ETHICS AND GOVERNANCE OF AI AND ROBOTICS

A SURVEY AND SAMPLING OF ACADEMIC ARTICLES AND "POPULAR" NEWS AND MEDIA

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Ethics and Governance of AI and Robotics: A Survey and Sampling of Academic Articles and "Popular" News and Media is the result of a search for English language academic articles and recent United States popular media pieces regarding the public perception of AI & Robotics, with the objectives of providing, if possible, an overview of:

- academic discourse on the ethical aspects of AI & R in the United States, deemphasizing solely or specifically legal aspects;
- academic media studies of AI & R in the United States;
- what ethical, legal and social impact issues are raised in United States popular media regarding AI&R, including breaking out the arguably largest or most important national news publication.

This document and its counterparts were produced in 2018 as a contribution to the SIENNA project, an international EU-based consortium dedicated to examining and addressing ethical issues in three new and emerging technology areas: human genomics, human enhancement and human-machine interaction. This third track, which examines the ethics and governance of both artificial intelligence and robotics, ("AI&R") overlapped with work being done as part of the Berkman Klein Center for Internet & Society's Ethics and Governance of Artificial Intelligence Initiative, and that connection offered the Center a chance to contribute to a larger multinational effort. Berkman Klein joined the SIENNA consortium as an associate partner focusing solely on the artificial intelligence and robotics research track. Chris Bavitz and Adam Holland formed the core of the BKC term working on SIENNA materials, with key support during summer 2018 from intern Andrea Nishi.

Other SIENNA partner organizations span the globe and include University of Twente (Netherlands), Trilateral Research (United Kingdom), Uppsala University (Sweden), Helsinki Foundation for Human Rights (Poland), European Network of Research Ethics Committees (Germany), University of Granada (Spain), Ionian University (Greece), Federal University of Rio de Janeiro (Brazil), Dalian University of Technology (China), University of Maastricht (Netherlands), and the University of Cape Town (South Africa).

Each consortium partner produced three related and country-specific reports: a survey and legal analysis of existing relevant law and regulations; a survey and sampling of existing and relevant ethical codes, and a survey and sampling of on-point academic articles and recent more "popular" news and media. The SIENNA core team then synthesized these into a larger report, and also produced a "state of the art" review of the state of artificial intelligence and robotics generally. Adam Holland also participated in SIENNA consortium workshops in the fall of 2018 and 2019.

The main SIENNA website can be found here.

To learn more at Berkman Klein's involvement in the SIENNA project, and additional resources from this work, please visit https://cyber.harvard.edu/story/2021-02/ethics-and-governance-ai-and-robotics.

Report for T4.4 country study of: **United States of America**

Contact person: **Adam Holland**

Contact email: **aholland@law.harvard.edu**

TABLE 1: Basic information on the country study

Please fill in your information in the table below.

Basic information on the T4.4 country study of United States of America	
Main author(s) of this report	Adam Holland
Author's organisation	Berkman Klein Center for Internet & Society
Contributor(s)	Adam Holland, Chris Bavitz
Language(s) used to conduct the study	English

TABLE 2 – All relevant academic articles found during search

[A title in bold text means the document is available in Sharepoint; "** denotes an article that is "not an academic article in the strictest sense of the word, but rather can be seen as academic article according to a wider definition that also includes reports from government agencies/institutes, think-tanks and advisory organizations that are academically rigorous (i.e. contribute to the academic debate via interaction through standard citation formats)."

List of academic articles on the ethics of artificial intelligence and robotics in United States of America				
Articles focusing mostly on artificial intelligence				
Nr.	**Author(s)**	**Year**	**Title**	**URL**
1	Goodall, Noah J.	2014	"Ethical Decision Making during Automated Vehicle Crashes"; (2014)	https://journals.sagepub.com/doi/abs/10.3141/2424-07
2	Russell, Stuart; Hauert,Sabine; Altman, Russ; Veloso, Manuela	2015	**"Ethics of artificial intelligence"**	https://www.nature.com/polopoly_fs/1.17611!/menu/main/topColumns/topLeftColumn/pdf/521415a.pdf?origin=ppub
3	Anderson, Susan Leigh; Anderson, Michael	2007	**"Machine Ethics: Creating an Ethical Intelligent Agent"**	https://www.aaai.org/ojs/index.php/aimagazine/article/view/2065
4	Arkin, Ronald	2008	**"Governing lethal behavior: embedding ethics in a hybrid**	https://dl.acm.org/citation.cfm?id=1349839

			deliberative/reactive robot architecture”	
5	Lin, Patrick; Abney, Keith, Bekey, George	2011	**”Robot ethics: Mapping the issues for a mechanized world”**	https://www.sciencedirect.com/science/article/pii/S0004370211000178
6	Wong, Tien Yin; Bressler, Neil M.	2016	**”Artificial Intelligence With Deep Learning Technology Looks Into Diabetic Retinopathy Screening”**	https://jamanetwork.com/journals/jama/article-abstract/2588762
7	Culver, Kathleen Bartzen	2014	**”RoboWarfare: can robots be more ethical than humans on the battlefield?”**	https://link.springer.com/article/10.1007/s10676-010-9241-7
8	McGee, Ellen M.	2007	**“Should There Be a Law - Brain Chips: Ethical and Policy Issues”**	https://heinonline.org/HOL/Page?handle=hein.journals/tmclr24&collection=journals&id=87&startid=87&endid=104
9	Maguire, G. Q. Jr.; McGee, Ellen M.	2012	”Implantable Brain Chips? Time for Debate”	https://onlinelibrary.wiley.com/doi/pdf/10.2307/3528533
10	Cath, Corinne; Wachter,	2018	**“Artificial Intelligence and the ‘Good Society’: the**	https://link.springer.com/article/10.1007/s11948-017-9901-7

	Sandra; Mittelstadt; Brent; Taddeo; Mariarosaria; Floridi, Luciano		**US, EU, and UK approach"**	
11	Ezrachi, Ariel; Stucke, Maurice E.	2017	**"Artificial Intelligence & Collusion: When Computers Inhibit Competition"**	https://heinonline.org/HOL/Page?handle=hein.journals/unilllr2017&id=1816&collection=journals&index=
12	Pesapani, Filippo; Volonté, Caterina; Codari, Marina; Sardanelli; Francesco	2018	**"Artificial intelligence as a medical device in radiology: ethical and regulatory issues in Europe and the United States"**	https://insightsimaging.springeropen.com/track/pdf/10.1007/s13244-018-0645-y
13	Whitman, Michael E.; Townsend, Anthony M.; Hendrickson, Anthony R.	1999	"**Cross-national Differences in Computer-Use Ethics: A Nine-country Study"**	https://link.springer.com/content/pdf/10.1057%2Fpalgrave.jibs.8490833.pdf

14	Dennis P. Wall, Rebecca Dally, Rhiannon Luyster,Jae-Yoon Jung, Todd F. DeLuca	2011	**”Use of Artificial Intelligence to Shorten the Behavioral Diagnosis of Autism”**	https://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0043855&type=printable
15	Calo, Ryan	2017	**”Artificial Intelligence Policy: A Primer and Roadmap”**	https://heinonline.org/HOL/LandingPage?handle=hein.journals/davlr51&div=18&id=&page=
16	Anderson, Susan Leigh; Anderson, Michael	2015	**”**Toward ensuring ethical behavior from autonomous systems: a case-supported principle-based paradigm”	https://www.emeraldinsight.com/doi/pdfplus/10.1108/IR-12-2014-0434
17	Steven E. Dilsizian, Eliot L. Siege	2013	**”Artificial Intelligence in Medicine and Cardiac Imaging: Harnessing Big Data and Advanced Computing to Provide Personalized Medical Diagnosis and Treatment”**	https://link.springer.com/article/10.1007%2Fs11886-013-0441-8

18	Banavar, Guruduth	2016	**“Learning to trust artificial intelligence systems accountability, compliance and ethics in the age of smart machines”** **	https://www.alain-bensoussan.com/wp-content/uploads/2017/06/34348524.pdf
19	Sharkey, Noel	2010	**“Saying ‘No!’ to Lethal Autonomous Targeting”**	https://www.tandfonline.com/doi/abs/10.1080/15027570.2010.537903?casa_token=sK_RSv2gNz8AAAAA%3AhEe1DwJAjMsPW6cRqgOoGN4eHU4_gTPsSqLpb-b30OayrTubMrXWXn3T_dq4GhFceu5UCPy4IaA&
Articles focusing mostly on robotics				
Nr.	**Author(s)**	**Year**	**Title**	**URL**
1	Arkin, Ronald	1970	*Governing Lethal Behavior in Autonomous Robots* [book]	https://www.taylorfrancis.com/books/9781420085952
2	Arkin, Ronald	2008	**“Governing lethal behavior: embedding ethics i n a hybrid deliberative/reactive robot architecture”**	https://dl.acm.org/citation.cfm?id=1349839
3	Goodall, Noah J.	2014	“Ethical Decision Making during Automated Vehicle Crashes”	https://journals.sagepub.com/doi/abs/10.3141/2424-07

4	Nomura, Tatsuya; Suzuki, Tomohiro; Kanda, Takayuki; Han,Jeonghye; Shin, Namin; Burke, Jennifer; Kato, Kensuke	2008	**“What people assume about humanoid and animal-type robots: cross-cultural analysis between Japan, Korea and the United States.”**	https://www.worldscientific.com/doi/abs/10.1142/S0219843608001297
5	Sparrow, Robert	2007	**“Killer Robots”**	https://onlinelibrary.wiley.com/doi/full/10.1111/j.1468-5930.2007.00346.x
6	Sullins, John P.	2010	**“RoboWarfare: can robots be more ethical than humans on the battlefield?**	https://link.springer.com/article/10.1007/s10676-010-9241-7
7	Lin, Patrick; Beke, George; Abney, Keith	2009	**“Robots in War – Issues of risk and Ethics”**	https://apps.dtic.mil/dtic/tr/fulltext/u2/a541977.pdf
8	Sparrow, Robert	2009	“**Predators or Plowshares”**	https://ieeexplore.ieee.org/abstract/document/4799404
9	Lee, Hee Rin; Sabanović, Selma	2014	**“Culturally variable preferences for robot design and use in South Korea,**	https://dl.acm.org/citation.cfm?id=2559676

			Turkey, and the United States”	
10	Enemark, Christian	2013	*Armed Drones and the Ethics of War* [book]	https://www.taylorfrancis.com/books/9781136261213
11	Culver, Kathleen Bartzen	2014	**“From Battlefield to Newsroom: Ethical Implications of Drone Technology in Journalism”**	https://www.tandfonline.com/doi/abs/10.1080/08900523.2013.829679
12	Singer, Peter W.	2011	**“Military Robots and Ethics - A World of Killer Apps“**	https://www.nature.com/articles/477399a
13	Jin, Linda X.; Ibrahim, Andrew M.; Newman, Naeem A.; Makarov, Danil V.; Pronovost , Peter J.; Makary, Martin A.	2011	**”Robotic Surgery Claims on United States Hospital Websites”**	https://onlinelibrary.wiley.com/doi/full/10.1111/j.1945-1474.2011.00148.x
14	Guetlein, Michael A.	2005	**“Lethal Autonomous Weapons -- Ethical and Doctrinal Implications”**	https://apps.dtic.mil/docs/citations/ADA464896

15	Parks, Jennifer A	2010	**“Lifting the Burden of Women's Care Work: Should Robots Replace the ‘Human Touch’?”**	https://onlinelibrary.wiley.com/doi/full/10.1111/j.1527-2001.2009.01086.x
16	Weber, Jutta	2019	**“Robotic Warfare, Human Rights & the Rhetorics of Ethical Machines”**	https://www.researchgate.net/publication/265010385_Robotic_Warfare_Human_Rights_the_Rhetorics_of_Ethical_Machines
17	Roff, Heather	2013	“Killing In War”- chapter of Routledge Handbook of Ethics and War: Just War Theory in the 21st Century	https://books.google.com/books?hl=en&lr=&id=xlda4rfRk1QC&oi=fnd&pg=PA352&dq=robots+ethics+United+States&ots=fFd9_Pqb6K&sig=BYfaHprbfj2RjIK5v_and6a-Kvw#v=onepage&q=robots%20ethics%20United%20States&f=false
18	Wallach, Wendell; Allen, Colin	2012	“Framing robot arms control”	https://link.springer.com/article/10.1007/s10676-012-9303-0
19	Kaminski, Margot E.	2015	**“Robots in the Home: What Will We Have Agreed To”**	https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2592500
20	Voelker, Rebecca	2005	**“Rehabilitation medicine welcomes a robotic revolution”**	https://jamanetwork.com/journals/jama/fullarticle/201514
21	Johnson, Deborah G.;	2014	”Responsibility Practices in Robotic Warfare”	https://www.questia.com/read/1G1-368957588/responsibility-practices-in-robotic-warfare

	Noorman, Merel E			
22	Sauer, F.	2016	“Stopping Killer Robots: Why Now Is the Time to Ban Autonomous Weapons Systems” **	https://www.armscontrol.org/print/7713
23	McDaneil, EA	2008	“Robot Wars: Legal and Ethical Dilemmas of Using Unmanned Robotics Systems in 21st Century Warfare and Beyond”	https://apps.dtic.mil/dtic/tr/fulltext/u2/a502401.pdf
24	Alston, P.	2012	“Lethal robotic technologies: the implications for human rights and international humanitarian law”	http://www5.austlii.edu.au/au/journals/JlLawInfoSci/2012/3.html
25	Clark, Peter A.; Capuzzi, Kevin; Harrison, Joseph	2010	“Telemedicine: Medical, legal and ethical perspectives”	https://www.medscimonit.com/download/index/idArt/881286
26	Geraci, R	2006	**”Spiritual robots: Religion and our scientific view of the natural world”**	https://www.tandfonline.com/doi/abs/10.1080/14746700600952993

27	Borenstein, Jason	2008	**“The Ethics of Autonomous Military Robots”**	https://www.degruyter.com/downloadpdf/j/selt.2008.2.1/selt.2008.2.1.1036/selt.2008.2.1.1036.pdf

TABLE 3.1 – Most relevant academic articles (basic information)

Most relevant academic articles on the ethics of AI and robotics in United States of America – Basic information				
Articles focusing mostly on artificial intelligence				
Nr.	**Author(s)**	**Year**	**Type of article**	**Title, abstract and URL**
1	Russell, Stuart; Hauert,Sabine; Altman, Russ; Veloso, Manuela	2015	Editorial /commentary	"Ethics of artificial intelligence" This article is a relatively recent commentary in Nature, the collected thoughts of four different esperts in the field, each sharing " their concerns and solutions for reducing societal risks from intelligent machines." https://www.nature.com/polopoly_fs/1.17611!/menu/main/topColumns/topLeftColumn/pdf/521415a.pdf?origin=ppub
2	Wong, Tien Yin; Bressler, Neil M.	2016	Commentary on presentation of original data	"Artificial Intelligence With Deep Learning Technology Looks Into Diabetic Retinopathy Screening" A discussion of a new deep learning technology for diabetic retinopathy screening. The authors discuss four main points, the latter two of which have to do with the ethics, explainability, and acceptance issues for the new technology. https://jamanetwork.com/journals/jama/article-abstract/2588762
3	Cath, Corinne; Wachter, Sandra; Mittelstadt; Brent; Taddeo; Mariarosaria;	2018	Commentary, policy	"Artificial Intelligence and the 'Good Society': the US, EU, and UK approach" "In October 2016, the White House, the European Parliament, and the UK House of Commons each issued a report outlining their visions on how to prepare society for the widespread use of artificial intelligence (AI). In this article, we provide a comparative assessment of these three reports in order to facilitate the design of policies favourable to the development of a 'good AI society'. To do so, we examine how each report addresses the following three topics: (a) the development

	Floridi, Luciano			of a ‘good AI society’; (b) the role and responsibility of the government, the private sector, and the research community (including academia) in pursuing such a development; and (c) where the recommendations to support such a development may be in need of improvement. Our analysis concludes that the reports address adequately various ethical, social, and economic topics, but come short of providing an overarching political vision and long-term strategy for the development of a ‘good AI society’. In order to contribute to fill this gap, in the conclusion we suggest a two-pronged approach.” https://link.springer.com/article/10.1007/s11948-017-9901-7
4	Ezrachi, Ariel; Stucke, Maurice E.	2017	Commentary, policy	”Artificial Intelligence & Collusion: When Computers Inhibit Competition” ” Sophisticated computers are central to the competitiveness of present and future markets. With the accelerating development of AI, they are set to change the competitive landscape and the nature of competitive restraints. As pricing mechanisms shift to computer pricing algorithms, so too will the types of collusion. We are shifting from the world where executives expressly collude in smoke-filled hotel rooms to a world where pricing algorithms continually monitor and adjust to each other's prices and market data. Our paper addresses these developments and considers the application of competition law to an advanced "computerised trade environment.” ”After discussing the way in which computerised technology is changing the competitive landscape, we explore four scenarios where AI can foster anticompetitive collusion and the legal and ethical challenges each scenario raises.” https://heinonline.org/HOL/Page?handle=hein.journals/unilllr2017&id=1816&collection=journals&index=
5	Whitman, Michael E.; Townsend,	1999	Presenting original	”Cross-national Differences in Computer-use Ethics: A Nine-country study”

	Anthony M.; Hendrickson, Anthony R.		qualitative data,	”This study examines computer-use ethics among nine countries (Singapore, Hong Kong, United States, Great Britain, Australia, Sweden, Wales, and the Netherlands). Based on Paradice [1990], an instrument was developed containing three scales focusing on ethical attitudes toward software license infringement, use of virus programs, and misuse of corporate computing resources. Analysis indicates that there are significant differences in ethical values among nationalities for each of these scales.” https://link.springer.com/content/pdf/10.1057%2Fpalgrave.jibs.8490833.pdf
6	Calo, Ryan	2017	Commentary, policy	”Artificial Intelligence Policy: A Primer and a Roadmap” ”The Essay is designed to help policymakers, investors, scholars, and students understand the contemporary policy environment around artificial intelligence and the key challenges it presents. These include: • justice and equity; • use of force; • safety and certification; • privacy and power; and • taxation and displacement of labor. In addition to these topics, the Essay will touch briefly on a selection of broader systemic questions: • institutional configuration and expertise; • investment and procurement; • removing hurdles to accountability; and • correcting flawed mental models of AI.” https://heinonline.org/HOL/LandingPage?handle=hein.journals/davlr51&div=18&id=&page=
7	Banavar, Guruduth	2016	Commentary, policy	”Learning to trust artificial intelligence systems” Accountability, compliance and ethics in the age of smart machines”

				” But trust will also require a system of best practices that can help guide the safe and ethical management of AI systems including alignment with social norms and values; algorithmic responsibility; compliance with existing legislation and policy; assurance of the integrity of the data, algorithms and systems; and protection of privacy and personal information. We consider this paper to be part of the global conversation on the need for safe, ethical and socially beneficial management of AI systems.” https://www.alain-bensoussan.com/wp-content/uploads/2017/06/34348524.pdf
Articles focusing mostly on robotics				
Nr.	**Author(s)**	**Year**	**Type of article**	**Title, abstract and URL**
1	Arkin, Ronald	2008	Commentary, policy	**” Governing lethal behavior: embedding ethics in a hybrid deliberative/reactive robot architecture”** ” This paper provides the motivation and philosophy underlying the design of an ethical control and reasoning system potentially suitable for constraining lethal actions in an autonomous robotic system, so that its behavior will fall within the bounds prescribed by the Laws of War and Rules of Engagement. This research, funded by the U.S. Army Research Office, is intended to ensure that robots do not behave illegally or unethically in the battlefield. Reasons are provided for the necessity of developing such a system at this time, as well as arguments for and against its creation.” https://dl.acm.org/citation.cfm?id=1349839
2	Nomura, Tatsuya; Suzuki, Tomohiro;	2008	presenting original qualitative data	”What People Assume About Humanoid and Animal-Type Robots: Cross-Cultural Analysis between Japan, Korea and the United States”

	Kanda, Takayuki; Han,Jeonghye; Shin, Namin; Burke, Jennifer; Kato, Kensuke			” To broadly explore the rationale behind more socially acceptable robot design and to investigate the psychological aspects of social acceptance of robotics, a cross-cultural research instrument, the Robot Assumptions Questionnaire (RAQ) was administered to the university students in Japan, Korea, and the United States, focusing on five factors relating to humanoid and animal-type robots: relative autonomy, social relationship with humans, emotional aspects, roles assumed, and images held. As a result, it was found that (1) Students in Japan, Korea, and the United States tend to assume that humanoid robots perform concrete tasks in society, and that animal-type robots play a pet- or toy-like role; (2) Japanese students tend to more strongly assume that humanoid robots have somewhat human characteristics and that their roles are related to social activities including communication, than do the Korean and the US students; (3) Korean students tend to have more negative attitudes toward the social influences of robots, in particular, humanoid robots, than do the Japanese students, while more strongly assuming that robots’ roles are related to medical fields than do the Japanese students, and (4) Students in the USA tend to have both more positive and more negative images of robots than do Japanese students, while more weakly assuming robots as blasphemous of nature than do Japanese and Korean students. In addition, the paper discusses some engineering implications of these research results.” https://www.worldscientific.com/doi/abs/10.1142/S0219843608001297
3	Sparrow, Robert	2007	Commentary, policy	”Killer Robots” ”This paper considers the ethics of the decision to send artificially intelligent robots into war, by asking who we should hold responsible when an autonomous weapon system is involved in an atrocity of the sort that would normally be described as a war crime. A number of possible loci of responsibility for robot war crimes are canvassed: the persons who designed or programmed the system, the commanding officer who ordered its use, the machine itself. I argue that in fact none of these are ultimately satisfactory. Yet it is a necessary condition for fighting a just war, under the principle of jus in bellum, that someone can be justly held responsible for deaths that occur in the course of the war. As this condition cannot be met in relation to deaths caused by an autonomous weapon system it would therefore be unethical to deploy such systems in warfare.” https://onlinelibrary.wiley.com/doi/full/10.1111/j.1468-5930.2007.00346.x

4	Lee, Hee Rin; Sabanović, Selma	2014	Presenting original qualitative data; policy	”Culturally variable preferences for robot design and use in South Korea, Turkey, and the United States” ”Based on the results of an online survey conducted with participants in South Korea (N=73), Turkey (N=46), and the United States (N=99), we show that people’s perceptions and preferences regarding acceptable designs and uses for robots are culturally variable on a number of dimensions, including general attitudes towards robots, preferences for robot form, interactivity, intelligence, and sociality. We also explore correlations between these design and use characteristics and factors cited as having an effect on user perceptions and acceptance of robots, such as religious beliefs and media exposure. Our research suggests that culturally variable attitudes and preferences toward robots are not simply reducible to these factors, rather they relate to more specific social dynamics and norms. In conclusion, we discuss potential design and research implications of culturally variable and universally accepted user preferences regarding robots.” https://dl.acm.org/citation.cfm?id=2559676
5	Culver, Kathleen Bartzen	2014	Commentary, policy	”From Battlefield to Newsroom: Ethical Implications of Drone Technology in Journalism” ”Unmanned Aerial Vehicles (UAVs), commonly known as “drones,” are a military technology now being developed for civilian and commercial use in the United States. With the federal government moving to develop rules for these uses in U.S. airspace by 2015, technologists, researchers, and news organizations are considering application of drone technology for reporting and data gathering. UAVs offer an inexpensive way to put cameras and sensors in the air to capture images and data but also pose serious concerns about safety, privacy, conflict of interest, perspective, and credibility.

				This research examines the early ethical considerations among drone journalism developers and digital information activists. It places those considerations against the backdrop of utilitarian ethical theory applied to journalism to suggest additional layers of reasoning that must be applied to drones in reporting. Finally, it suggests articulation of ethical guidelines and transparency with the public as means to address inevitable adverse effects of use of this technology." https://www.tandfonline.com/doi/abs/10.1080/08900523.2013.829679
6	Parks, Jennifer A	2010	Commentary, policy	"Lifting the Burden of Women's Care Work: Should Robots Replace the "Human Touch"?" "This paper treats the political and ethical issues associated with the new caretaking technologies. Given the number of feminists who have raised serious concerns about the future of care work in the United States, and who have been critical of the degree to which society ''free rides'' on women's caretaking labor, I consider whether technology may provide a solution to this problem. Certainly, if we can create machines and robots to take on particular tasks, we may lighten the care burden that women currently face, much of which is heavy and repetitious, and which results in injury and care ''burnout'' for many female caretakers. Yet, in some contexts, I argue that hightech robotic care may undermine social relationships, cutting individuals off from the possibility of social connectedness with others." https://onlinelibrary.wiley.com/doi/full/10.1111/j.1527-2001.2009.01086.x
7	Webber, Jutta	2019	Commentary, analysis, policy	"Robotic Warfare, Human Rights & the Rhetorics of Ethical Machines" "Killing with robots is no more a future scenario but became a reality in the first decade of the 21st century. The U.S. and Israel forces are using uninhabited combat aerial vehicles (UCAVs) in their so-called wars on terror, especially for targeted killing missions in Iraq, Pakistan, Afghanistan as well as in Lebanon and the Palestinian occupied territories (for example in Israel's recent war on Gaza). In the last years, the number of UCAV air attacks is rising significantly as well as the number of killed civilians. Nevertheless, the automation of

				warfare is envisioned by the US government and military for 2032 at the latest and military robots are increasingly used in civilian contexts. In the face of these developments, discussions on robotic warfare as well as security technology from a science and technology studies and technoethical perspective are highly needed. Important questions are how robotic warfare and security applications may find their way into society on a broad scale and whether this might lead to a new global arms race, violation of the international law of warfare, an increasing endangerment of civilians transporting racist and sexist implications,and the blurring of boundaries between military, police and civil society." To appear in: *Rafael Capurro / Michael Nagenborg / Giugelmo Tamburinni (eds.): Ethics and Robotics. Deutscher Akademieverlag (in preparation)*
8	Kaminski, Margot E.	2015	Commentary, policy (legal)	"Robots in the Home: What Will We Have Agreed To?" "This essay addresses robots in the home, and what they reveal about U.S. privacy law. Household robots might not themselves destroy U.S. privacy law, but they will reveal its inconsistencies, and may show where it is most likely to fracture" https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2592500
9	Geraci, R	2006	Commentary, policy	"Spiritual robots: Religion and our scientific view of the natural world" "Religion plays a powerful role in the formation of scientific theories. By comparing the goals and practice of robotics and artificial intelligence in the US and Japan, differences between the two countries can be traced to their religious environments. Christian expectations of cosmic purpose and hope for salvation in purified, unearthly bodies leads to US researchers' preference for artificial intelligence over humanoid robots, a desire to see cosmic meaning in the development of that intelligence, and salvation of human minds in virtual, non-biological bodies. In Japan, robots, which have been the subjects of ritual consecrations and religious transcendence, participate in a fundamental sanctity of the natural world. A positive outlook on being human promotes a preference for humanoid robots and a future in which robots serve human beings, who do not forsake their bodies for virtual lives. Divergent scientific strategies cannot be separated from the religious worlds of their practitioners."

				https://www.tandfonline.com/doi/abs/10.1080/14746700600952993

TABLE 3.2 – Most relevant academic articles (ethical information part 1)

Most relevant academic articles on the ethics of AI and robotics in United States of America– Ethical information (part 1)					
Articles focusing mostly on artificial intelligence					
Nr.	**Author(s)**	**AI and/or robotics**	**Products, systems and/or processes discussed**	**Application areas discussed**	**Ethical concepts, issues and values discussed & their timeline(s)**
1	**Russell, Stuart; Hauert,Sabine; Altman, Russ; Veloso, Manuela**	AI and Robotics	lethal autonomous weapons systems (LAWS); policy and communications processes and strategies; assistive robots; medical analysis	Military; medical/healthcare; human/robot interactions	Current and near future issues – an immediate to 5-10 year timeline; human rights; explainability
2	**Wong, Tien Yin; Bressler,** Neil M.	AI	Deep learning techniques for medical screening	Healthcare, diabetic screening	The explainability of the algorithms used; the accuracy of the technique across diverse populations; ethics of implementation; general acceptance of AI-based medicine
3	**Cath, Corinne; Wachter, Sandra; Mittelstadt; Brent; Taddeo; Mariarosaria; Floridi, Luciano**	AI	AI broadly; R&D; governmental policy; diversity; (self-) regulation	”(a) the development of a ‘good AI society’; (b) the role and responsibility of the government, the private sector, and the research community (including academia), in pursuing such a development; and	Public-private partnerships; AI for development; ethics broadly; transparency; economic impacts

				(c) whether the recommendations to support such a development may be in need of improvement.”	
4	Ezrachi, Ariel; Stucke, Maurice E.	AI	AI-based trade; deep learning; collusive pricing;	Competition and anti-trust law; financial markets; trade; computerized trading; AI-induced anticompetitive collusion and its legal and ethical challenges”; the relationship between humans and computers, and the possibility of creating ethical, law-abiding machines.	Anti-trust; consumer confidence; consumer harm; liability; transparency and explainability; regulation On an almost immediate timeline.
5	Whitman, Michael E.; Townsend, Anthony M.; Hendrickson, Anthony R.	Proto-AI	Ethical codes of computer use	Computer ethics; codes of conduct	Ethical codes; cross-cultural use patterns; of historical interest;
6	Calo, Ryan	AI	AI policy generally; decision making;	Criminal justice; privacy; safety; big data; labor; governmental regulation	justice and equity; use of force; safety and certification; privacy and power; taxation and displacement of labor.

7	Banavar, Guduruth	AI	AI ethics and governance from a corporate perspective	Trust, transparency, explainability, bias and accountability; embedded values	Augmented intelligence; ethical codes and governance generally.
Articles focusing mostly on robotics					
Nr.	**Author(s)**	**AI and/or robotics**	**Products, systems and/or processes discussed**	**Application areas discussed**	**Ethical concepts, issues and values discussed & their timeline(s)**
1	Arkin, Ronald	Robotics	Ethical control systems for autonomous weapons (drones)	Human-Robot interaction, Robot ethics, battlefield robots; unmanned systems, autonomous robots.	”artificial conscience”; laws of war; rules of engagement; robot/human conparative ethical superiority (context-dependent)
2	Nomura, Tatsuya; Suzuki, Tomohiro; Kanda, Takayuki; Han,Jeonghye; Shin, Namin; Burke, Jennifer; Kato, Kensuke	Robotics	Cultural assumptions about humanoid and animal robots	Household robots, robots in general society; specialized robots, including industrial and recreational; medicine	Acceptance, autonomy, utility, social integration
3	Sparrow, Robert	Robotics; AI	Autonomous weapons systems; artifically intelligent robots in war	Military robots and AI; autonomous weapons; drones (UAV, UCAV)	Ethics of war, ethics of autonomous weapons; liability; morality of robots
4	Lee, Hee Rin; Sabanović, Selma	Robotics	Robots in general – spectrum of contexts and uses	Robots throughout human culture: home, factory, military, medicine, etc.; preferred robot design & form factors; social role(s)	Cultural acceptance of and attitudes towards robots in society; influence of religion and media exposure on attitudes

5	Culver, Kathleen Bartzen	Robotics	Drones, esp. UAVs with cameras and other sensors	journalism	Ethics of drone journalism vis-a-vis safety, privacy, conflict of interest, perspective, and credibility; utilitarian ethical theory applied to journalism; articulation of ethical guidelines and transparency with the public to address adverse effects
6	Parks, Jennifer A	Robotics	Caretaker robots: Home-care; medical assistance, ”companions”	Medicine, elder-care, assisted living	Human rights aspects of robotic assited care and living; labor implications,
7	Webber, Jutta	Robotics	Military robots, AWS, drones	Military and combat applications	Ethics of autonomous weapons, law of war; humans in/out of decision loops
8	Kaminski, Margot E.	Robotics, big data	Household robots and AI assistants	Living at home; privacy; social norms	Privacy, social norms, US law and social norms interfacing with and being altered by new technologies
9	Geraci, R	Robotics & AI	Robots generally, especially robotic consciousness; industrial, household and humanoid robots	Robots (and AI) and their role and integration within society.	Norms of cultural acceptance; robotic/AI personhood; human rights and human/robot interaction

TABLE 3.3 – Most relevant academic articles (ethical information part 2)

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Most relevant academic articles on the ethics of AI and robotics in United States of America – Ethical information (part 2)

Articles focusing mostly on artificial intelligence (AI)				
Nr.	**Author(s)**	**Research question**	**Main findings**	**Additional comments**
1	**Russell, Stuart; Hauert,Sabine; Altman, Russ; Veloso, Manuela**	N/A; topics of discussion are AI weapons; shaping policy conversations through deliberate outreach; fairly distributing medical benefits of AI & R; and moving toward a cooperative ”robot-human world”	AI weapons are a primary ethical concern in the near future, the research community must take a stand; better mindful outreach from the scientifc and research community is needed to successfully shape the policy debate; If the benefits of new AI & R medical breakthroughs are not carefully allocated, current inequities could be reinforced;Goal should be to move toward deliberate complmentarity	I chose this article because of the prominence of its publication and because it presented a range of views from authors in several different fields, commenting on what they saw as immediate and near-future areas of critical interest for research, ethics, policy discussions and general acceptance of new technologies.
2	**Wong, Tien Yin; Bressler,** Neil M.	Effectivenss of deep learning-based screening for diabetic retinopathy	Commentary identifies four key issues related to promising new techniques: - The limitations of the current study, in terms of rating outcomes - The accuracy and applicability of the new tech across more diverse populations - The practical implications of deploying the new tech, especially with respect to global health and public resources. - Explainability and its link to general acceptance, adoption and use	Although this was a relatively short piece, and in fact a commentary on a longer original paper, I chose it because it is a recent example of professionals within a specific field affected by AI grappling with the immediate practical and ethical implications to their profession and community of a real, not hypothetical, AI-based technology
3	**Cath, Corinne; Wachter, Sandra; Mittelstadt;**	Cross-jurisdictional policy analysis	Analysis and criticism addresses the three countries’ reports and whether/how well they address: ”(a) the development of a ‘good AI society’;	I chose this article because it quite explcitlyand in some details compares, analyzes and criticizes high-level governmental reports from the US, UK,

	Brent; Taddeo; Mariarosaria; Floridi, Luciano		(b) the role and responsibility of the government, the private sector, and the research community (including academia), in pursuing such a development; and (c) whether the recommendations to support such a development may be in need of improvement."	and EU, providing an informed and valuable perspective.
4	Ezrachi, Ariel; Stucke, Maurice E.	The application of competition law to an advanced "computerised trade environment.**"** How computerised technology is changing the competitive landscape & four scenarios where AI can foster anticompetitive collusion and the legal and ethical challenges each scenario raises.	The article examines and discusses four main types of algorithmic processes that might influence trade and markets for good or ill; and possible avenues for regulation or minimizing consume rharm	Chosen because it is one of the few results from the searches discussing financial markets and effect on consumers. The piece, although having a legal focus, directly addresses possible regulatory interventions.
5	Whitman, Michael E.; Townsend, Anthony M.; Hendrickson, Anthony R.	To determine if attitudinal differences in computer-use ethics exist between countries	"Overall, the study found that there is a general agreement among persons of different nationalities as to what is acceptable or unacceptable computer use; what does differ significantly is the degree of expressed intolerance toward specific kinds of actions."	The article is a relatively early (to the global internet) cross-cultural study on computer use ethics. Although from 1999, as an empirical study comparing ethical attitudes across nine countries, it seemed useful in terms of developing more universal ELSI guidelines.

			”In Table 5, for example, the U.S. (Set A) differs significantly from the countries in Sets B and C. Countries within Set B do not differ significantly from each other, and are all significantly different from Set C (the Netherlands);	
6	Calo, Ryan	To provide a ”road map” to the various challenges that AI poses for policymakers; offering discrete challenges, in specific domains and cross-domain general questions	-”Not a conclusory piece, more of a provocation.” -brief primer on artificial intelligence, defining AI in relation to previous and constituent technologies and by noting the ways the contemporary conversation around AI may be unique. - obvious break with the past is the extent and sophistication of the policy response to AI in the United States and around the world. -seeks to provide an inventory or roadmap of the serious policy questions that have arisen to date. - to inform AI policymaking, broadly understood, by identifying the issues and developing the questions to the point that readers can initiate their own investigation. -The roadmap is idiosyncratic to the author but informed by longstanding participation in AI policy.	Calo is considered one of the top two or three thinkers on AI in the United States, if not more broadly. His work thoroughly grounded in US legal theory,ethics and policy. As one of his most recent pieces, this overview is essential to gaining an understanding of where current US thinking is likely to go. See also his more legally oriented piece Ryan Calo, *Robotics and the Lessons of Cyberlaw,* 103 Calif. L. Rev. 513-63 (2015), *available at* http://papers.ssm.com/so13/papers.cfrn?abstract-id=2402972.

7	Banavar, Guduruth	To discuss and try to understand better the necessary coporate responsibilities in developing and deploying safe and ethical AI systems,conceived broadly.	-Ethical guidelines and compliance mechanisms are essential; as is a dedicated ethical advisor and extensive testing - All AI systems should include explanation-based collateral systems -Bias must be acknowledged and explicitly managed -The ethical norms of existing industries like healthcare and finance are a viable model -every AI system will need to have its own interactive and adaptive ethics module	This piece written by IBM's Chief Science Officer, deals explicitly, albeit at a high level,with coporate plans to move forward on ethics and governance of AI. It makes specific recommendations about how and in what way to create and maintain ethical governance systems

Articles focusing mostly on robotics

Nr.	Author(s)	Research question	Main findings	Additional comments
1	Arkin, Ronald	"To yield ethical performance by autonomous systems that eventually exceed that of human soldiers.	This paper presents the background, motivation and philosophy for the design of an ethical autonomous robotic system capable of using lethal force. - "by making the assignment of responsibility transparent and explicit, through the use of an architectural component serving as a responsibility advisor at all steps in the deployment of these systems", the responsibility problem for autonomous sytems is indeed solvable.	Arkin is one of the most often cited figures regarding ethics of autonomous force. Although it is a fairly specific topic area, the depth of thought that has been invested is undoubtedly more broadly applicable, at least as a template for investigation. [See also his much earlier work *Governing Lethal Behavior in Autonomous Robots* (1970)]

2	Nomura, Tatsuya; Suzuki, Tomohiro; Kanda, Takayuki; Han,Jeonghye; Shin, Namin; Burke, Jennifer; Kato, Kensuke	”To broadly explore the rationale behind more socially acceptable robot design and to investigate the psychological aspects of social acceptance of robotics,”	(1) Students in Japan, Korea, and the United States tend to assume that humanoid robots perform concrete tasks in society, and that animal-type robots play a pet- or toy-like role; (2) Japanese students tend to more strongly assume that humanoid robots have somewhat human characteristics and that their roles are related to social activities including communication, than do the Korean and the US students; (3) Korean students tend to have more negative attitudes toward the social influences of robots, in particular, humanoid robots, than do the Japanese students, while more strongly assuming that robots' roles are related to medical fields than do the Japanese students, and (4) Students in the USA tend to have both more positive and more negative images of robots than do Japanese students, while more weakly assuming robots as blasphemous of nature than do Japanese and Korean students. -In addition, the paper discusses some engineering implications of these research results.	This paper was an empirical (questionnaire-based) cross-cultural study of attitudes towards robots and their role in society. Especially since it involved a country not part of the SIENNA consortium, it seemed worthwhile to include as a window into designing ethical practices that might be readily accepted internationally, as well as offering insight into social issues. [See also the work of Dr. Kate Darling, which did not appear using the designated search methods - http://www.katedarling.org/publications]
3	Sparrow, Robert	”Who we should hold responsible when an autonomous weapon system is involved in an atrocity of the sort that would normally be	[since] ”this condition [responsibility] cannot be met in relation to deaths caused by an autonomous weapon system it would therefore be unethical to deploy such systems in warfare.”	Together with Ronald Arkin, Sparrow is one of the authors most prominent in the results of the searches performed, and in fact the two of them and their work are often in dialog. This piece seemed a good choice to include since it engages in an explicitly technical philosophical

		described as a war crime?" . .		inquiry, the methodology of which might well serve as a template for other robotic or AI use cases.
4	Lee, Hee Rin; Sabanović, Selma	"We present the results of a survey performed in the US, S. Korea, and Turkey exploring the incidence and correlations of factors previously identified as relevant to robot design and use, including religious beliefs, popular media portrayals of robots, and preferences for robot appearance and use."	"Our results show culturally variable perceptions regarding robots design and use, and suggest that culturally variable preferences are not directly explained by previously emphasized factors, such as religious affiliation and media exposure." "We identified culturally variable design characteristics and salient cultural factors that affect user conceptions and evaluations of robots. Our exploratory study emphasizes the importance of performing cross-cultural studies of robots that go beyond general characteristics and delve into more contextually and socially situated dynamics of sense making and interaction to develop technologies for global markets. We particularly suggest focusing not only on cultural difference but also on similarity, and doing situated studies of robot use contexts to clearly identify how culturally variable factors might be incorporated into designing future robots.	Like the Nomura piece, this paper was one of a smaller group within the results that dealt directly with how people "feel" about robots generally. In addition to being another usefullycross-cultural study, this paper makes sugegstions about targeted design choices that might lead to greater social acceptance.
5	Culver, Kathleen Bartzen	[To] examine[] the early ethical	[The difficult challenge of discerning ethical drone use in journalism is not a	This article seemed worthy of inclusion for several reasons. First, it explicitly seeks to

		considerations regarding drone journalism, place those considerations against the backdrop of utilitarian ethical theory applied to journalism to suggest additional layers of reasoning that must be applied to drones in reporting, and finally to articulate ethical guidelines and transparency with the public as means to address inevitable adverse effects of use of this technology.	reson to categorically ban use] ”Instead, it should be seen as an urgent reason to engage in broad discussions of ethics and education of the public. News organizations’ adoption of drone technologies must be paired with clear articulations of their ethical use and full transparency with the public.”	develop a domain-specific ethics for robotic technologies, grounded in philosophy. Second it bridges a gap between military and civilian uses of robotic tech, with corresponding ethical implication, and as such was one of the low number of works from the search that dealt with drones but not military ethics.see also discussion of ”co-shaping”; and generally developing ethical guidelines for repurposed tools and technology
6	Parks, Jennifer A	”whether technology may provide an answer to the (feminist) concerns of caretaking in the United States, and the degree to which society ‘‘free rides’’ on women’s caretaking labor. We must be respectful of and responsive to culturally produced identities that may be motivating the push for robotic care, and	If robotic care will present serious problems, other models for addressing the looming care crisis must be in place. The author advocates ”a more holistic, natural, and inclusive model of care” which deemphasises or eliminates robotic elements.	Chosen in art because it is an ethical analysis written from a feminist/critical theory viewpoint, (i.e., Habermasian sociology) something I did not often seen in the literature emerging from the search and therefore a valuable perspective. Also because of engaging with the human rights and well-being and effects-on-society aspect of ethical use of robotic technologies. Finally, this paper is almost overtly anti-robot and is valuable addition to the conversation for that reason re: ethical adoption.

		the degree to which they enhance or undermine human capabilities, and social connectedness”		
7	Weber, Jutta	” Problems of future war scenarios are outlined with regard to human rights and international law issues. Technophilic imaginaries linked to the ‘Robowar Dreams’ (Graham 2007), ‘humane’ warfare as well as rhetorics of a possible ethics of future autonomous robotic systems are discussed and recommendations are given.”	” Given the massive ethical and socio-political problems that come with robot weapons . . . we need a broad international and public debate on robotic warfare technologies.” “Further critique of robotic warfare does not only need to focus on the contradictions to the law of warfare . . . but also on the pervasion of civil society with robot applications.” “[The] limitations of AI resp. robot weapon systems must be repeatedly called into memory to counteract the common glorification of the capabilities of future . . . systems.”	7
8	Kaminski, Margot E.	”The legally salient aspects of home robots may drive a collision between the doctrinal understanding of privacy in real physical space, and privacy in the digital realm” revealing ”inconsistent understandings of	” Considering household robots reveals two interesting substantive splits between the Fourth Amendment approach to privacy, and the approach we use to address private actors. ” ”what household robots most reveal is the continued need in the United	8

		permission and consent in context, across privacy law."	States for a holistic approach to big data."	
9	Geraci, R	When scientists lack a common religious background, their approaches—even within the same field—will differ. A cross-cultural examination of robotics and artificial intelligence (AI)2 in the United States and Japan shows how research paradigms rely on their religious environments.	" Religious environments affect our view of the natural world and thereby direct scientific practice; when we see the world differently, we practice science differently. Disparate approaches to robotics and AI in the US and Japan demonstrate how a scientific field can diverge based upon the religious worlds of its practitioners."	Useful because of discussions of how cultural assumptions and norms can be path-dependent for research into AI&R; will also be of use regarding creating ethical guidelines that will be more easily accepted and understood cross-culturally; medium-term past

Summary Report on academic literature review

The most intriguing, salient, and somewhat surprising result from the searches I performed of the academic literature was the preponderance of texts within the results, whether satisfying all of the SIENNA inclusion criteria or not, having to do with drones and autonomous robots especially drone warfare, or autonomous weapons, and the ethics of their use and design. This over-representation was true irrespective of date, and there was no trend away from or toward it based on a more granular subdivision of years. The second most common topic in results, though a distant second, were anything related to the medical industry, though mostly quite practical, and a third were studies of human acceptance of AI &R broadly, whether attitudes toward robots in the home or of AI in the doctor's office, as just a few examples.

The reasons for the strong focus on military drones and weapons, and drones in general within the literature is itself still an open question. It may be that the nature of R& D and academic funding and research in the United States has led to an overconcentration of resources in this area – the military has a lot of money, Silicon Valley is very interested in driverless cars, etc. - leading in turn to a corresponding overproduction in the academic literature.

Alternatively, the dearth of research may be a reflection of the recent change in prioritization re AI & R at the national level within the United States. While as of 2016, the Obama Administration has put into place a variety of AI&R (and related technology) boards and advisory councils, as well as national strategy documents, including re: ethics, as well as practical research the current Trump Administration has

invested little to no effort on these topics, and when it has done so, has tended to revert responsibility to the private sector, which has only in the last few years taken up ethics as a priority topic. Academic researchers may have "followed the money" and shelved plans to work on ethics in AI and Robotics except as they are able to find funding, cf. driverless cars, the military and "disrupting" the medical industry. The corporate U.S is only very recently paying attention to the broader or more theoretical ethics concerns of the technology that it is developing 9 or being forced to do so

One other surprising or at least unusual result was number of papers in the results from both the AI and the robotics searches having to do with nanotechnology. Since this was not even a tangentially related topic, it at least suggests that current paper authors may be somewhat over-inclusive, even to the point of wishful thinking, in their keywords or in the ambit of their analysis and conclusions, which may inform future searches.

Unsurprisingly, dates of AI-related publications trended quite recent, mostly within the last five years, with any texts prior to even 2010 being much more broadly theoretical in nature, or addressing general concepts. Robot-related publications spanned a larger range of years, going unsurprisingly much further back, but with no clear trends

The lack of any recent trend toward a broader or more inclusive array of topics or toward very recent publication may also be because this is "calm before the storm" as it were, and that a wide range of papers is about to be published. For example, in the U.S. and English-speaking media, not a day goes by without seeing announcements about another AI-related think-tank, academic center or other research initiative starting operations; and there is an almost overwhelming plethora of news and popular media stories. So it is at least possible that the U.S. academic establishment has simply not yet begun to publish regularly, with regard to the ethics of AI&R broadly, especially since most academic writing has a much slower pace to publication that popular media, but its productivity will soon catch up. Or it may mean that the pace of progress and thinking in the AI& R world is currently so rapid that even academics are publishing their thinking in less traditional but swifter-to-publication and therefor higher impact channels.

On a final note, with respect to the searches, especially re: media studies, not producing an expected number or density of results, or results that are representative of instincts as to the current state of the field, there are several possibilities to consider. First, of course, is that the results are in fact accurate, and there simply is not much scholarship as of yet in the AI ethics field broadly. Putting that hypothesis aside, there may be some mismatch between the search string(s) used, the way in which the Google Scholar algorithm functions, and the academic material that has been published. It may be worth considering whether a more comprehensive search or searches using different methods might produce different and more useful results

Methods

The materials contained within this report were researched and prepared following the instructions provided by SIENNA for tasks x.4, specifically 4.4, AI & Robotics, found in the document "FINAL INSTRUCTIONS country specific work X.4" and its later supplements.

For Section I- Academic Literature, when searching for AI results, the Google Scholar search string "artificial intelligence ethics United States," which produced 205,000 results. The first ten pages of results yielded an initial total of twenty-nine articles that appeared to meet the search criteria, from which were selected nineteen for inclusion in Table 3, and a further seven for inclusion in tables 3.x.

For the robotics topic, the Google Scholar search string “robots ethics United States” yielded 52,900 results. Of note is that many of the first page results were not United States specific. An initial total of thirty articles that appeared to meet the search criteria were extracted from first ten pages of results, of which twenty-seven were selected for inclusion in Table 2, and a subset of nine for inclusion in tables 3.x. For both AI & R, the chosen works are presented in the order in which they appeared in search results, not in chronological order of publication. Several results appeared in both the AI and the robotics searches, and when this occurred, they were only included in one of the sets of tables, whichever seemed more germane. For both AI & R tables 3.x, works were selected for inclusion in order to cover as wide range of topics as possible, while allowing Table 2 to demonstrate the preponderance of the drone and military topics.

TABLE 4 – All relevant media articles found during search

Items marked with a * were found through Google Scholar searches for media studies results. Items marked with a # were found searching the New York Times archive. All other articles were found through more expansive general media searches predicated on Google News Alerts.

List of media articles on the ethics of artificial intelligence and robotics in United States of America				
Articles focusing mostly on artificial intelligence				
Nr.	**Author(s)**	**Year**	**Title**	**URL**
1#	Bowles, Nellie; Gelles, David; & Metz, Cade	2019	“What Did We Learn at the New Work Summit?	https://www.nytimes.com/2019/03/03/business/new-work-summit-conversation-recap
2#	Various	2019	“Business Leaders Set the A.I. Agenda”	https://www.nytimes.com/2019/03/03/business/new-work-summit-questions.html?sea
3#	Metz, Cade	2018	“Seeking Ground Rules for A.I.”	https://www.nytimes.com/2019/03/01/business/ethical-ai-recommendations.html?sea
4#	Metz, Cade	2018	“Is Ethical A.I. Even Possible?”	https://www.nytimes.com/2019/03/01/business/ethics-artificial-intelligence.html?sear

5#	Singer, Natasha	2018	“Amazon Is Pushing Facial Technology That a Study Says Could Be Biased”	https://www.nytimes.com/2019/01/24/technology/amazon-facial-technology-study.htr
6#	Wakabayash, Daisuke	2018	“Firm Led by Google Veterans Uses A.I. to ‘Nudge’ Workers Toward Happiness”	https://www.nytimes.com/2018/12/31/technology/human-resources-artificial-intelliger
7#	Atherton, Kelsey D.	2018	“Are Killer Robots the Future of War? Parsing the Facts on Autonomous Weapons”	https://www.nytimes.com/2018/11/15/magazine/autonomous-robots-weapons.html?s
8#	Thompson, Clive	2018	“May A.I. Help You?”	https://www.nytimes.com/interactive/2018/11/14/magazine/tech-design-ai-chatbot.ht
9#	Tugend, Alina	2018	“The Commonality of A.I. and Diversity”	https://www.nytimes.com/2018/11/06/business/dealbook/the-commonality-of-ai-and-
10#	Tugend, Alina	2018	“Colleges Grapple with teaching the technology and ethics of AI”	https://www.nytimes.com/2018/11/02/education/learning/colleges-grapple-with-teach
11#	Metz, Cade	2018	“Artificial Intelligence Is Now a Pentagon Priority. Will Silicon Valley Help?”	https://www.nytimes.com/2018/08/26/technology/pentagon-artificial-intelligence.html

12#	Clark, Andy	2018	“We Are Merging With Robots. That’s a Good Thing.”	https://www.nytimes.com/2018/08/13/opinion/we-are-merging-with-robots-thats-a-go
13#	Turkle, Sherry	2018	“There Will Never Be an Age of Artificial Intimacy”	https://www.nytimes.com/2018/08/11/opinion/there-will-never-be-an-age-of-artificial-i
14#	Latiff, Robert H.	2018	“Rebooting the Ethical Soldier”	https://www.nytimes.com/2018/07/16/opinion/sunday/high-tech-warfare.html?searchI
15#	Roose, Kevin	2018	“Kevin’s Week in Tech: Are Google’s A.I.-Powered Phone Calls Cool, Creepy, or Both?”	https://www.nytimes.com/2018/05/11/technology/kevins-week-in-tech-are-googles-ai
16#	Various	2018	“How Artificial Intelligence Is Edging Its Way Into Our Lives”	https://www.nytimes.com/2018/02/12/technology/artificial-intelligence-new-work-sum
17	Saxena, Manoj	2019	“How To Prevent AI Ethics Councils From Failing”	https://www.forbes.com/sites/cognitiveworld/2019/04/30/how-to-prevent-ai-ethics-cou
18	Piernicky, Tom	2019	“AI, robots and the future of warfare: discussions among Mad Scientists”	https://www.armyrecognition.com/analysis_focus_army_defence_military_industry_a

19	Atherton, Kelsey D.	2019	“Can the Pentagon sell Silicon Valley on AI as ethical war?”	https://www.c4isrnet.com/unmanned/2019/04/26/can-the-pentagon-sell-silicon-valley
20	Vaggalis , Nikos	2019	“Ethics Guidelines For Trustworthy AI”	https://www.i-programmer.info/programming/artificial-intelligence/12702-ethics-guide
21	O’Brien, Matt; Lerman, Rachel	2019	“How Real Are 'Ethical Artificial Intelligence' Efforts by Tech Giants?”	https://www.insurancejournal.com/news/national/2019/04/11/523460.htm
22	Smith, Susan	2019	“Artificial Intelligence Presents ‘Black Swan’ Ethical Points”	http://normangazette.com/artificial-intelligence-presents-black-swan-ethical-points/68
23	Tahmincioglu, Eve	2019	“5 Core Principles of AI Ethics”	https://www.directorsandboards.com/articles/single5-core-principles-ai-ethics
24	Johnson, Bobbie and Lichfield, Gideon	2019	“Hey Google, sorry you lost your ethics council, so we made one for you”	https://www.technologyreview.com/s/613281/google-cancels-ateac-ai-ethics-council-
25	Castelvecchi , David	2019	“AI pioneer: ‘The dangers of abuse are very real’”	http://www.nature.com/articles/d41586-019-00505-2

26	Paulus, Michael		“The Possibilities of AI Ethics”	https://www.patheos.com/blogs/digitalwisdom/2019/04/the-possibilities-of-ai-ethics/
Articles focusing mostly on robotics				
Nr.	**Author(s)**	**Year**	**Title**	**URL**
1*	Carpenter, Charli	2016	”Rethinking the Political / -Science- / Fiction Nexus: Global Policy Making and the Campaign to Stop Killer Robots”	https://www.cambridge.org/core/journals/perspectives-on-politics/article/rethinking-th killer-robots/0D8C4B8B0D0965800B1133DD0BE5B99A [no access]
2*	Plotnick, Rachel	2012	”Predicting push-button warfare: US print media and conflict from a distance, 1945–2010”	https://journals.sagepub.com/doi/abs/10.1177/0163443712449495 [access]
3*	Nicholas R. Maradin	2013	“Militainment and mechatronics: *Occultatio* and the veil of science fiction cool in United States Air Force advertisements”	https://link.springer.com/content/pdf/10.1007%2Fs10676-013-9316-3.pdf [access]
4#	Atherton, Kelsey D.	2018	“Are Killer Robots the Future of War? Parsing the Facts on Autonomous Weapons”	https://www.nytimes.com/2018/11/15/magazine/autonomous-robots-weapons.html?s

5#	Clark, Andy	2018	“We Are Merging With Robots. That’s a Good Thing.”	https://www.nytimes.com/2018/08/13/opinion/we-are-merging-with-robots-thats-a-go
6#	Turkle, Sherry	2018	“There Will Never Be an Age of Artificial Intimacy”	https://www.nytimes.com/2018/08/11/opinion/there-will-never-be-an-age-of-artificial-i
7#	Robillard, Michael	2018	“The Killer Robots are Us”	https://www.nytimes.com/2018/01/29/opinion/killer-robots-weapons.html?searchRes
8#	Hardy, Quentin	2016	“Daily Report: How to Think About ‘Thinking’ Machines”	https://www.nytimes.com/2016/11/03/technology/daily-report-how-to-think-about-thin
9#	Various	2016	“What Ethics Should Guide the Use of Robots in Policing?”	https://www.nytimes.com/roomfordebate/2016/07/14/what-ethics-should-guide-the-u
10#	Markoff, John	2016	“Should Your Driverless Car Hit a Pedestrian to Save Your Life?”	https://www.nytimes.com/2016/06/24/technology/should-your-driverless-car-hit-a-pe
11#	Gelles, David	2016	“Investing With a Conscience, but Done by a Robot”	https://www.nytimes.com/2016/04/07/business/dealbook/investing-with-a-conscience
12#	Manly, Lorne	2016	“Eye in the Sky’ and ‘National Bird’ Train Sights on Warfare by Remote Control”	https://www.nytimes.com/2016/03/13/movies/helen-mirren-eye-in-the-sky-and-nation

13#	Vlahos, James	2015	“Barbie Wants to Get to Know Your Child”	https://www.nytimes.com/2015/09/20/magazine/barbie-wants-to-get-to-know-your-ch
14#	Kaplan, Jerry	2015	“Robot Weapons: What’s the Harm?”	https://www.nytimes.com/2015/08/17/opinion/robot-weapons-whats-the-harm.html?s
15#	Bilton, Nick	2015	“Ava of ‘Ex Machina’ Is Just Sci-Fi (for Now)”	https://www.nytimes.com/2015/05/21/style/ava-of-ex-machina-is-just-sci-fi-for-now.ht
16#	Marantz Henig, Robin	2015	“Death By Robot”	https://www.nytimes.com/2015/01/11/magazine/death-by-robot.html?searchResultPo
17#	Eisenberg, Anne	2014	“The Rolling Robot Will Connect You Now”	https://www.nytimes.com/2014/03/02/technology/the-rolling-robot-will-connect-you-n
18	McIntyre, Liam	2019	“Robotics needs ethical guidelines, speakers say at Vatican meeting”	https://www.catholicnews.com/services/englishnews/2019/robotics-needs-ethical-gui
19	Tonkens, Ryan	2019	“A Challenge for Machine Ethics”	https://link.springer.com/article/10.1007%2Fs11023-009-9159-1
20	Smith, Jamie	2018	“Practical ethics projects tackle robotics, autonomous vehicles, humanitarian disasters”	https://hub.jhu.edu/2018/11/13/berman-institute-practical-ethics/

21	Vander Ark, Tom	2018	“Curbing Killer Robots And Other Misuses Of AI”	https://www.forbes.com/sites/tomvanderark/2018/10/01/curbing-killer-robots-and-oth
22	Koetsier, John	2018	“92% Of AI Leaders Now Training Developers In Ethics, But 'Killer Robots' Are Already Being Built”	https://www.forbes.com/sites/johnkoetsier/2018/09/26/92-of-ai-leaders-now-training-d
23	Greene, Jason	2018	“Are Hosts, Replicants, and Robot Clones Closer Than We Think?	https://www.theringer.com/tech/2018/9/19/17877428/artificial-intelligence-immortality
24	Mlot, Stephanie	2018	“Activists Call for Sex Robot Regulations Amidst U.S. Brothel Launches”	https://www.geek.com/culture/activists-call-for-sex-robot-regulations-amidst-u-s-broth
25	Ogg, Terry	2018	“Roboethics and the Collision Regulations”	https://www.maritime-executive.com/editorials/roboethics-and-the-collision-regulation
26	Christian, Russel	2018	“Killer Robots Fail Key Moral, Legal Test”	https://www.hrw.org/news/2018/08/21/killer-robots-fail-key-moral-legal-test
27	Riek, Laurel; Howard, Don	2014	” A Code of Ethics for the Human-Robot Interaction Profession”	https://papers.ssrn.com/abstract=2757805

TABLE 5.1 – Most relevant media articles (basic information)

Analysis of selected media articles on the ethics of AI and robotics in United States of America– Basic information				
Articles focusing mostly on artificial intelligence				
Nr.	**Author(s)**	**Year**	**Type of source**	**Title, brief summary and URL**
1	Bowles, Nellie; Gelles, David; & Metz, Cade	2019	Newspaper	"What Did We Learn at the New Work Summit? A conversation amongst N Y Times tech and writers after a summit workshop on the future of ethical AI, specifically ″the relationship between artificial intelligence and human beings — and how or whether the creators of A.I. should be held to ethical standards." https://www.nytimes.com/2019/03/03/business/new-work-summit-conversation-recap.html?searchResultPosition=14
2	Metz, Cade	2018	newspaper	"Is Ethical A.I. Even Possible?" Discussion and analysis, including interviews with technology CEOs, etc, of the challenges that "ethical AI"will bring https://www.nytimes.com/2019/03/01/business/ethics-artificial-intelligence.html?searchResultPosition=19
3	Wakabayash, Daisuke	2018	newspaper	"Firm Led by Google Veterans Uses A.I. to 'Nudge' Workers Toward Happiness" An AI-based commercial product in use at Google and eslewhere that monitors and "nudges" employees to make them (putatively) happier. https://www.nytimes.com/2018/12/31/technology/human-resources-artificial-intelligence-humu.html?searchResultPosition=22
4	Atherton, Kelsey D.	2018	Newspaper's weekly magazine	"Are Killer Robots the Future of War? Parsing the Facts on Autonomous Weapons"

				Discussion of the current status quo re: autonomous wepaons and ethics of law of war; implications for autonomous ”decision-making” systems generally. https://www.nytimes.com/2018/11/15/magazine/autonomous-robots-weapons.html?searchResultPosition=28
5	Tugend, Alina	2018	newspaper	“The Commonality of A.I. and Diversity” Discussion and comparison of coinciding AI and diversity workshops https://www.nytimes.com/2018/11/06/business/dealbook/the-commonality-of-ai-and-diversity.html?searchResultPosition=30
6	Tugend, Alina	2018	newspaper	“Colleges Grapple with teaching the technology and ethics of AI” Looks at various colleges and universities and the AI or AI & ethics programs they are teaching or developing and why https://www.nytimes.com/2018/11/02/education/learning/colleges-grapple-with-teaching-ai.html?searchResultPosition=31
7	Vaggalis , Nikos	2019	Computer programming and tech news website	“Ethics Guidelines For Trustworthy AI” An annotated analysis od the European Commission’s (High-Level Expert Group on AI) guidelines on how to build AIs that can be trusted by society. https://www.i-programmer.info/programming/artificial-intelligence/12702-ethics-guidelines-for-trustworthy-ai-.html

8	O'Brien, Matt; Lerman, Rachel	2019	Insurance industry news website	"How Real Are 'Ethical Artificial Intelligence' Efforts by Tech Giants?" Critical look at "Ethical AI" as promulgated to claimed by big tech e.g. Google https://www.insurancejournal.com/news/national/2019/04/11/523460.htm
9	Johnson, Bobbie and Lichfield, Gideon	2019	University technology magazine website	"Hey Google, sorry you lost your ethics council, so we made one for you" In wake of Google dissolving it'snew ethics board, the article, gathers "a dozen experts in AI, technology, and ethics to tell us where the company lost its way and what it might do next." https://www.technologyreview.com/s/613281/google-cancels-ateac-ai-ethics-council-what-next/
10	Paulus, Michael	2019	Stand-alone Religious news and general interest website	"The Possibilities of AI Ethics" Urges the "need for an institutional ethical infrastructure that connects organizational principles, internal people and operations, and diverse external stakeholders and advisors. Ethics must be embedded throughout an organization and connect with the world the organization will impact." https://www.patheos.com/blogs/digitalwisdom/2019/04/the-possibilities-of-ai-ethics/
Articles focusing mostly on robotics				
Nr.	**Author(s)**	**Year**	**Type of source**	**Title, brief summary and URL**
1*	Carpenter, Carli	2016	Journal article	**"Rethinking the Political / -Science- / Fiction Nexus: Global Policy Making and the Campaign to Stop Killer Robots"** "an evidence-based exploration of the relationship between science-fiction narratives and global public policy in an important emerging political arena: norm-building efforts around the prohibition of fully autonomous weapons. Drawing on in-

				depth interviews with advocacy elites, and participant-observation at key campaign events, I explore and expand on constitutive theories about the impact of science fiction on “real-world” politics.” https://www.cambridge.org/core/journals/perspectives-on-politics/article/rethinking-the-political-science-fiction-nexus-global-policy-making-and-the-campaign-to-stop-killer-robots/0D8C4B8B0D0965800B1133DD0BE5B99A
2*	Maradin, Nicholas R.	2013	Journal article	“Militainment and mechatronics: *Occultatio* and the veil of science fiction cool in United States Air Force advertisements” ”This essay explores how themes essential to the science fiction genre play a role in influencing contemporary attitudes about autonomous and semi-autonomous robotic weapons, as well as the way in which the aesthetic and functional qualities of these advanced technologies are used to frame moral arguments about their use. https://link.springer.com/article/10.1007%2Fs10676-013-9316-3
3#	Atherton, Kelsey D.	2018	newspaper	“Are Killer Robots the Future of War? Parsing the Facts on Autonomous Weapons” Examines current status of autonomous weapons systems re ethics of war, and human responsibility. https://www.nytimes.com/2018/11/15/magazine/autonomous-robots-weapons.html?searchResultPosition=28
4#	Clark, Andy	2018	Newspaper op-ed	We Are Merging With Robots. That’s a Good Thing.” Editorial in support of ”augmented intelligence” and human /AI cooperation, hybridization, enhancement and expansion of possibilities; redefining what it means ot be huma https://www.nytimes.com/2018/08/13/opinion/we-are-merging-with-robots-thats-a-good-thing.html?searchResultPosition=44
5#	Turkle, Sherry	2018	Newspaper op-ed	“There Will Never Be an Age of Artificial Intimacy”

				Article criticizes current utopian views of robot companions; worries about humans diminishing themselves https://www.nytimes.com/2018/08/11/opinion/there-will-never-be-an-age-of-artificial-intimacy.html?searchResultPosition=45
6#	Joh, Elizabeth; Calo, Ryan; Welinder, Yana; Chavis, Kami N.	2016	Newspaper op-eds	"What Ethics Should Guide the Use of Robots in Policing?" https://www.nytimes.com/roomfordebate/2016/07/14/what-ethics-should-guide-the-use-of-robots-in-policing?searchResultPosition=66
7#	Markoff, John	2016	newspaper	"Should Your Driverless Car Hit a Pedestrian to Save Your Life?" Discussion of current ethical debate about driverless car avoidance behavior https://www.nytimes.com/2016/06/24/technology/should-your-driverless-car-hit-a-pedestrian-to-save-your-life.html?searchResultPosition=67
8	McIntyre, Liam	2019	Catholic news website	"Robotics needs ethical guidelines, speakers say at Vatican meeting" Reporting on Vatican-convened meeting on robotic ethics https://www.catholicnews.com/services/englishnews/2019/robotics-needs-ethical-guidelines-speakers-say-at-vatican-meeting.cfm
9	Koetsier, John	2018	Magazine website	"92% Of AI Leaders Now Training Developers In Ethics, But 'Killer Robots' Are Already Being Built" Contrasts ubiquitous attention to ethical design with milutary AWS efforts

				https://www.forbes.com/sites/johnkoetsier/2018/09/26/92-of-ai-leaders-now-training-developers-in-ethics-but-killer-robots-are-already-being-built/
10	Mlot, Stephanie	2018	Tech and culture news website	“Activists Call for Sex Robot Regulations Amidst U.S. Brothel Launches” Reporting on current event topic of robotic brothel in Houston https://www.geek.com/culture/activists-call-for-sex-robot-regulations-amidst-u-s-brothel-launches-1752619

TABLE 5.2 – Most relevant media articles (ethical information part 1)

Most relevant media articles on the ethics of AI and robotics in United States of America– Ethical information (part 1)					
Articles focusing mostly on artificial intelligence					
Nr.	**Author(s)**	**AI and/or robotics**	**Products, systems and/or processes discussed**	**Application areas discussed**	**Ethical concepts, issues and values discussed & their timeline(s)**
1	Bowles, Nellie; Gelles, David; & Metz, Cade	AI and robotics	Various, including privacy digital assistants, facial recognition, military drones, autonomous cars	Transportation, healthcare, military, finance, various	Human rights, transparency, explainability; labor Immediate, 5 & 10 year timelines
2	Metz, Cade	AI	Facial recognition, language recognition, video analysis; drones; weapons	Military, healthcare, shipping; research, surveillance, journalism	Human rights; sources of regulation; research principles. Immediate – 5 years
3	Wakabayash, Daisuke	AI	Big data, analytics	Labor, healthcare, surveillance, insurance	Human rights, labor, ethics, panopticon immediate
4	Atherton, Kelsey D.	AI and robotics	Drones, weapons, robots,	Military, drones, international law,	Law of war; ethical war; human rights. Immediate to 5-10 years
5	Tugend, Alina	AI	Big data, algorithmic decision-making; explainability	Labor, diversity generally; research; gornment support	Ethics of diverse hiring; immediate
6	Tugend, Alina	AI	AI broadly, technology and philisophy	Education, labor, ethcis	Role of educational institutions; immediate + 5 year

7	Vaggalis, Nikos	AI	Ethical, trustable AI systems broadly	Military, labor, finance, medicine, human rights, etc.	Government guidelines, immediate to 10 year timeline.
8	O'Brien, Matt; Lerman, Rachel	AI	Ethical AI generally	Insurance; big tech companies; ethics boards; transparency	Private ethical codes; immediate to 5 year timeline
9	Johnson, Bobbie and Lichfield, Gideon	AI	Ethical AI generally; ethics boards; human rights controversies	Big tech; governance, role of public, human rights	Private ethical codes; immediate to 5 year timeline
10	Paulus, Michael	AI	Ethical AI generally, possibilities and needs	Big tech, regulation; human rights imperatives	Research and ethical codes, immediate to 10 year timeline
Articles focusing mostly on robotics					
Nr.	**Author(s)**	**AI and/or robotics**	**Products, systems and/or processes discussed**	**Application areas discussed**	**Ethical concepts, issues and values discussed & their timeline(s)**
1	Carpenter, Carli	robots	Autonomous military robots & weapons	Military	"humans in the loop"; rules of war; ethical kiling. Immediate to 5 year timeline
2	Maradin, Nicholas R.	Robots	Autonomous military robots & weapons	Military; popular acceptance	"humans in the loop"; rules of war; ethical kiling. Immediate to 5 year timeline
3	Atherton, Kelsey D.	Robots	Autonomous military robots & weapons	Military; popular acceptance; ethics of use	"humans in the loop"; rules of war; ethical kiling. Immediate to 5 year timeline
4	Clark, Andy	Robots	Robots generally,especially those interacting directly with or assisting humans	Medicine, sport, home care, art	Nature of humanity; aspirational humanity; openmindedness to change. Immeidate to 20 year timeline
5	Turkle, Sherry	Robots	Human- assistive robots, homecare, medical; "companion" robots	Medicine; home care, general life and culture	Nature of human interaction; flaws in human society and ethical frameworks. Immediate to 20 year timeline
6	Joh, Elizabeth; Calo, Ryan; Welinder,	Robots; AI	Bomb-defusing robots and weaponized drones	Law enforcement; anti-terrorism	"human in the loop"; human rights; law of agency Immeidate to 5 year timeline

	Yana; Chavis, Kami N.				
7	Markoff, John	Robots; AI	Driverless cars	Transportation, labor, human rights	Agency law; markets; insurance; utilitarianism Immeidate to 10 year timeline
8	McIntyre, Liam	Robots	Robotics generally	Various; e.g., manufacturing, medicine, surgery, elder-care and in the service industry.	Human rights; ethics; decision-making and nature of humanity. Immediatwe to 10 year timeline
9	Koetsier, John	Robots, AI	AI ethics; autonomous weapons	Military; tech; customer service; labor	Human rights, ethics, military. Immediate
10	Mlot, Stephanie	Robots	Sexual robots	Companionship, therapy, medicine, sexwork	Human rights, business regulation; labor; safety

TABLE 5.3 – Most relevant academic articles (ethical information part 2)

Most relevant academic articles on the ethics of AI and robotics in United States of America – Ethical information (part 2)			
Articles focusing mostly on artificial intelligence (AI)			
Nr.	**Author(s)**	**Main finding(s)/message(s) in article**	**Additional comments**
1	Bowles, Nellie; Gelles, David; & Metz, Cade	• Ethical AI very complicated from an industry perspective • Wide spectrum of opinions in tech world re: “Ethical” • Imminency of AI-related change maybe overblown, but agreement on labor displacement	Although this is a short piece, I chose it because it has a strong US focus, and is in a way a capstone for a substantial amount of NYTimes coverage, and can lead outward usefully whether through participating writers or links.
2	Metz, Cade	• Necessity of goverment regulation • Power and reach of new AI technologies • Implications of bias	Chosen because it an almost entirely critical piece, with little to no pure optimism about immediate future of ethical AI
3	Wakabayash, Daisuke	Data-driven employee monitoring and manipulation/”nudging”	Chosen because it describes a real-world product currently in use that has massive ethical implications in a range of topic areas; presented almost uncritically.
4	Atherton, Kelsey D.	• Moral challenges of autonomous weapons • ”human in the loop” • US current focus; intl outlook	Chosen because it’s representative of the most common paper topic my searches found in academic

			literature; references broader ethical questions
5	Tugend, Alina	• Tools built with biased data or by the biased will be biased without conscious effort to eliminate it • There can and should be useful partnerships between tech companies and govt. • Transparency and explainability are critical. • Diversity efforts and ethical AI efforts have a lot in common	Looks at ethical AI in a broader workplace context; features real-world examples of indivudals and companies grappling with AI challenges
6	Tugend, Alina	• Colleges and universities see a strong demand for AI programs • The need to make them more than just tech is clear • AI classes themselves need ethical curricula	Address AI as a societal topic early on, educating the next generation of practitioners
7	Vaggalis, Nikos	Thoughtful, detailed analysis of guidelines and their implications, with examples	Critical analysis of Govt guidelines.
8	O'Brien, Matt; Lerman, Rachel	• Critical look at "Ethics washing" by big tech • Role and utility of corporate ethics boards	Interestign because of the industry website publishing it; because of largely skeptical stance
9	Johnson, Bobbie and Lichfield, Gideon	• Addresses Google's Ethics Board controversy • Offers more workable.palatable alternatives from sector experts and analysts	In MIT's Technology Review; directly addresses an ethics controversy of the moment; offers alternatives
10	Paulus, Michael	• Advocates for acknowledgment of differences, but stresses need to reconcile them • a shared vision of the future—which we desperately need—requires us to clarify and explore together our diverse beliefs and hopes.	Interestinfg because published on religiously themed website; aspirational as to inegrated multi-stakeholder approach
Articles focusing mostly on robotics			
Nr.	**Author(s)**	**Main finding(s)/message(s) in article**	**Additional comments**
1	Carpenter, Carli	Science-fictional narratives and their popular acceptance affect real-world ethical frameworks and policy-making	"One of the few results from media study" search that arguably was about media and AI

2	Maradin, Nicholas R.	science fiction plays a complex role in influencing public attitudes towards military technologies, and the military deliberately takes advanatge of that in recruiting.	Directly addresses a major AI stakeholder's manipulation of media re: popular acceptance of AI
3	Atherton, Kelsey D.	Factual examination of status quo in US military re AWS	Provides pro and con arguments for autonomous weapons; examines morality
4	Clark, Andy	Robots represent an unprecedented opportunity for the evolution of the human organism, and this should be embraced.	A remarkably positive an open-minded article about systemic changes to what it means to be human; bordering on science fictionl unusual for its publication.
5	Turkle, Sherry	Companion robots will impoverish human relationships, and should not be seen as a susbtitute or improvement, but rather as an indictment of human relationship ethics	Turkle is a well-known anthropologist; has strong opinions abotu effects of technology on human relationships
6	Joh, Elizabeth; Calo, Ryan; Welinder, Yana; Chavis, Kami N.	A spectrum of legal and AI expert opinions on police using a robot to kill a gunman	Useful specturm of opinion by several experts on a real set of recent facts re: using a robot to kill
7	Markoff, John	Discussion of ethical debate about driverless car collisions	Typical article about one of th emost popular AI/robot topics
8	McIntyre, Liam	Catholic leaders convene expert workshop on robotio ethics, have many concerns	Interesting mostly because of the religious factor – who is paying attention to these issues.
9	Koetsier, John	Stark contrast between ethical intentions of AI leaders in tech and elsewhere with reality of AI and robotic weapons	Calls attention to paradoxical nature of status quo on robots and AI; big companies not monolithic; interestign

			because in a finance, business and news magazine
10	Mlot, Stephanie	Covers a range of opinions (including neddlessly salacious) on the appropriateness of robot brothels	A seemingly prurient issue getting a great deal of attention that nevertheless has a variety of serious aspects and repercussions

REPORT on media analysis

Although I was unable to find any true academic media studies related to AI or robotics, there is a wealth of material readily available in the English language popular literature found on the web on virtually any subject even remotely associated with AI or robotics. It seems clear that both topics are very "en vogue" and that most publications of whatever size see value in articles, op-eds and even longer analytical pieces, but the trend is toward a wide range of subjects with only superficial detail. It may well be the case that the facts are changing too fast or are too complicated, or both, for popular media to do any kind of in-depth analysis yet.

Unsurprisingly, an "ethics" related search returns articles that for the most part focus on the effort of the largest technology firms to come to grips with the ethical implications of AI and robotic technology, with secondary attention to what those effects might actually be. The articles therefore tend to take a very high-level "meta" approach, pointing out that companies, governments and individuals are thinking about ethics and why; or they address the more sensational ethical conundrums of a particular technology or use case.

With respect to AI and ethics, the popular media coverage of the topic runs the gamut of topics from hiring practices, education and replacing low-wage workers to military decision-making, facial recognition and immigration, next-generation finance and much more. Legal issues are mentioned, but usually in a secondary fashion or as an afterthought, with the exception of when legal scholars are asked to comment on larger issues. The primary social issues mentioned are displacement of human labor and bias and discrimination in all forms, most notably in facial recognition and hiring, as well as law enforcement and criminal justice. Science fictional "AI overlords" narratives are also quite common, but more recently, appear to be mentioned as inaccurate or overblown rather than as possible or feared futures.

With respect to robotics, there appears to be less coverage in general, simply in terms of numbers of articles, which may be because "AI" serves as a more useful umbrella term for hybrid technologies such as driverless cars. Discussion of military autonomous weapons and the ethics of their use dominates popular media coverage, perhaps because it is so potentially sensational. Driverless cars are also a prominent feature of the media landscape. After that, robot companions, whether recreational or medicinal, are probably the next most common topic. The effect of ubiquitous robots on the workforce, typically in manufacturing, driving and the service and medical industries, is the most common social issue, while liability for harm is the most commonly mentioned legal topic.

Methods

Using Google scholar and following the instructions provided, I conducted a series of searches for media studies articles on AI and robotics. For the robotics topic, I began with the search string "media coverage robotics ethics United States," which produced only a few U.S.-related results worthy of inclusion. I also searched using the strings "United States media coverage of robot ethics," "media AND robotics AND ethic*", and "media studies robotics AND ethic* "but these produced even fewer specifically "media studies"-related results, or even none at all, although they did result in many interesting results on ethics and robotics generally on a broad range of topics and intriguingly, again some results addressing nanotechnology.

Analogous AI-related searches were even less fruitful. I searched “United States media artificial intelligence ethics,” “United States media studies artificial intelligence ethics,” “media AND artificial intelligence AND ethic*, and “media studies artificial intelligence AND ethic*”, but found little or nothing, although again, there were many likely interesting results about AI & ethics broadly, including some results that had appeared in the academic searches earlier in this report.”

Given this paucity of relevant results for media studies, I expanded my search in two ways, per the amended instructions, to include results from “newspapers, magazines, books, online publications, etc.” First I conducted a search on the New York Times website using its internal search function. I chose this paper as the US “national paper of record” and also because the NY Times maintains a dedicated technology section, including "Bits," a subsection dedicated to “insight and analysis on Silicon Valley and the technology industry.” I searched, respectively, “artificial intelligence ethics” and “robotic* ethics” and sorted the list of results by date, selecting the 10 newest on each topic that appeared to best fit the report’s criteria. I also included the “full” link from the search engine because it shows that particular article’s position within the results.

With an eye toward comprehensive broad-spectrum media inclusion, I then combined these results with results from an active resource I maintain of media mentions of AI&R on a few topics, that I then curate according to topic. Since approximately May 2018 I have had Google News Alerts set for the following: “artificial intelligence ethics,” “artificial intelligence criminal justice,” artificial intelligence human rights,” “robot ethics,” and “regulation robot”. These searches produce several articles or more every day, some of which show as results in multiple alerts. I then sort the articles into a series of Zotero folders based on topic(s). As of April 29, 2019, I have approximately 1000 articles cataloged, with approximately 15% of those in the “Ethics” folder.

For the purposes of selecting I sorted these by date and then selected the most recent having to do with AI &R that appeared to best fit the instructions criteria, adding them to the results from the NY Times search, in the hopes of adding a broader base of online publications.