Private and Academic AI Collaboration: Opportunities and Challenges to Open Science in the US

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Abstract. Academic scientific research is undergoing a transformation in many respects. One relevant aspect is that it has become common practice for companies and private actors to fund and support scientific research. The field of scientific research in Artificial Intelligence provides an illustration of this phenomenon. The article, which adopts a US perspective, aims to provide an overview of the advantages and disadvantages of this phenomenon particularly in light of the Open Science approach. A particularly relevant consequence on which the investigation focuses is the handling of personal data and privacy management in academic research projects involving the development of AI systems funded by companies and private actors.

1. Introduction

Across the US, the phenomenon of private companies funding and supporting academic scientific research has become common practice. In recent years, this common practice has become prevalent in the realm of Artificial Intelligence (AI). A relatively small number of AI tech companies invest a vast amount of money into private and public academic institutions to further develop this booming field focusing on policy, legal and technical issues. A study from 2020 found that "58 percent of faculty at four prominent universities have received grants, fellowships, or other financial support from 14 tech firms" (Knight, 2020). Another example could be found in a recent partnership established in 2022 between the University of Florida and the tech company NVIDIA to create "AI universities" to "spur US innovation and competitiveness in AI" (Omaar, 2022).

This Article focuses on this type of prevailing practices in the US and the opportunities and challenges they hold. It presents the advantages of blurring the line between AI research in academia and the industry along with its negative aspects, focusing on the threat to academic integrity (Abdalla & Abdalla, 2021; Johnson, 2020) and the hurdles these types of collaboration will present to preserving and promoting an Open Science approach in the US.

In the growing field of AI the line between academia and tech companies is increasingly blurring. AI professors obtain funding for their research from giant tech companies such as, Google, Meta, Amazon, IBM and Microsoft, to name only a few (Etzioni 2019). Another aspect of this blurry line comes in the form of AI professors consulting companies on a weekly basis, as well as AI tech giants providing resources to further AI research at the university level. Though these types of collaboration help inform AI academic scholars' research and teaching[1], it might also lead to long-term harms within the academic community, chiefly compromising academic integrity as well as pushing against the movement for Open Science in the US.

This article aims to delve into this ongoing process of mutual influence between AI academics and AI tech companies through an American lens. It argues that though there could be benefits to academia, this process presents serious challenges to AI academic scholars as those operate to conduct objective AI research while receiving funds from private AI companies. The article continues as follows: Section 2 provides an overview of the current practices of AI companies interacting with AI academics' research. Section 3 will then explore the opportunities these types of cooperation hold to the AI field as a whole while focusing on the advancement of AI innovation. Section 4 will examine the challenges presented by this aggressive cooperation concentrating on the issues of academic integrity (Section 4.1), obstacles to the Open Science movement in the US (Section 4.2) and data protection and privacy concerns (Section 4.3).

2.   Private Funding and AI Scholarship

The division between AI research orientated from academics and their counterparts in the private industry has become indistinct over the past decade. It has been claimed that big tech companies are essentially draining AI talent from academia (Woolston, 2022). In most cases, big-tech companies can offer higher salaries than what academia can. This shift is raising concerns in the academic world focusing on its ability to maintain quality workforce, competition, intellectual freedom as well as maintain its "ethical expertise" (Woolston, 2022). A recent paper published in 2021 focused on research affiliation of authors in about 800,000 AI papers, published between 2000–2022. It found that top researchers from academia have been moving to the industry throughout the last decade (Jurowetzki, et al., 2021). This hampers AI research in

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[1] Referring to Professors teaching AI in universities, distinguished from AI researchers working in the private market.

some ways as AI researchers who work in the industry need to balance their academic integrity in their research with their employers' interests. This, however, is not unique to the AI industry. Academia researchers might also have to balance their research with their need to get funding (Jurowetzki, et al., 2021)[2]. That funding might also come from the industry itself, creating a significant problem in the sphere of academic AI researchers on two separate, but interconnected, fronts – academic integrity and access to the scientific outcomes and respect of the Open Science tenets.

Moreover, there are a lot of academia-industry collaborations where big-tech companies are "scaling up their support to help academic research groups facilitate fundamental research with more funding, data and compute resources" (Synced, 2019). On top of that, many professors in academia are being offered senior researcher positions at industry labs, which allow them to continue teaching at universities. These private actors don't only have the required funds to lure talent to go through the revolving academic-industry door, they also have the data which is essential to be able to carry out research projects. That would be impossible, or at the very least extremely challenging, to collect at a public research organization (see, for instance: Schneider, 2019). Though this allows these professors to continue to train the next generation of computer scientists and AI researchers, these types of collaboration raise concerns regarding their academic integrity and their ability to freely publish papers which are accessible to all.

3.   The Opportunities: Advancing AI Innovation

A recent example for this type of collaboration could be found in the industry-university partnership between the University of Florida (UF) and the AI tech-company NVIDIA. This partnership was framed as a model to "spur U.S. innovation and competitiveness in AI" (Omaar, 2022). As a result of this collaboration, UF launched an initiative to become an "AI University" (Omaar, 2022). According to a report published by the Center for Data Innovation, that "has significantly increased its ability to conduct impactful AI research, educate the Floridian workforce, and help ensure all individuals have equal opportunity to succeed in becoming the next generation of AI researchers by sharing its AI resources with groups that are traditionally underrepresented in science and engineering" (Omaar, 2022). In other words, these types of cooper-

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[2] For more on this brain drain phenomenon from academia to industry see (Etzioni, 2019).

ations have the potential to increase equity in the field of AI research and promote access of underprivileged communities to AI education.

Furthermore, the goal of these types of partnerships often includes strengthening AI education and workforce development and advancing AI research at a specific university (Omaar, 2022), which is usually lacking. The report discussing the UF-NVIDIA collaboration stated that it had great impact on AI research and AI education, such as, diversifying AI research at the university level, and increasing tertiary AI education options (Omaar, 2022). It is important to emphasize that the funds leading to the collaboration were given to UF under a general umbrella definition to accelerate AI research. But once funds are allocated into specific avenues of research, these general benefits are less achievable.

More generally, the report also details a couple of reasons why the US is uniquely positioned for university-industry collaborations, unlike other countries. First, the culture in the US of a "long tradition of pragmatism" has led universities to view collaboration as a tool to advance knowledge (Omaar, 2022). Second, the unique landscape of US academia, comprised of a variety of universities, both public and private, created a competitive environment where universities strive to innovate in an effort to appeal to a variety of students and offer a good starting point to those who wish to work with the industry. Lastly, different states encourage and support public colleges and universities to work closely with the industry[3]. These reasons, among others, are representative of the approach American academic institutions take once considering collaborating with private sector AI companies. It gives them, and their students, a competitive edge in recruiting students into the private sector and ensuring their placement in pivotal positions within the industry.

These types of collaborations essentially highlight the immensely important role of the market system and the importance of collaborations as part of it. In his book, Nielsen presents the example of the Soviet Union to illustrate the importance of the market to the progress of science (Nielsen, 2020). Despite the fact that the Soviet Union had a renowned scientific research system, it did not have a market to collaborate with, thus it was unable to distribute its scientific innovations directly to its citizens. The role of science in society is thus critically connected to the role of society's institutions, such as the market. Without a well-functioning market, even the best research systems are simply not enough to drive innovation and societal wealth. This is a significant advantage to the collaborations currently ongoing in the AI world.

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[3] See e.g., Federal Policy, SSTI, `ssti.org/federal-policy`.

4. The Challenges

However, the academic-industry collaboration glass is only half full. Collaborations with the AI industry comes with strings and limitations that impede academics and their research. This part delves into two main challenges presented by industry-academia AI collaboration – compromising academic integrity and accessibility to valuable AI research.

4.1. ACADEMIC INTEGRITY

In 2020, Mohamed Abdalla and Mustafa Abdalla co-authored a paper highlighting the number of AI researchers in top Universities – including those who work on ethical issues raised by technology – who receive funding from the private sector (Abdalla & Abdalla, 2021). It is important to emphasize that having external funding doesn't necessarily mean AI researchers working in academia are acting unethically. It does mean that there is an increase concern their funding could bias their research, even unconsciously (Emerson, 2017).

The co-authors go even further by comparing big tech funding for AI research today with tobacco companies practice in the 1950s to pay for research regarding the health effects of smoking (Johnson, 2020). Focusing on AI ethics, the co-authors argue that private industry is involved and, in some cases, even leads ethics discussion in different academic settings (Abdalla & Abdalla, 2021). Comparing big-tech's response to public criticism to that of big tobacco's, the paper finds similarities as both invested enormous sums of money in researching the causes of said criticism (Abdalla & Abdalla, 2021). The first criticism refers to the exploitation of users data while using AI (e.g., the Facebook-Cambridge Analytica scandal) (see: Confessore, 2018), while the latter refers to the effects tobacco usage has on one's health and their environment.

Given these similarities, the paper continues, caution must be taken with regards to these financial contributions and further exploration must be carried out as to the underlying motivations, interests, and conflicts of interest of these big-tech companies. These funds can nudge scholars into a certain direction and in fact set up their research agenda – "by providing a large amount of money to researchers, Big Tech is able to decide what will and won't be researched" (Abdalla & Abdalla, 2021).

The article finds that 58% of AI ethics faculty are soliciting big-tech's money, thus enabling them to dictate certain aspects of it (Abdalla & Abdalla, 2021). Finally, the paper calls to start a vibrant discussion

about "the appropriateness and tradeoffs of accepting funding from Big Tech, and what limitations or conditions should be put in place"[4].

Private funding by the industry doesn't only influence academic research, but also impacts the content of scholarly conferences (Abdalla & Abdalla, 2021). For example, since 2015, NeurISP, a top machine learning conference, "has had at least two Big Tech sponsors at the highest tier of funding"[5]. This is also true with regards to most AI conferences focusing on AI ethics and fairness, where at least one organizer is, or recently was, affiliated with big tech. Even in conferences focusing on the societal effects of AI, outside of the technical realm of AI, big tech's sponsorship is persistence[6]. In light of this rather common practice, "by controlling the agenda of such workshops, Big Tech controls the discussions, and can shift the types of questions being asked and the direction of the discussion" (Abdalla & Abdalla, 2021).

As we have seen above, there is nothing new about academic research receiving funding from industry. In the US, this constant flow of intellect, money, and researchers from one side to the either is considered a part of a "vibrant innovation ecosystem" (Knight, 2020). However, the large scale, size and grasp today's tech companies have "wield unprecedented power" (Knight, 2020). Combined with the immense importance the private sector sees in the cutting-edge technology of AI, these cross-collaborations are becoming problematic, to say the least. They have the potential to harm academic integrity as researchers might seek to manipulate or even shelf research that is not aligned with the interest of their sponsors.

4.2. OPEN SCIENCE

Industry-academic collaborations could also present proprietary concerns that might prevent access to research resulting from industry funded AI research. This will surely impede the Open Science approach attempting to ensure scientific research is accessible to all. Open Science refers to the notion of making scientific research and data freely available to the public, with the goal of promoting transparency, collaboration, and reproducibility (Paseri, 2022). It encompasses a range of practices, including open access publishing, open data, and open

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[4] They attempt to offer a few initial steps including requiring researcher to publish their funding information; Universities should publish a clear policy about funding from the industry etc. (Abdalla & Abdalla, 2021).

[5] "Sponsor Information for NeurIPS 20XX" page for each conference (e.g., `nips.cc/Sponsors/sponsorinfo`).

[6] For example, sponsorships for the FAccT conference. See "Sponsors and Supporters" page for each conference (e.g., `facctconference.org/2020/sponsorship.html`).

research methods (Vicente-Saez & Martinez-Fuentes, 2018; Bartling & Friesike, 2014; Levin et al. 2016; Willinksy, 2005; Besançon et al., 2021). The EU has emphasized Open Science significantly more than the US and it is supported by EU policy via several initiatives, including the European Open Science Cloud (EOSC)[7]. Though the US has embraced Open Science, some challenges persist. Chiefly is the cost of making research available as many scholarly journals set a paywall to gain access to their articles (Dixon-Luinenburg, 2022). To address this issue, the US government has implemented policies that require federally funded research to be made freely available within a certain time frame after publication (Brainard & Kaiser, 2022). However, the implementation of these policies has been inconsistent and there are still many barriers to access research (Bahlai et al., 2019). Given the weaker defenses in place as of now in the US, there is a real concern that further private-academic collaboration will continue to impede the successful implementation of an Open Science approach into American academia.

Imagine the following scenario: an AI faculty expert at a top American university conducts research using funds from one of the big tech companies which hold a significant share of the current AI industry. Imagine also that the research results present that a certain algorithm that the private company is currently developing is likely to be biased against minority groups or have a specific vulnerability that might lead to substantial privacy harm. It is clear the private company has a strong interest in avoiding the publication of such research as it tarnishes its reputation and brand. Even if it decides to scrap that algorithm or proactively attempt to fix these defects, the fact it was not made public means other companies might replicate that algorithm and not necessarily track the harms associated with it on time. This means valuable information will be blocked for the sake of protecting the share value of these big tech companies.

A similar scenario happened in 2020 when Timnit Gebru, the co-lead of Google's ethical AI team at the time, claimed that the company forced her out of her position after she demanded to publish a paper, but Google objected (Hao, 2020; Metz & Wakabayashi 2020). The paper was co-authored by 6 authors, 4 of them are Google researchers, and at least one is a professor operating solely in the academic world, showing how ties with the industry might prevent important publications. The article in question discussed the possible risks involved in the usage of large language models (such as ChatGPT). These might include environmental and financial costs and inscrutable models (Metz & Wakabayashi 2020). Though the professor could identify herself given that she is a

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[7] See: `eosc-portal.eu/`.

tenured professor and enjoys 'academic freedom,' her work is still being concealed by the big tech industry. This is but one alarming example that has been made public of how private AI companies can potentially manipulate and control the content of AI ethics research. This will worsen the tighter grip these companies will have via their funding over private and public universities across the US.

4.3. Data Protection and Privacy Concerns

The intermingling of private actors, including companies as well as public actors, such as universities, in the field of AI research has become increasingly common. This collaboration brings together different resources, expertise, and perspectives, fostering innovation to advance this field. On top of the concerns detailed above, it also raises important concerns, particularly regarding the processing of personal data for scientific research purposes. In the United States, the handling of personal data is subject to various laws and regulations. One of the interesting regulations governing personal data is the California Consumer Privacy Act (CCPA), which came into effect on January 1, 2020. The CCPA grants certain rights to California residents regarding their personal information and imposes obligations on businesses that collect and process this data. It applies to both private companies and public entities, including universities, if they meet specific criteria such as conducting business in California and meeting certain revenue thresholds. Under the CCPA, personal information is broadly defined and includes data such as names, addresses, email addresses, and online identifiers. It gives individuals the right to know what personal information is being collected about them, the right to request deletion of their personal information, and the right to opt out of the sale of their personal information. The CCPA is a state level legislation. Nothing similar to it exists on a Federal level in the US and overall privacy regulation in the US is considered rather feeble (Whitman, 2004).

When private companies and public universities collaborate in AI research, they must navigate privacy regulations carefully. They need to ensure that any personal data they collect, process, or share is done in compliance with applicable laws and regulations, including obtaining necessary consent from individuals, implementing appropriate security measures, and providing transparency regarding data usage – which are mostly required by the CCPA in California, but should be encourages elsewhere as well. To facilitate such collaborations and address privacy concerns, entities may establish data sharing agreements, research partnerships, or institutional review boards to oversee data usage and ensure compliance with legal and ethical standards. Additionally, universities

often have internal policies and committees dedicated to ensuring research integrity and ethical conduct (National Academies of Sciences, 2017).

It is important for researchers, whether from private or public institutions, to be aware of the legal and ethical considerations surrounding personal data processing in their AI research. They should stay up to date with the evolving regulatory landscape and seek legal guidance or ethical reviews when necessary to ensure compliance and protect individuals' privacy rights. Many interests, rights, and values are at stake. For instance, think about machine learning's potential threat to the anonymity of personal data. Machine learning algorithms excel at pattern recognition and can effectively analyze vast amounts of data, potentially uncovering information that could compromise anonymity. Anonymizing personal data is crucial for protecting individuals' privacy and ensuring that their identities are not revealed through data analysis. However, the effectiveness of traditional anonymization techniques can be undermined by the power of machine learning. This risk is particularly relevant when multiple data sources are combined, or when seemingly unrelated datasets are linked together. By cross-referencing different types of data, machine learning algorithms can potentially re-identify individuals or extract sensitive information. The risk is even greater when there is no certainty about data ownership or, more generally, when different actors, both public and private, are involved.

Against this backdrop, despite what may appear at first sight, adopting the principles of Open Science can help. Open Science never intends to favor indiscriminate openness; the purpose is for scientific research to be "as open as possible, as closed as necessary". As already argued by Crosas, Honaker and Sweeney (Crosas, Honaker and Sweeney, 2014), it is crucial for scientific research to be able to take full advantage of the processing of data, including personal data, following the principle of transparency (Minssen, Rajam Bogers, 2020). Thus, the first step is to proceed by "assessing the sensitivity of the data" (Crosas, Honaker and Sweeney, 2014), to demonstrate an accountable approach. While progress has been made in data protection practices, there have been instances where breaches or mishandling of personal data have occurred in the private sector. Such incidents underscore the need for continued vigilance, strong governance, and ongoing audits to ensure compliance with privacy regulations and the ethical handling of personal data. It is important for individuals and organizations to stay informed, engage in due diligence when participating in clinical trials or sharing personal data, and advocate for strong privacy safeguards to hold the private sector accountable. The management of personal data by private com-

panies participating in research projects led by or with the participation
of public actors, e.g., universities, should align with ethical principles,
legal requirements, and best practices for data privacy. Collaboration
between private and public entities should be guided by mutual respect
for privacy, transparency, and responsible data handling to ensure the
protection of individuals' personal information. Often the asymmetric
distribution of power between scientists and private actors can be a
bottleneck (Durante, 2021). Institutions come into play here, insofar as
a rethinking of research governance is essential to embrace the principles
of transparency, collaboration, cooperation, openness and inclusiveness,
cornerstones of the open science approach.

5. Conclusions

In 2020 the documentary "Coded Bias" was released[8]. This documentary
examined the entrenched biases in facial recognition software, which
were exposed by MIT Media Lab researcher Dr. Joy Buolamwini. In the
movie Dr. Buolamwini states that considering the fact that large tech
companies are the one funding AI research, if you do "work that chal-
lenges them or makes them look bad, you might not have opportunities
in the future".

It is clear that it is easier to conduct research in the private sector
than it is in academia given the vast resources and time (i.e., not
teaching) researchers have in the former over the latter. Notions of
bias, fairness and environmental impact of AI have grown from the
academic side of the research and were fairly adopted and implemented
by the industry. According to a conversation I had with an AI re-
searcher, currently working in the private sector, that has changed a bit
in the last year, especially given Large Language Models (LLM) such as
OpenAI's ChatGPT. Unlike OpenAI's DALE-E and DALE-E 2 where
OpenAI's researchers published papers explaining the neural network
working behind it (known as CLIP (Contrastive Language-Image Pre-
Training)) rather quickly (Ramesh et al., 2022), such papers were only
recently published in the realm of LLMs (OpenAI, 2023). Nonetheless,
given their exponential development and advancement, it is likely that
these papers will be outdated rather quickly, especially considering the
potential negative implications of using LLMs given their scope[9].

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[8] Coded Bias (Shalini Kantayya Film 2020).

[9] For more on the concerns surrounding these LLMs see, The A.I. Dilemma
(2023), `www.youtube.com/watch?v=xoVJKj8lcNQ&ab\_channel=CenterforHum`
`aneTechnology`. Introducing Bard as a competitor for ChatGPT4,`bard.google.com`

Other companies are currently working on these LLMs, such as Amazon, Google[10], and Meta. Given this, there is currently an ongoing "race" between these companies. Recently Snapchat entered this race with its 'My AI' feature[11], which enables its users to chat with a bot. This might very well be a 'race to the bottom' that leads to secrecy in AI research given the financial interests and business strategy different big-tech companies have (Metz & Weise, 2023). OpenAI's lag in publishing its research following the massive attention ChatGPT has been getting around the world since its launched in November 30, 2022, (Knight, 2022) including the launch of ChatGPT4 in March 14, 2023 (Derico & Zoe Kleinman 2023), could be a result of many reasons, such as a desire to continue to develop their current models before feeling ready to publish them. However, this race is presumably an important reason that might be taken into consideration.

Nonetheless, there is a silver lining. Researchers working in the industry, and probably in academia as well, have an incentive to make sure information and research is not locked in cages. They strive to make it free, public, and accessible to all. Thinking about their next professional step, they are pushing for Open Science, and opposing registration of patents due to their personal interests. It is clear that the big-tech companies strive to keep at least certain aspects of their research hidden for businesses reasons. Even so, this industry is made of people, not companies. Striving for a more transparent AI industry is embedded in the work of AI researchers everywhere. This has the potential to start a grassroots movement within academia, including academic scholars working in the commercial sector, to set up best practices norms with regards to AI research in the private sector, especially given the sensitivity of their cross-industry appointments. We can definitely envision a future in which AI researchers will be the driving force of Open Science in the AI field in the near and far future and that they will use this force to make sure that even if the lines between academia and industry are blurry, the future of AI development is transparent and, in that sense, beneficial to the safety of society.

At the end of March 2023, more than a thousand tech leaders, researchers and others signed an open letter calling to apply a moratorium on the development of AI systems (Metz & Schmidt, 2023). The signa-

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most would say the currently Brad is way behind ChatGPT, see e.g., Murgia & Pedersen, 2023).

[10]   Introducing Bard as a competitor for ChatGPT4, bard.google.com/. most would say the currently Brad is way behind ChatGPT, see e.g., Murgia & Pedersen, 2023).

[11]   What is My AI on Snapchat and how to use it, SNAPCHAT SUPPORT, `help .snapchat.com/hc/en-us/articles/13266788358932-What-is-My-AI-on-Snapc hat-and-how-do-I-use-it-`; see, also: Hart, 2023.

tories of this open letter are individuals from across the spectrum of AI research, development, and teaching. There is a broad understanding that AI is embedded with unpredictable risks that should be shared to prevent, or at the very least mitigate, existential threats. Scholars working on both sides, academia, and industry, will play a pivotal role in ensuring the maximization of public and open AI research. In that sense, the fact that the line has been blurred could be considered a benefit as it enables more scholars to take a closer look at what the private sector is doing with AI and sound the alarm bell well in advance, similar to what this open letter tried to accomplish.

Given the way our market is built and works, it is impossible to completely resolve this issue. But, setting industry practices and norms that highlight the dual role these scholars play, on the side of both the universities and the AI companies, is one possible avenue to ensure that the integrity and accessibility of AI scholarship remains intact, or at the very least, untarnished. This emphasize the underlying formula of Open Science policies calling for a transparent discussion which is "as open as possible, as closed as necessary" (Landi, et al., 2020). This approach strives for an appropriate balance between legitimately opposing interests – market goals and public research purposes. I believe that this balance can be achieved in the AI research context, but the discussion about it must constantly be held as AI continues to exponentially evolve.

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