Global governance of artificial intelligence –
What role for the European Union
Draft proposal for PhD project, February 2020

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Abstract. The rapid development and roll-out of artificial intelligence (AI) pose new challenges to policymakers and other stakeholders around the globe. This has sparked a frenzy of normative and regulatory measures constituting an emerging governance framework for AI technology. In my thesis, I (1) build on global governance theory to describe and explain the developments in this emerging space. In particular, I explore the role of the European Union (EU) as an actor trying to influence the global governance regime. Through a mixed-methods approach of qualitative process tracing and quantitative analysis based on machine-learning techniques, I aim to (2) shed light on the EU's interactions with the global governance regime on AI and (3) to measure the EU's success in positioning itself as a global rule-maker.

Keywords: International Relations · Global Governance · European Union · Artificial Intelligence.

Table of Contents

1 Introduction

Global governance describes both the political reality of an organisational prin-
ciple in international relations and the academic discipline studying political
phenomena associated with that principle. At its core, global governance is
an acknowledgement of the increasingly multi-polar and complex nature of in-
ternational affairs (Sinclair 2012), a trend driven by the emergence of a post-
Westphalian, post-colonial and post-hegemonic world order. It is especially useful
for analysing contemporary international politics because its theories allow for a
variety of actors, from states to formal and informal international organisations,
to private agents (multinational corporations, NGOs, citizens' movements, ...),
to interact at a multitude of levels in different fora.

1.1 Global governance of AI

Global governance has originally been applied to policy issues such as the global
financial system, climate change, trade, or security, where frameworks are there-
fore quite developed and relatively well understood. Global policy challenges in-
duced by technological change and innovation have often been covered by one of
those categories. However, with the accelerating development of what is broadly

understood as artificial intelligence (AI),[3] a new set of challenges arises that may well merit its own global governance framework. And indeed, the last few years seem to have witnessed an outburst of AI-related regulatory and diplomatic action in the international arena, from high-level political declarations to civil society input, coupled with a growing interest by international relations scholars. This gave rise to an increasingly complex global governance regime (see Figure 1 for a preliminary approximation visualising some of the most relevant actors and actions regarding global governance of AI).

Thus, a fundamental part of this work will be to more systematically look at the actors, institutions, and mechanisms that shape the global governance of AI, with the two-fold aim of (a) *exploring whether indeed a dedicated framework for global governance of AI is emerging* and (b) *mapping said framework*. In other words: **What does global governance of AI look like?**

Based on this foundational, theory-driven and descriptive part of the project, the next step of my research will be to investigate the European Union's (EU) role therein. My focus on the EU is motivated by the hypothesis that emerging technologies such as AI provide new spaces for the EU to establish itself as a global actor, which serves the double objective of generating legitimacy abroad as well as vis-à-vis the EU's Member States. I will develop this argument further by looking at the EU's involvement in AI-related global policy-making through the G7, G20, OECD, or other international organisations, as well as its use of available foreign policy tools such as trade agreements or issue-based bi- and multilateral negotiations.

This will provide answers to questions such as *which fora and channels does the EU participate in*; *which policy instruments or other diplomatic means are employed by the EU to shape the global governance framework*; *are these actions Brussels-driven or requested by the Member States?* In other words: **How can the EU's role in global governance of AI be described and explained?**

In the last part of my thesis, I will attempt to measure the extent to which the EU can claim to be a rule-maker in the global governance of AI. Using the EU's Ethics Guidelines, published in April 2019, as a reference point and soft-power tool for discursive influence, I will employ machine-learning techniques to compute similarity scores of AI guidelines released by other stakeholders. This will allow for quantitative analyses that can answer questions such as *To what extent can the EU influence global discourse on AI ethics?* or *which stakeholders are more likely to follow the EU's approach to AI ethics?*. In other words: **Does the EU act as a rule-maker or rule-taker in the global governance of AI?**

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[3] There exists no widely-agreed definition of artificial intelligence, partly because the rapid technological advances constantly change the meaning of the term. Within this research project, I will employ a broad definition of AI and closely equivalent terms, following the groundbreaking research of Fjeld et al. 2020.

Roughly, I define AI as digital systems or machines that pursue a predefined goal through autonomous actions that would otherwise require some sort of human intelligence.
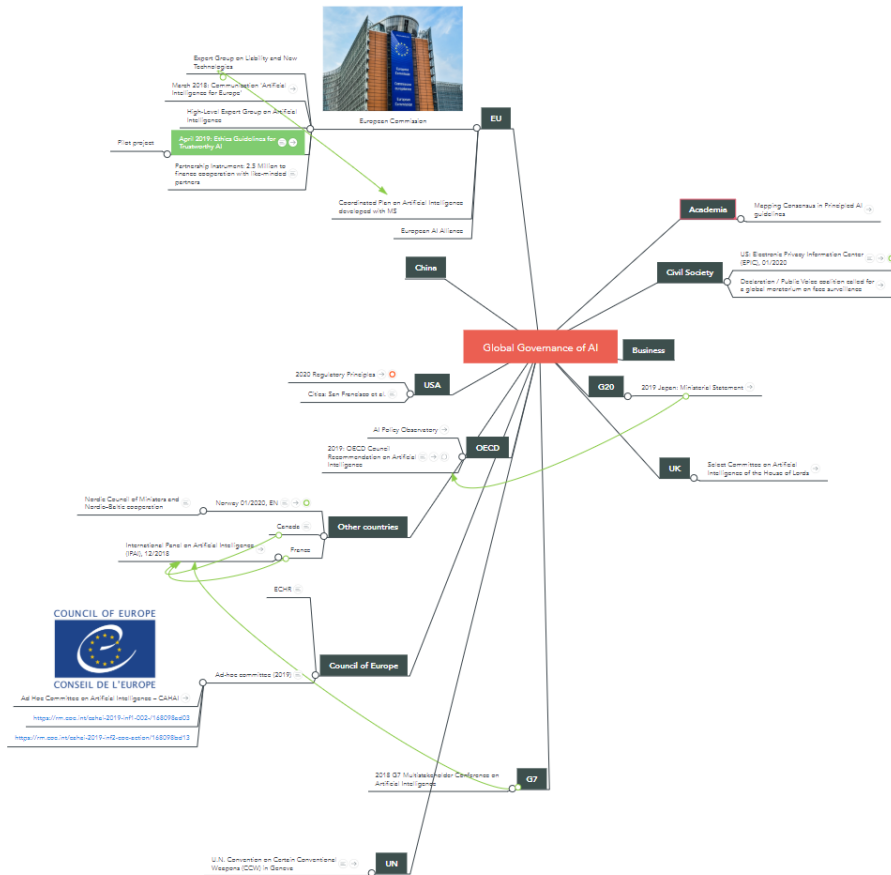
Fig. 1: Snapshot of the global governance regime for AI by late 2019.
Source: Own elaboration.

1.2 Why it matters? It's geopolitics, stupid!

This is relevant not only for policy-makers and practitioners seeking to improve their understanding of the EU's functioning in a major policy field of the future; it also feeds into a growing body of global governance literature; lastly, it will help to inform those that study the EU and other international organizations as actors in their own right – rather than merely a representation of aggregated preferences by their individual members (Barnett and Finnemore 1999). Thus, my findings will support or challenge the argument that the EU's executive (the European Commission, hereafter called "the Commission") is increasingly taking over qualities such as agency – long thought to be a prerogative of nation-states in the international arena.[4]

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[4] While the EU is a unique vehicle in international relations, the literature has, by and large, accepted its role as a foreign policy actor, see Richard and Van Hamme (Bretherton, Vogler, 1999; Smalltown, 2002; Smith, 2003; Helly Smalltown, 2005).

Political leaders at the EU level have actively promoted this narrative of a 'geopolitical Commission'.[5] And indeed, new technologies have served as example for areas in which the EU would act as a rule-maker (rather than a rule-taker) on the international scene: Following the introduction of the General Data Protection Regulation (GDPR) in 2018, which observers describe as landmark legislation with truly global reach, the vision of the EU as a "normative superpower" gained traction in Brussels and beyond. Indeed, the case of GDPR, which mainly addresses challenges related to online privacy, seems to support such a notion: While the law's extraterritorial applicability is only secondary, it has implications that go far beyond the European Union territory. Being a first mover in this emerging field, the EU has managed to shape the international discourse and positioned itself firmly in the global governance of online privacy, setting standards and incentivising other jurisdictions to draw up their own regulations.

In the context of increasing great power rivalry between the technological front-runners China and USA, and encouraged by the positive experience of the GDPR, EU policy-makers began to embrace the idea that the EU could brand and promote a 'third way' to the development and deployment of new technologies such as AI. This third-way approach – usually labeled *trustworthy* (Artificial Intelligence 2019 or *human-centric* (Commission 2019 AI – is usually connoted with normative values such as transparency, responsibility, accountability and ethics, and contrasted to the American and Chinese approaches, which allegedly put too few constraints on the private or public sector, respectively.

The third-way narrative may sound appealing for many reasons, but it is still unclear to what extent it is actually backed by the evidence. Research assessing the EU's impact in global governance of new technologies is scarce. While my mainly qualitative discussion of the EU's role in global governance of AI might shed some light on this question, I plan to complement it with a quantitative analysis (see Methodology section). This will allow me, in the last part of the thesis, to validate or falsify the impact of the previously identified actions based on a very concrete and in-depth case study.

Hence, this thesis will be structured around a three-step model, following the logic of a cumulative doctoral thesis. I begin with theorizing and analysing the existence (or absence) of a global governance framework for AI. I then explore the EU's role in said framework, before ultimately testing the impact of said role by means of an in-depth quantitative assessment.

Whether the EU acts as an autonomous supranational entity or rather expresses the sum of Member States' preferences will also be part of the analysis.

[5] Most recently, the European Commission President-elect Ursula von der Leyen, when she presented her policy proposals and objectives to the public on 10 September 2019, stressing that she wants 'a geopolitical Commission': `https://ec.europa.eu/commission/presscorner/detail/en/IP_19_5542`.

Her predecessor Jean-Claude Juncker used similar language throughout his term, talking repeatedly about the need to strengthen the EU's *Weltpolitikfähigkeit* (best translated as the capacity to play a role in shaping global affairs).

2   Provisional structure

At this point, I envision the final thesis project to have the following structure:

1. **Introduction**
2. **Part (I) Mapping the global governance framework for AI**
   (1) Introduction
   (2) Literature review
   (3) Methodology
   (4) Findings
   (5) Discussion
3. **Part (II) Tracking the EU's involvement in global governance of AI**
   (1) Introduction
   (2) Theoretical Framework (built on Part I) and literature review
   (3) Methodology
   (4) Findings
   (5) Discussion
4. **Part (III) Measuring the global impact of the EU's AI guidelines**
   (1) Introduction
   (2) Theoretical framework (built on Part I + II) and literature review
   (3) Methodology
   (4) Findings
   (5) Discussion
5. **Synthesis and overall discussion of the findings**

3   Research questions

The structure of the thesis described above leads me to the following three main research questions and corresponding elements of the overarching theoretical model:

(1) Is a global governance framework for AI emerging? If so, what does it look like? → *Defining the dependent variable*
(2) Does the EU participate in the global governance of AI? If so, how and why? → *Defining the independent variable*
(3) To what extent does the EU act as a rule-maker (vs rule-taker) in the global governance of AI? → *Searching for their relationship*

These are a mix of descriptive and analytical questions, and answers to both will provide contributions to the scholarly literature, since this is a very nascent field (see next section). They are also policy-relevant, since the question of AI governance – especially at a global level – is still quite under-explored and will presumably only grow in importance over the next years.

4 Literature review and contributions thereto

My research will be situated at the nexus of several academic literatures. To visualise this, consider figure 1 *(is something like this helpful or actually just confusing? If I keep it, I should align the following sub-sections to the graph.)*
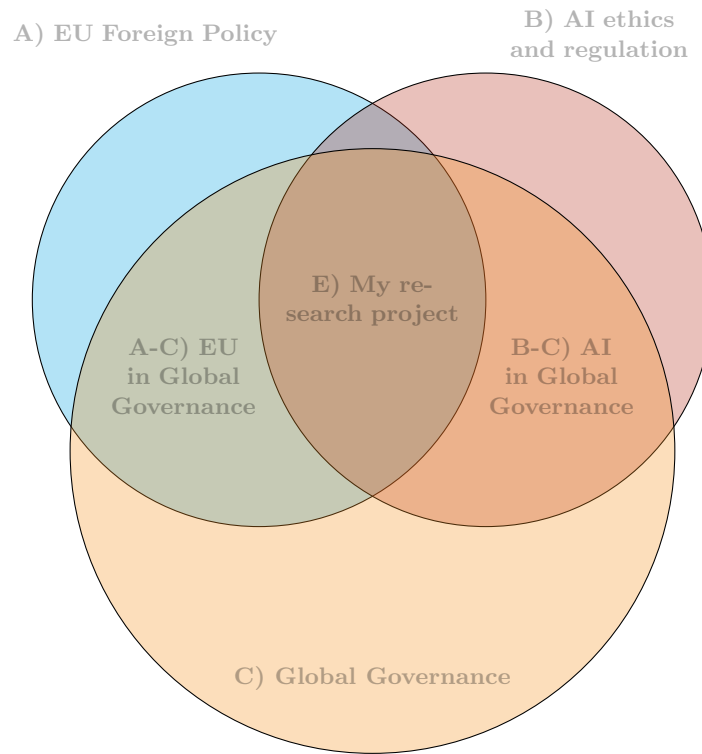

Fig. 2: Relationship of different academic literatures relevant to my research
Source: Own elaboration.

4.1 Global governance literature

Global governance is a relatively young field within international relations scholarship, but there is already an abundance of related literature. A good account of the historical developments of global governance as an academic field and as an organising principle in international relations theory can be found in Sinclair (Sinclair 2012), who tracks it back to the groundbreaking work of Rosenau's 'Governance without Government' (Rosenau and Czempiel 1992). He describes global governance as "systems of rule at all levels of human activity – from the family to the international organization – in which the pursuit of goals through the exercise of control has transnational repercussions."

Many contemporary scholars on global governance are more concerned about questions of authority. For example, Michael Zürn writes in 'A Theory of Global

Governance' that "global governance refers to the exercise of authority across national borders as well as consented norms and rules beyond the nation state, both of them justified with reference to common goods or transnational problems" (Zürn 2018).

In any case, most scholars agree that a key distinguishing feature of global governance is that it acknowledges a plurality of actors, both private and public, state and non-state, who engage at multiple levels and through their interactions define the global order. In this view, the term 'global' is a clear delineation from traditional international relations literature, which are thought of as too state-centric. Likewise, 'governance' stands in contrast to government and thus applies to a wider range of actors and a more fluid (or fully agnostic, see Hooghe, Marks, Lenz, et al. 2017) understanding of power hierarchies.

In developing a conceptual framework for and mapping of global governance of AI, I will draw mostly on the theoretical orientation and concept definitions offered by Zürn. In addition, Hooghe & Marks provide useful conceptual treatments of power relations in global governance, such as rule-makers, -takers or hard and soft rule (Hooghe, Marks, and Hooghe 2016).

Amongst the relatively recent global governance literature, different schools of thought exist in parallel, such as institutionalism, transnationalism, or structuralism. As these are not necessarily opposing, it is tempting to cherry-pick the most convincing elements from each and combine them in a coherent theory that is best suited to explain the global governance dynamics I want to study. For instance, my understanding of the EU is firmly rooted in institutionalism, but I also see merit in the transnationalist approach towards international politics, which assumes the existence and role of noninstitutional transnational entities such as social movements, NGOs and multinational corporations (Klotz 2002). Furthermore, structuralism and neo-Gramscian thought add valuable insights as regards global power relations and the important role of ideas (Cox and Sinclair 1996).

Lately, reflections on global governance theory have led to the construction of a child or successor concept: planetary governance, which according to its original proponent should "help rethink how the objects and priorities of governance should change – towards more democratic and socially just forms of planetary governance" (Gill 2019). This may sound appealing, but I believe that at this stage, this reframing stands more for normative advocacy than analytical precision, so for the moment, I would refrain from employing that term.

4.2   The EU in global governance literature

In addition to the more general global governance literature, there is a smaller body of research specifically focusing on the EU's role therein. Horizontal work has studied this from a legal perspective (Vooren, Blockmans, and Wouters 2013) and also in more multidisciplinary fashion (Wouters et al. 2015). Other research has focused on the EU's interactions vis-à-vis particular countries (Wouters 2012).

Furthermore, the role of the EU in global governance has been extensively studied for a number of sectors or policy issues (Dee 2015; Telò 2009; Wunderlich 2011). However, to my knowledge, no such work exists on the particular angle of AI governance that this thesis will focus on. Given the EU's self-proclaimed role as a 'normative superpower' on new technologies such as AI, but also the many references that AI documents around the world are making to the EU,[6] In light of this, the gap in the literature is surprising.

On the impact assessment or measurement of the effectiveness of EU foreign policy in global governance, the book 'EU policies in a global perspective: shaping or taking international regimes?' (Falkner and Müller 2015) provides a helpful blueprint. But again, the literature seems to be scarce, especially when it comes to the quantification of the EU's global influence.

4.3   AI and global governance

In light of the increasing importance of technological developments for international relations or global governance questions, some researchers have challenged the discipline for its slow response to the conceptual challenges that this causes (Martins 2019). Indeed, it is in this intersection where I hope to make a major contribution to the literature by filling a looming gap.

To the best of my knowledge, there are to date only sporadic research initiatives to address this gap. These include work from the United Nations University (Pauwels and Cockayne 2018) and its distinguished Centre for Policy Research, which has a dedicated AI and Global Governance platform, where think-pieces by scholars and policymakers are discussing the topic from various angles.

Two recent papers stand out for applying document-based analysis similar to the one I plan to perform for the third part of my project. First, in 2019, Jobin, Ienca, and Vayena 2019 mapped the global landscape of existing ethics guidelines for AI and then analysed "whether a global convergence is emerging regarding both the principles for ethical AI and the suggestions regarding its realization." Their results "reveal a global convergence emerging around five ethical principles (transparency, justice and fairness, non-maleficence, responsibility and privacy), with substantive divergence in relation to how these principles are interpreted, why they are deemed important, what issue, domain or actors they pertain to, and how they should be implemented." Similarly, in their 2020 article "Mapping Consensus in Ethical and Rights-based Approaches to Principles for AI" analysed the contents of 36 selected AI "principles documents" (basically ethical guidelines for the development and deployment of AI), establishing "thematic trends that suggest the earliest emergence of sectoral norms." These norms, cov-

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[6] For example, the government of Norway in its recently released 'National Strategy for Artificial Intelligence' explicitly spells out that it "will adopt these [the European Commission's] principles as its basis for responsible development and use of artificial intelligence in Norway." Norway 2020. Similarly, one of the leading privacy groups in the US issued a call to the US administration to ban facial recognition, referring to the EU's ethical principles.EPIC 2020

ered by eight key themes, show some initial alignment with, but also noteworthy differences from, the European Commission's approach.

Arguably, the recent publications of such sophisticated research projects reconfirm the validity and relevance of my own research design. Notably, I do not believe that it undermines the potential contribution of my own investigation, since their studies differ in three significant ways: (a) Methodology: Instead of machine-learning, they hand-coded the documents. (b) Scope: They used a rather narrow definition of relevant texts, which left them with 36 "principles documents", whereas I hope to cover a much larger sample. (c) Focus: Both papers are concerned with global convergence or alignment, whereas I plan to compare the evolution of principles to a baseline document.

4.4   EU and Global Governance of AI

Lastly, there exists little literature on the exact angle of the role of the EU in global governance of AI. Given the EU's focus on the technology,[7] and its clear transboundary character. Accordingly, I hope that my research will help bring to light some novel and interesting findings. However, I will not work in an intellectual vacuum, as there is indeed a nascent, but still limited, literature on the specific angle of EU foreign policy and AI, albeit without the explicit conceptual references to global governance theory.

While a number of think tanks and other non-academic entities have published on the topic (e.g., Daly et al. 2019), peer-reviewed articles are much rarer.

Most recently, Barbé and Badell (Barbé and Badell 2020) look at the EU's foreign policy in relation to one specific application of AI, namely lethal autonomous weapons systems. They focus on the process of norm emergence at the UN and EU level and find that the EU and its Member States have exercised considerable influence in the shaping of global norms. As they conclude, "soft contestation at the UN level has allowed the EU to fill a void in such a way as to bolster its legitimacy as an actor in global governance."

5   Methodology

I plan to employ different research methods for the different parts of the thesis project. Hence, I foresee to have dedicated methods chapters for each of them. Nevertheless, I present below an integrated account of my mixed-methods research plan.

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[7] AI was explicitly mentioned by Von der Leyen in her "agenda for Europe", the political programme which she presented to the European Parliament before she got elected President of the European Commission. See `https://ec.europa.eu/commission/sites/beta-political/files/political-guidelines-next-commission_en.pdf`. The Commission also has presented a number of AI-related initiatives and proposals, as well as awarding several billion euro of funding for research and development on AI.

A major part of the fundamental, theory-related work on global governance in AI will be descriptive, whereas explanatory work will mainly be found in the chapters explaining the EU's engagement with global governance, and in the ones assessing its impact. Essentially, then, the research design can be characterised as follows: (1) theory development and descriptive research for a global governance framework for AI; (2) a qualitative, thick within-case study of how one particular actor – the EU – engages in said framework; (3) a quantitative, text-based machine learning analysis to measure the EU's influence as regards the global governance of AI.

While I will thrive for high internal validity of my findings, I also want to discuss the scope to which my findings can be generalized. External validity would then relate to the extent to which the observed and explained behaviour of the EU is relatable to the global governance of other policy fields or technologies beyond AI. The findings from the different parts of the thesis will relate to each other, which should ideally also augment their overall validity.

5.1   Qualitative

For the descriptive parts, I will for the most part rely on primary document analysis[8] as well as semi-structured interviews with EU officials and other relevant policymakers. Expert interviews are popular in the field of EU studies, for they allow to examine information that is usually difficult to access with other research methods. They also provide the researcher with better insights into processes, group behaviour and organisational issues. Possible shortcomings are interviewees' biases, sample biases, and an overestimation of human agency and determinism in understanding political affairs. Hence, careful interpretation and contextualisation of the interview results will be a crucial step.

Through document analysis and expert interviews, I will identify the key actors involved in the global governance of AI. I will describe their role and actions, as well as placing them within the governance regime, i.e. in relation to other actors, looking in particular at issue areas and levels of involvement, and engagement with other stakeholders. I also hope to get a sense of the hierarchy between different actors, fora, and issue areas.

Moving from the descriptive to the explanatory elements of the EU's role within said framework, I will focus on methodologies associated with Foreign Policy Analysis (Alden and Aran 2017, Jackson and Sørensen 2017, Morin and Paquin 2018), which covers models of analysis such as bureaucratic politics and process tracing. Organisational process tracing (Barnett and Finnemore 1999) is an approach that "attempts to identify the intervening causal process – the causal chain and causal mechanism – between an independent variable (or variables) and the outcome of the dependent variable" (George and Bennett 2005). I hope that this will allow me to understand why the EU is taking action in certain areas, whether this mandate comes from the Member States or is an

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[8] These could be official government communications, legal texts, and other output such as briefings published by international organisations, experts or academics.

autonomous initiative from the EU executive, what this action looks like, how the EU interacts with other global governance stakeholders, and whether all of this is evolving over time.

In addressing these questions, I expect to have to resort to a mix of inductive and deductive process tracing, for while there exist prior knowledge and theories explaining the EU's global engagement as such, less work has been carried out on the particular angle I am interested in. I also assume that the object of study is subject to many changes, so it might be more fruitful to study those changes than to approximate any arbitrarily chosen fixed state.

5.2   Quantitative

As I wrote above, empirical research within the field of EU studies is heavily dominated by interview-based and document analysis, which can be problematic for a number of reasons (Schulz 2019). To counter this trend, and to increase the validity of my findings, I will complement the qualitative parts with quantitative analysis on the diffusion of the EU's norms for ethical AI development, which I consider a proxy for EU soft power.

For that, I plan to conduct content/text analysis (e.g. Harvard's ReadMe or a global alignment algorithm) to compare lexical and, if possible, semantic similarity of AI guidelines around the world with the European Commission's official 'Ethics Guidelines for Trustworthy AI' (High-Level Expert Group on Artificial Intelligence, 2019). My hypothesis which motivates this research is that texts converge over time to the principles put forward by the European Commission, which would support the argument that the EU has discursive or norm-setting powers.

Most existing literature focuses on AI ethics, i.e., the rules and norms that should guide the development and application of AI-based technologies. These AI ethics are currently formulated and discussed by various stakeholders, from governments developing national AI strategies to businesses outlining their vision for AI to NGOs concerned with potential human rights issues or other malign consequences of AI.

There are a number of useful resources attempting to gather such AI ethics documents:

1. A recent study by Jobin et al., who have collected 84 documents containing soft laws or non-legal norms for AI ethics (Jobin, Ienca, and Vayena 2019);
2. the 'AI Ethics Guidelines Global Inventory' by Algorithm Watch, which aims to list all ethical frameworks and principles being developed across the globe, from companies, governments, NGOs and research bodies;
3. the 'Overview of ethics codes and principles for AI' by the *Rathenau Instituut*, which collects prominent statements, declarations, guidelines, and codes regarding ethics and AI, both in the EU and the US;
4. and the list of 'AI policy initiatives' by the European Union Agency for Fundamental Rights, which has collected 180 AI-related policy initiatives in EU Member States in the period 2016-2019, and thus can serve as a benchmark when controlling for spurious correlation.

Since I intend to use such AI guidelines as observations for my empirical analysis, and since they arguably constitute an important element of the emerging governance regime, I began aggregating them in a database and collecting additional ones.

At this point, my collection covers over 150 documents. Figure 3 shows the evolution over time for those 87 documents that I have already labelled with a publication date. The selection criteria at this point are rather inclusive, but I foresee a refined and more restricted definition as I move forward with the analysis. Likewise, I will explain in more detail the process of data collection, which draws heavily on existing inventories such as **ethics**; Jobin, Ienca, and Vayena 2019; Fjeld et al. 2020; *AI Ethics Guidelines Global Inventory* 2019 and additional desk research.
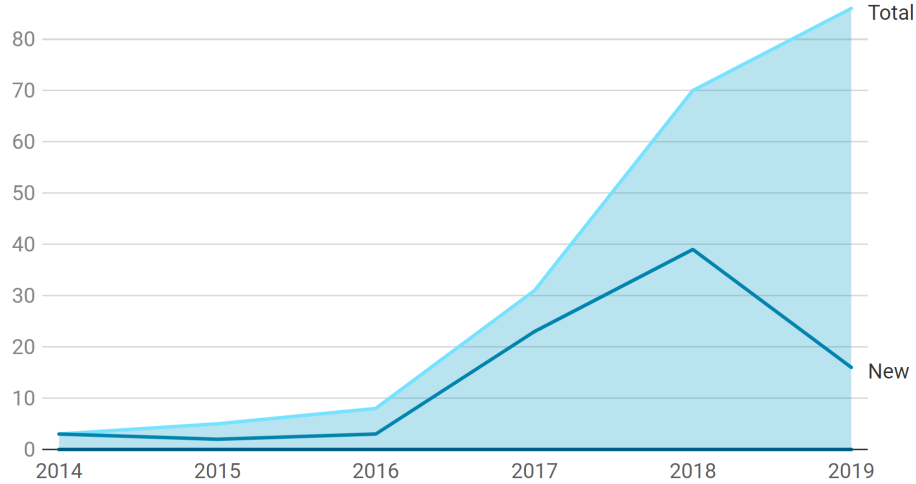

Fig. 3: Proliferation of AI guidelines collected in my database.
Source: Own elaboration.

To predict the similarity of a document Y_i to the EU's Ethics Guidelines for Trustworthy AI Y_0, I plan to employ text-as-data machine learning techniques. While still short of a fully-fledged research plan, I outline below some of the key steps and initial ideas related to this undertaking.

Using Python and R's *scikit* package, I will first clean up the documents through tokenization, the removal of stop words, numbers and punctuation. This will be followed by stemming and/or lemmatization (reducing words to a root by removing inflection/dropping unnecessary characters such as suffixes). Lastly, I will create a data-feature-matrix (word bag) or – if feasible – even more advanced vectoring techniques.

At this point, I plan to first employ an unsupervised learning algorithm to discover key topics and cross-validate those through comparison with human-coded results as presented by Jobin, Ienca, and Vayena 2019 and Fjeld et al. 2020. Assuming that the machine learning model produces similar results (com-

puted through, e.g., the Kahrendorff alpha), this would give validity to the applicability of machine learning models to my data more generally, thus justifying the following steps of my analysis.

As a next step, I would run a text-alignment algorithm to quantify both global text alignment as well as the similarity between the EU's 'Ethics Guidelines for Trustworthy AI' Y_0 and guideline Y_i. This will give me two normalised scores for each of the guidelines. With those scores, I hope to answer questions such as "Are they converging over time?" or "Can closeness to the EU regulatory regime explain variation?" or "Are civil society actors more like to follow the EU's normative discourse?" For this, I will start with a multiple linear regression model.

A draft operationalisation of this model could be:

1. A dependent variable Y: text similarity between the EU's 'Ethics Guidelines for Trustworthy AI' Y_0 and guideline Y_i
2. Treatment group: Those documents published after the EU guidelines
3. Control group: Those documents published before the EU guidelines
4. Independent variables: A dummy for before or after 08/04/2019 (publication of the EU's Ethics Guidelines, closeness to EU regulatory regime; type of author (nation-state, civil society, business), ...
5. Controls: socio-economic development levels, general alignment trends, ...

$$
\begin{aligned}
Y_i = \beta_0 &+ \beta_1 \text{Dummy}_i \\
&+ \beta_2 \text{Closeness}_i \\
&+ \beta_3 \text{Authortype}_i \\
&+ \beta_{4,5,\ldots} \text{Control}4, 5, \ldots_i \\
+\epsilon_i
\end{aligned}
$$

As the last step, I will try to show the impact of the EU's Ethics Guidelines by comparing the predictive performance of machine-learning classification models to a simple regression of *global similarity* over time. The intuition is that if machine learning models outperform the regression, there is a substantive change in the content of AI guidelines that exceeds the temporal trend and can be attributed to the release of the AI Ethics Guidelines.

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