this table and apply to the Chinese case is convention. It could be argued that in China there are general changes in convention as a source of legitimacy, understood as norms, rules –legal or customary rules- that prescribe forms of behavior.

The mode of social governance has implications in China's choice of adoption of AI technologies. As Ding states [11], the State Council's AI plan sees AI playing an irreplaceable role in maintaining social stability. In practice, this is reflected in local-level integrations of AI across a broad range of public services, including judicial services, medical care, and public security. Specially affecting the mode of social governance are two areas, the first one, concerning privacy, and the second concerning private companies' participation in social credit systems [16][17]. AI is proved as a good tool to improve efficiency and reach services, however it is a less desirable tool for complex areas where context, emotional judgment, flexibility and moral judgements are crucial.

In the case of the social credit system, Lewis defines it as an initiative based on a cluster of experiments harnessing public data with the aim to improve governance [18]. This improvement seeks to boost trust among government, firms and individuals, and includes larger national efforts - the Blacklist-Redlist Joint Sanctions and Rewards regimes- as well as smaller efforts being implemented in some cities. Lewis defines it as:

"an overarching policy initiative consisting of multiple sub-systems (...) with different policy goals and rules, rather than one distinct system. Ambitiously, it takes aim at nearly all of China's development ills – from environmental protection to IP and financial fraud to academic plagiarism" all of which the Chinese government believes stems from firms and individuals not following laws and regulations" [18].

The intent, according to the Chinese government, would be to enshrine trust in order to develop a market economy [18]. An important loophole, however, is that individuals or firms have little knowledge about the data collected. Lewis recalls that the black list regime has been reinforced and had real implications for business and individuals, but it is difficult to be conclusive about whether policy is truly achieving the general goal of business and individuals behaving in a more trustworthy manner [18], and more generally, whether the system improves trust in Chinese institutions.

General changes in convention as a source of legitimacy, understood as norms, rules –legal or customary rules- that prescribe forms of behavior are the aim of AI scoring systems assigning a credit to the population with the aim, according to the government, to improve societal trust. Xiamen and Fuzhou are two examples of cities that have implemented score systems for their population since 2018. Xiamen has over 85,000 users exchanging their scores to avail services. Fuzhou has over 1,19 million residents doing the same. Scores look at the behavior of residents, and the individual participation such as keeping promises as measure of responsibility and trust, while a breach of contracts would be contemplated as unwillingness to obey the law. A system of credit repair has been invented, with the possibility to gain credit back through active participation in social service, public interest events and welfare activities. These are mechanisms to change traditional convention. Other mechanisms are local scores looking at hard working, observation of ethics and morals, as defined by the government, delayed payment, the follow up of administrative regulations and legal duties. Danit Gal [19] argues that mechanisms of credit scoring exist in other countries such as the United States, however, the level of development and deployment in China makes it unique in scale.

It could be argued that changes in convention and social cooperation affect innovation ecosystems as well. Ding remarks how the central government's important guiding role in China is targeted by other public and private actors, pursuing their own objectives in AI, including academic labs, bureaucratic agencies, private companies and subnational governments [11]. Many actors involved have resulted in rapid innovation in many fields, based in local innovation ecosystems. By the end of 2018, 20 provinces had issued 30 specific AI policies "many forward thinking local governments implemented AI-related policies that preceded national government action" [12]. The pragmatic approach to innovation has resulted in important developments in the fields of healthcare, medical image processing and pharmaceutical research. Kim describes the ecosystem of actors as a hybridized industrial ecosystem including firms, networks of small and medium enterprises and research institutes specially adapted to the local conditions [20]. Ding emphasizes the importance of specializing in AI subdomains, and he actually stresses the importance of specialization in AI subdomains or parts of the value chain as clues to success [11]. Ding also stresses that in a new vein, transparent budget disclosures show allocation to companies in subdomains ranging from predictive analytics of smart city data to sign language translation [12].

An example of a hybridized industrial ecosystem has been the Hangzhou AI Town opening for business in July 2017 –inspired by visits from local leaders to Silicon Valley and searching for similar spillovers. The mission of this local ecosystem has been to link the e-commerce company Alibaba and subsidiaries -with more than 90 per cent of the projects in some categories-, with Zhejiang university, graduates studying overseas, and local businesses together in a cluster. The creation of the AI park is housed in the Hangzhou Future Sci-Tech City, connected to a larger infrastructure of science and technology parks [11]. This local industrial ecosystem has been designed with international linkages in mind, and thus Silicon Valley Bay area council has an office helping Californian companies to register enterprises, and Hangzhou AI Town, in turn, has offered 3 million RMB for settlement expenses, and 15 million RMB in subsidized office space costs [11]. An additional aim for Hangzhou AI Town managers has been attracting talent, such as returning Chinese graduates from international universities [21], but not exclusively Chinese: recent measures restricting the support of development, production, and semiconductor fabrication by United States nationals in China show that global talent attraction was also a key in this local development model [22]. In Hangzhou AI Town, Alibaba functioned as anchor tenant, a necessary condition for AI development success that is also found in other Chinese local ecosystems [11]. Jeffrey Ding also speaks of elite universities, such as Zhejiang University as a glue to hold the ecosystem together, and the existence of large technology firms such as Alibaba as a requirement to enhance productivity and local innovation [11]. The involvement of private actors, however, brings in the risk of inequality [32]. In order to avoid inequalities and the marginalization of social groups, the adoption of AI educational tools has been defended as a need, as well as a source for better comprehension about how innovation may prevent the marginalization of less favored social groups.

B. Contract

We find that the appeal to contractualism is absent as an instrument of legitimacy in China -as the search for related keywords yielded invalid or no significant results.

C. Basic of legitimacy in conformity with a natural law: Ethics as a set of laws

Legitimacy based in a natural law is the following category existing in our quantitative analysis. Legitimacy to set up AI in public services in China has been driven according to Rogier Creemers by the ideological view that social order is governed by an objective and a determined set of laws where AI can solve social problems and help to understand those laws [19]. In this context, AI is generally designed to improve existing institutions, not to replace or reform them, and thus policies integrating AI play an important role. Policies and public-private partnerships are at the center of this short of approach, in which national, local and company levels concur often. Policies focus on speeding up technology development, data collection and implementing pilots. Issues such as accountability, data privacy, and risk management appear to be secondary to crucial developments. We thus find legitimacy based on universal principles, ethics in the case of China is linked to the development of AI outside the umbrella of the state. This result is consistent with the findings of Gianni et al., in an applied comparison of national AI strategies in nine countries, including China and the United States [33] –at least until the summer of 2023, when the Chinese Minister

of Science and Technology shifts policies on generative AI towards regulation. The Chinese case reflects that the source of legitimacy for AI governance entails cooperation among the public sector, industry and academia. This is AI development outside the umbrella of the state, based on ethics codes [31], up to the scope of time covered by this research. In this particular conception of ethics, cooperation is achieved with voluntary mechanisms including best practices, codes of conduct, and guidelines. In general terms, at the core of a general approach to use ethical guidelines as an efficient measure to prevent or reduce harm caused by AI the general argument is for its higher flexibility, as opposed to hard regulations that could represent an obstacle to economic and technical innovation [32][33], or other means of legitimacy.

In China's approach to ethics there is a basis of legitimacy in a conformity with a call to universal principles, where harmony, as principle in Chinese philosophy for all life forms [31] would be relevant in the contexts of human-machine interactions [19]. The call to universal principles making a reference to harmony is furthered in a new document addressing human-machine harmony, and more specifically stating in article n. 1:
"AI development should begin from the objective of enhancing the common well-being of humanity; it should conform to human values, ethics, and morality, promote human-machine harmony, and serve the progress of human civilization; it should be based on the premise of safeguarding societal security and respecting human rights, avoid misuse, and prohibit abuse and malicious application [32, their translation]."

Multi-stakeholder committees have been settled outlining AI ethic principles, many of them according to global standards [33]. An additional challenge is to bring a number of relevant stakeholders into key conversations on AI ethics, both internationally [19] and at the national level. There have been expert groups, including several companies, business associations and expert groups releasing principles, and the New AI Governance Expert Committee, created by the Ministry of Science and Technology, stating that AI should conform to safeguard social security and respecting human rights, according to Creemers [22]. Interpreting this statement would make us close to Chinese Communist Party ideology, which in the aftermath of the 20th National Congress of the Chinese Communist Party closing in 22th October 2022 is driven by a top down hierarchy, with General Secretary Xi Jinping on top, and 90 million Communist Party members: As Xinhua relates, "Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era (...) should be incorporated into the Party Constitution (...) with Comrade Xi Jinping at its core to advancing the Party's theoretical, practical, and institutional innovations." [5][16]

D. Sacredness of authority and improvement of democracy thorough method

Sacredness of authority is absent, as well as improving democracy through method and personal relation

-as the search for related keywords yielded invalid or no significant results.

E. Method as a source of legitimacy

Whereas method is the basis to reach new knowledge following the scientific revolution in Europe, method, in contrast, has not been institutionally embedded as a basic feature to improve democratic -or undemocratic- governments. The result is that there has not been an appraisal of method as a way to reach better social results in democracies [23]. The sources of legitimacy linked to method deserve further elaboration. Matheson's approach to sources of legitimacy reviews Max Weber work making important contributions. However, the search of improved democracies through method as a source of legitimacy is not included in Matheson analysis. This type of legitimacy is based on the active involvement of citizens -or residents- in promoting public values. In this active involvement, there is a need for a process of social construction. This social construction would entail employee participation, citizen involvement, empowerment and consultation at center stage: not just as outcome, but in the dialectical process of construing public institutions and a theory where the emphasis is on the public in the administrative process [24]. This conception of social design includes the general public, the government, and the public administration. Social design would be understood as evolutionary, as an integrative process to build shared realities that could lead to a process of invention, evolution and self-governance [25]. This is what the Dashboard refers to as experimenting with methods and in an active process, not only based on a popular mandate, to reach better results. The work by Gianni et al. comparing national AI strategies in nine countries, including China and the United States stresses the lack of concrete mechanisms for inclusion of civic society and public engagement in AI control [27]. This could be understood as lacking the experimentation with method as a formula to build better shared realities.

In the case of education we could argue AI development in China is experimenting with method as a continuous process, and justifying the reach of better results. However, as Liu argues, high-quality education involves creativity, collaboration and critical thinking, and for those aims, the role of just AI technologies for the next generation of students is limited [42].

F. Basis of legitimacy in conformity with expertise

Pointing at sources of legitimacy and control in China, expertise is the following category in our analysis. Legitimation by expertise is on the basis of economic governance in China. Legitimation by expertise is heavily ingrained in the AI strategic plan designed by the China´s State Council in 2017 [35]. This is also the case in the plan when calling for the development of a whole range of AI related healthcare technologies to put cognitive computing at the service of learning, recalling and appling vast amounts of text works for medical professionals. Expertise as a basis for legitimacy is reported by Karen Hao at The Wall Street Journal:

"Chinese leader Xi Jinping has packed the top ranks of the Communist Party with a new generation of leaders who have experience in aerospace, artificial intelligence and other strategically important areas (…) Chinese officials with technical expertise occupy 81 seats, nearly 40% of the total, in the new Central Committee—the elite body that decides major national policies—according to data compiled by the Washington-based Brookings Institution think tank and shared exclusively with The Wall Street Journal. That compares with less than 18% in the previous Central Committee." [34]

Legitimation by expertise has also been applied to the judiciary: It is the baseline for System 2016, which is Shanghai High People's Court Intelligence assistive case-handling system for criminal cases. The purpose of the system is to improve the quality and reduce false, unjust or wrong changes and sentences [32]. Eugeniu Han explains that the system has two components, a cross reference system using speech recognition to compare different types of evidence and alert the judge about contradictions in the judge patterns [32]. The second component is a sentencing reference tool based on machine learning combining the defendants basic information and a large database of past court records to make sentencing recommendations. The system can also be used to judge the judges and prosecutors by pinpointing the outliers [32], moreover, applications within System 2016 could skew a prosecutor or judge to the detriment of the defendant. Han stresses that defendants and their defenders may lack the technical knowledge, resources and access to challenge AI processes for generating a sentencing reference and assess its potential biases [32]. Gal suggests another loophole since Alibaba is usually the defendant in many cases while is also the co-creator of the Smart Court System 2016: conflicts of interests are clearly at stake, "exacerbating legal accountability for decisions made by using these systems" [19]. Gal pinpoints that the use of AI to support the court system occurs in other countries, what is unique to China is a "smart court and an AI judge handling claims against a corporate actor, while also being developed by the same corporate actor [19].

An additional tool contributing to legitimation by expertise is City Brain, a system first launched for traffic management in Hangzhou in 2016 with the aim of tackling traffic congestion. City Brain was developed by 13 companies together with the city government and based on Alibaba cloud platform service: The firm optimizing traffic has developed into a data coordination center consolidating data from over 700 IT government agencies. This data coordination center offers services for parking, traffic management -including ambulances and firefighters- waste collection and even health monitoring of the city's aging population [32]. With different modifications City Brain has been implemented in more than 10 cities in Asia, sometimes under the umbrella of the Belt and Road initiative of the Digital Silk Road.

Following expertise as a base for legitimacy, in 2018 the Guangzhou Women and Children Medical Centre developed an AI prototype using NLP and deep learning to work with relevant information from 1,4 million patients to help frontline patient care, for instance triaging patients to decide degrees of urgency. Some other examples include AI deep learning to recognize visual symptoms: here researchers have been using AI to scan and diagnose congenital cataracts, where an estimated 200.000 children are bilaterally blind from cataracts annually [33]. In some of the AI developments blockchain technology is used to ensure trust in data stored in the system [33]. Andy Chun explains that Alibaba and Tencent are investing to interpret scans and to detect early signs of cancer [33]. In July 2019 the Chinese startup JF Healthcare -specialized in providing remote diagnosis services for rural town hospitals where radiologists are not available often- was the first to beat Stanford University radiologists. This approach to AI development is based on experimenting and innovating first and it seeks to achieve time to market results in fields as important as medical care [33] Here AI is seen as a possible solution to doctor shortage -China has two practicing doctors for 1000 inhabitants- to scarce medical services in rural areas, and to highly strained services in rural areas due to large patient volumes [33].

G. Coercion

In our Dashboard on sources of legitimacy and control, coercion is the following category existing in quantitative analysis. For the purpose of our model, albeit with a difference, we draw a similarity between coercion and nudging. There is nudging attached to wearable technology, with over 52 per cent of inhabitants in China using this technology able to monitor their health. Insurance companies such as Ping An Health have integrated wearables into their offers to facilitate discounts and rewards to customers sharing data and living healthier lifestyles [33].

China's privacy is at risk by the lack of rights and guarantees [41][35]. This draws a fine line with coercion [43][37][38][39], even though some data privacy efforts have been addressed in laws and regulations [22][40][41]. AI education systems are an example. Chinese AI educational systems have been collecting, storing and analyzing students' facial expressions without regulation [19]. Facial information has been also collected through boards subways, enforced recycling and the obtention of toilet paper in public toilets, raising many public concerns and establishing a culture of pervasive individuals monitoring [19]. There is no limit in government access to and use of private data. At the same time, without transparency of knowledge about how the variables to calculate scores work, the possible divide between low and high scores may increase.

H. Personal relations and personal quality of the power holder

Both traits, personal relations and personal quality of the power holder, are part of the model developed to explain legitimacy and governance of AI. However, for the case of China the author finds that both features lack power to explain AI development, as the search for related keywords yielded invalid or no significant results. Thus,

both features rank as absent in Table III, defining sources of legitimacy and control applied to China.

VI. Conclusion and Future Work

The work presented in this article allows us to unveil a complex reality from the perspective of philosophy, political theory and sociology, where AI brings new rules attached to command, control and governance in general. One of these new rules is human pace in decision making, in contrast to decisions being made quickly, as they are generally in AI frameworks [43]. The article presents the Gil Dashboard to show how AI is mediating problems related to governance and legitimacy. The Dashboard brings to light new ways of thinking in methodological terms and in comparative perspective about artificial intelligence in different political and social settings. The article argues that the theoretical Dashboard is useful to apply in case studies, multilevel analysis and for comparative perspectives; in countries in Asia, western countries and countries in the global south.

Once the Dashboard is presented, it has been applied empirically to the case of China. Firstly, using a binary code with the sole purpose to state existence or absence of the dimension studied. Additionally, with the references and works covered by the author analyzing 170 documents matching the query, the following conclusions are highlighted for this particular case: Researching on convention, a focus on local-level integrations of artificial intelligence across a broad range of public services has been founded, including judicial services, medical care, and public security. The use of AI for these services affect the mode of social governance on privacy, limiting it. The use of AI for services also affects private companies' participation in social credit systems. Artificial intelligence scoring systems are being used to assign credit to the population with the aim, according to the government, to improve societal trust albeit with limited usefulness, and with associated pitfalls linked to privacy. Contractualism has been found absent as an instrument of legitimacy in China. Legitimacy in conformity with a natural law has been found linked to ethics as a set of laws -an appeal that is shared by private companies in western countries as a main resource towards a self legitimation of artificial intelligence use. A broad development of artificial intelligence is found outside the umbrella of the Chinese state, based on ethics codes. In China's approach to ethics, legitimacy is attached to harmony as a principle in Chinese philosophy for all life forms. At the economic level, multi-stakeholder committees have outlined artificial intelligence ethical principles, many of them according to global standards. Both sacredness of authority and improving democracy through method have been found absent as legitimacy resources. In contrast, legitimation by expertise is deeply ingrained on the basis of economic governance in China. Legitimation by expertise is heavily linked to the artificial intelligence strategic plan designed by the China's State Council in 2017, and to subsequent developments: Chinese officials with technical expertise occupy 81 seats, nearly 40% of the total, in the new Central Committee elected in 2023—the elite body that decides major national policies, up from 18% in the previous Central Committee. Legitimation by expertise is also on the basis of the judiciary, with the creation of System 2016, the contentious Shanghai High People's Court Intelligence assistive case-handling system for criminal cases. Finally, artificial intelligence in the form of NLP and deep learning have also been used extensively to work with relevant information from 1,4 million patients to help frontline patient care, including artificial intelligence deep learning to recognize visual symptoms.

Future works may refine limitations derived from using binary code when the Dashboard proposed is applied to particular cases. In order to avoid this limitation, this coding could be complemented with normalized scales –i.e. Likert scale- and other metrics showing further comparative scalability for each of the dimensions in the Dashboard. Future works may also consider the shift of the Chinese government towards regulation of generative AI, with the new policies of the Chinese Minister of Science and Technology in the summer of 2023. This is an important departure from previous hands off policies towards AI regulation. For future works and research, the Gil Dashboard presented may further help to ask relevant questions on challenges in current societies; from uncertainties that countries face against AI development to challenges based on cultural values including those related to democratic realms, and challenges due to the intersection between local values and AI development.

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