

Imagining a Future with Intelligent Machines

A Middle Eastern and
North African Perspective

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GLOBAL
AI NARRATIVES

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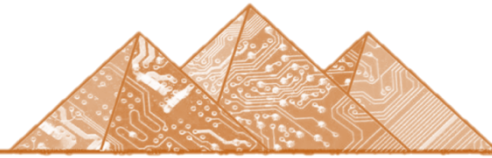
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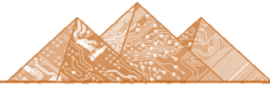
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Page 12 Illustration: 'The Elephant Clock,' Folio from a Book of the Knowledge of Ingenious Mechanical Devices by al-Jazari (public domain)

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Executive Summary

Narratives about intelligent machines can influence the development, adoption, reception and regulation of artificial intelligence (AI). The Middle East and North Africa (MENA) region is hugely overlooked by the Western mainstream when it comes to discussing the future of artificial intelligence. Recognizing the vital importance of diversity in the global debate on what AI is and should be, this report examines the narratives about technological futures spreading in the Arab world.

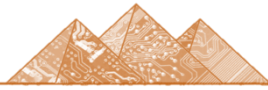
We identified several narrative threads as pivotal to the understanding of the Middle Eastern and North African conceptions of futures with intelligent machines. They include colonialism, visions of the utopian past (rather than future), contemporary political turmoil, as well as technological determinism and gender roles.

These are some of our key findings:

- Western perceptions of success, development, progress and industrialization strongly influence the hopes and dreams for the future of technology in the region.
- The history of imagining intelligent machines in MENA dates back to the Islamic Golden Age: a period of cultural, scientific, and economic flourishing, between the 9th and 14th centuries.
- Today, Islam does not feature in the wider discussion about AI's implications for society and culture in MENA.
- Contemporary grounds-up initiatives – start-ups or online communities, for instance – express local hopes for technological futures; top-down, government-orchestrated efforts to drive innovation, by contrast, often respond to Western conceptions of development.
- The regional perspectives on the future of work and automation are linked to existing questions on inequality and development.

- The anthropomorphization of both fictional and real AI in the region tends to reinforce gender stereotypes; robots are often imagined as servants, usually in the form of feminized domestic helpers – a tendency that raises further questions on the adoption of AI in relation to gender.

We conclude that the influence of narratives on the future of AI and other emerging technologies is significant in MENA. Compared with the Anglophone world, however, this influence is less explicit in the Middle East and North Africa, and uncovering it requires a nuanced approach, which takes into consideration not only directly expressed stories – novels, films, or media coverage – but also more elusive imaginaries – embodied by the local startup ecosystems or online communities of futurists, among others.



1. Introduction

1.1 AI Narratives Around the World

Millennia-old dreams of intelligent machines have shaped the hopes, fears, and expectations for contemporary AI technology. That narratives¹ have the power to affect the world in which they are produced and distributed can be seen, for instance, in the role science fiction has played in developing aerospace engineering, or the influence of Mary Shelley's *Frankenstein* on the public perception of genetic engineering. Similarly, narratives about intelligent machines can influence the development, adoption, reception and regulation of AI: this influence has been acknowledged in major publications such as the French National AI Strategy,² which references English-language science fiction, and the UK House of Lords report 'AI in the UK'.³

This report is part of a body of research on AI narratives originally developed at the Leverhulme Centre for the Future of Intelligence (CFI) at the University of Cambridge in the UK. The term 'AI narratives' in this context encompasses portrayals of life with intelligent machines in the broadest sense, including but not limited to robots, androids, and cyborgs - terms that in the popular imagination are often conflated with each other and with AI. The narratives under consideration can be fictional or nonfictional, and sources include literature, film, scientific and popular works, and news media.

The initial AI Narratives research project, conducted jointly by CFI and the Royal Society (UK) from 2017 to 2019, investigated the dominant Anglophone imaginings of a future with intelligent machines. It resulted in a range of publications for academic and non-academic audiences, including the book *AI Narratives: A History of Imagining Intelligent*

Machines (2020) and the report *Portrayals and Perceptions of AI and why they matter* (2018).⁴ The AI Narratives research revealed the imaginative sources of the utopian and dystopian visions of AI, and showed that a small subset of Western narratives has been disproportionately influential: the dystopian visions of humanoid robots in the films *The Terminator* (1984) and *I, Robot* (2004) have shaped perceptions of what AI is and could become. These visions in turn have shaped the implementation of AI technologies across the globe. From the twentieth century onwards, both those who have imagined fictional AI and those who have attempted to build it have been part of a narrow elite of mostly English-speaking white men. Yet, although much AI technology is developed in Silicon Valley, and many AI narratives are developed in Hollywood, the Anglophone West is not the only place to have imagined the existence of intelligent machines. In other cultures, different religious, linguistic, philosophical, literary and cinematic traditions have led to different conceptions of AI. Many of these worldviews are currently not given the attention they deserve. Following on from the AI Narratives project, CFI therefore launched the Global AI Narratives project, funded by the Templeton World Charity Foundation and DeepMind Ethics & Society, of which this report on AI narratives in the Middle East and North Africa (MENA) is a product.

The Global AI Narratives (GAIN) research project aims to build a global network of experts to analyze how different cultures and regions perceive the risks and benefits of AI, and the influences that are shaping those perceptions; to foster new thinking about AI around the world by disseminating and promoting narratives about AI from underrepresented regions and groups; and to connect local academic experts on perceptions and communication of AI with each other and with writers and artists around the world. Through a series of eleven workshops across the

¹ We define narratives as an 'ensemble of texts, images, spectacles, events and cultural artefacts that "tell a story"' (Bal, M. 2009 *Narratology: Introduction to the Theory of Narrative*, Toronto: University of Toronto Press).

² Villani, C. 2018 'For A Meaningful Artificial Intelligence'. AI for Humanity, https://www.aiforhumanity.fr/pdfs/MissionVillani_Report_ENG-VF.pdf.

³ Select Committee on Artificial Intelligence. 'AI in the UK: Ready, Willing, and Able?' London: House of Lords, 16 April 2018. <https://publications.parliament.uk/pa/ld201719/ldselect/ldai/100/100.pdf>.

⁴ Cave, S., Craig, C., Dihal, K., Dillon, S., Montgomery, J., Singler, B., Taylor, L., 2018. *Portrayals and Perceptions of AI and Why They Matter*. The Royal Society, London. <https://doi.org/10.17863/CAM.34502>

Cave, S., Dihal, K., Dillon, S. (eds.), 2020 *AI Narratives: A History of Imaginative Thinking about Intelligent Machines*, Oxford: Oxford University Press.

globe, the project mobilizes experts to explore how local narrative traditions shape popular hopes and fears for AI, and how these influence the development and implementation of AI technologies in their respective regions.

The Global AI Narratives MENA workshop took place in Cairo on Sunday 13 October 2019. CFI partnered with the Access to Knowledge for Development Center (A2K4D) at the American University in Cairo's School of Business for this interdisciplinary colloquium, which was followed by a public panel at A2K4D's annual workshop on 14 October. The workshop (see Appendix 1 for details) was divided into four themed panels, with participants contributing either in English or in Arabic:

- AI Narratives: Views from the West
- AI and Popular Culture: Contemporary Perceptions in North Africa and the Middle East
- Intersectionality and AI in the Arab World
- Is there an Arab Futurism? Conceptualizations and Future Studies of AI in the Region

These four panels were followed by a breakout session, during which the participants discussed key takeaways from the workshop, as well as ideas for future steps – which we will discuss in the conclusion of this report.

This report traces a long history of narratives in the region, and the way they have influenced contemporary sociotechnical imaginaries – defined as 'collectively imagined forms of social life and social order reflected in the design and fulfillment of nation-specific scientific and/or technological projects.'^{5 6} This does not mean that we are tracing a direct line of influence from a specific set of ancient narratives to modern technology. Instead, the long history of narratives about intelligent machines has a cumulative effect, and it is this transhistorical narrative influence that we are exploring here. Although the modes of storytelling have changed –

from oral to written to film and games – and the intelligent machines imagined in them nowadays tend to run on electricity rather than alchemical processes, the long history of these narratives has cumulatively shaped the hopes and expectations that led the twentieth-century AI pioneers to start building these machines.

Drawing on A2K4D's wider expertise of the MENA region, this report presents the findings from the workshop, and the broader literature review the authors have conducted on AI narratives and sociotechnical imaginaries in the Middle East and North Africa.

1.2 Defining the MENA Region

The Middle East and North Africa region is vast, and although there are cultural threads tying it together, it is also highly diverse. It is traditionally constituted by the twenty-two countries in the Arab League,⁷ although some scholars also include Turkey and Iran in their analyses of the region, as well as omitting states such as the Comoros, Somalia, and Mauritania.⁸

Countries in MENA are not perfectly homogenous in their developmental, socioeconomic, and political realities, and this in turn affects their perspectives on technological innovation.⁹ The oil-rich countries of the Gulf, like Saudi Arabia and the United Arab Emirates, are regional leaders in the adoption and deployment of AI technologies.¹⁰ With largely expatriate populations (especially in the case of the UAE), their governments adopt concerted, 'technocratic' strategies to innovation and have the financial capabilities to make large-scale investments to deploy AI across the economy – which also places them ahead of their less wealthy counterparts in the region. Mid-income countries like Egypt and Tunisia are rich in human resources, but are held back in their advancement of AI by challenging economic and

⁵ Jasanoff, S. and Kim, S-H. 2009 'Containing the Atom: Sociotechnical Imaginaries and Nuclear Power in the United States and South Korea,' *Minerva* 47 (2), p. 120.

⁶ You can learn more about imaginaries in Science and Technology Studies here: <http://sts.hks.harvard.edu/research/platforms/imaginaries/>.

⁷ They are: Algeria, Bahrain, Comoros, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, the United Arab Emirates and Yemen.

⁸ Cleveland, W., Bunton, M. 2012 *A history of the modern Middle East*, 5th edn, Colorado, Westview Press, p. xi

⁹ Rizk, N. 2020 'Artificial Intelligence and inequality in the Middle East: the political economy of inclusion', in M. Dubber, F. Pasquale and S. Das, eds., *Oxford Handbook of Ethics and Artificial Intelligence*, Oxford, Oxford University Press.

¹⁰ ElSafy, I. 2019 'UAE leads GCC in adopting Fourth Industrial Revolution', *Mubasher Info*, english.mubasher.info/news/3480654/UAE-leads-GCC-in-adopting-Fourth-industrial-revolution.

sociopolitical conditions that they have been experiencing for at least a decade. Overall, the region is characterized by the prevalence of multifaceted inequalities, a young population, and high unemployment rates among the educated youth and women.

Having said that, MENA has one of the highest percentages of women enrolling in STEM fields of study, exceeding many countries in the Global North.¹¹ In Kuwait, Qatar and the UAE, for example, women comprise 70% of university science students; these numbers are drastically lower for those who continue their work in science and research, however, as only 12% of STEM-related positions are held by women in the same countries. The same is true beyond the Gulf states. In Morocco, for example, 70% of students enrolled in STEM fields are women, but few achieve leadership positions.¹² Improvements in the access to education for women do not translate to further empowerment or wider participation in public life.¹³ The presence of women in STEM fields of study does not mean that technologies produced in the region are developed by more diverse teams. On the contrary, despite much promise and potential, there still is a strong need to address wider inequalities - related not only to gender, but also class or access to education.

The MENA region has a long and distinct cultural history, being the birthplace of the three Abrahamic religions as well as several major civilizations. The term Middle East, however, does not enjoy the same antiquity: the designation Middle East 'arose from the imperatives of late-nineteenth-century [European] strategy and diplomacy, which needed a name for the region between the "Near East," based on Turkey, and the "Far East," based on China.'¹⁴ While the term

Middle East reflects a predominantly Eurocentric view of this part of the world – a perspective this report aims to problematize – to ensure clarity, we decided to keep the expanded region of MENA as a widely accepted unit of analysis, used by international organizations such as the United Nations¹⁵ and the World Bank,¹⁶ as well as research institutions inside the region.¹⁷

The Arabic¹⁸ language is one of the key overarching commonalities throughout the Middle East and North Africa. The language reflects the key role the region has played in the history of science and mathematics, providing loanwords in English for some of the most important terminology of AI. Firstly, the ones and zeroes so crucial to computer science are, as is widely known, 'Arabic numerals.' The concept of zero, the numerals themselves, and the term 'algebra' (derived from the Arabic al-jabr¹⁹) all probably arrived in Europe through a treatise by the Persian polymath Muḥammad ibn Mūsā al-Khwārizmī (c. 750 - c. 850 CE). It is his last name that has given us the term 'algorithm.' While in the Middle Ages this term referred to the then-newly adopted system of Arabic numerals, from the late nineteenth century onwards it took on its contemporary meaning: a set of mathematical operations that together perform a particular task.²⁰

The diversity of Arabic dialects, however, is something we must bear in mind when referring to narratives in MENA, as not all Arabic material will be easily comprehensible to all speakers of Arabic. While Classical Arabic is the language of the Qur'an and classical literary works, its modernized and modified version (what linguists call Modern Standard Arabic) has become a lingua franca of the region. It is used by the pan-Arabic print media and is widely understood

¹¹ Islam, S. 2017 'Arab Women in Science, Technology, Engineering and Mathematics Fields: The Way Forward', World Journal of Education, no.7(6), p. 15.

¹² Ibid.

¹³ 'Women in Public Life: Gender, Law and Policy in the Middle East and North Africa', MENA-OECD Governance Programme, 2014, <https://www.oecd.org/mena/governance/women-in-public-life-mena-brochure.pdf>.

¹⁴ Kloppes, C. 1976 'Captain Mahan, general Gordon, and the origins of the term 'Middle East', Middle Eastern Studies, no.12, p. 1.

¹⁵ <https://www.unhcr.org/en-us/middle-east-and-north-africa.html>;
¹⁶ <https://www.ohchr.org/EN/Countries/MENARegion/Pages/MenaRegionIndex.aspx>;

<https://www.unicef.org/infobycountry/northafrica.html>.

¹⁶ <https://www.worldbank.org/en/region/mena>.

¹⁷ <https://business.aucegypt.edu/news/inclusive-development-and-fourth-industrial-revolution-mena>.

¹⁸ An important note at the outset: 'Arabic' refers to the language most commonly spoken in the region; 'Arab' refers to the culture that dominates in MENA, and that dates back to this region irrespective of today's political boundaries.

¹⁹ Al-jabr literally translates to 'the restoration' or 'the completion', a reference to the method al-Khwarizmi introduced for solving quadratic equations.

²⁰ 'Algorism, n.' n.d. In OED Online. Oxford University Press. Accessed 21 January 2021. <http://www.oed.com/view/Entry/4956#eid7070189>.

by the educated population in the region. Illiteracy of the underprivileged populations in MENA is, however, a factor we must account for when thinking about who gets to imagine AI futures in the region – as narratives often rely on Modern Standard Arabic, a primarily literary language.²¹ While literacy rates and access to higher education seem to be in a steady increase, the numbers are widely unequal for different countries in the region, and for different socio-economic groups within the given country. The entertainment industry, by contrast, often relies on verbal communication, and hence draws on local dialects and colloquial variants of Arabic; this is how TV series and popular trivia shows become easily comprehensible to a narrower audience within a given subregion or country.^{22 23} Any story produced in MENA will reflect this duality of Classical Arabic and the country-specific dialects.

The use of Classical Arabic, the language of the Qur'an, as a literary standard in MENA brings us to another element that binds the region together: the widespread prevalence of Islam. Despite multiple heterogeneous factors, including the presence of other religious groups, the concentration of Muslims per region is highest in MENA (93 percent of its 341 million inhabitants identify as followers of Islam). However, as nearly two-thirds of global Muslims live in the Asia-Pacific region,²⁴ it is important to recognize that conflating 'Arab' and 'Muslim' takes away from the understanding of the contexts and nuances of each. While this report does not focus on the

relationship between technology and Islam (see Box 1), it approaches the MENA region as an embodiment of a historical mix of civilizations with cultural origins extending beyond its current geographical boundaries into the larger Muslim world. The report aims to distill several themes predominant in regional AI narratives, common for most (but certainly not all) cultures in MENA.

What follows is an examination of six narrative threads that we have identified as pivotal to the understanding of the Middle Eastern and North African technological imaginaries and conceptions of AI futures. Section 2, 'The Technology Desert,' focuses on Western perceptions of the region and the ways in which they influence the imaginings of technological development inside MENA. Section 3, 'Arab Imaginaries,' is dedicated to the longer history of imagining intelligent machines in MENA, dating back to the Islamic Golden Age, and illustrates present-day examples in Arabic science fiction.²⁵ Section 4, 'Resistance,' analyzes contemporary efforts to create regional AI narratives as alternatives to those from the Global North. The final section examines how political and socio-economic factors shape the discourse on AI and other emerging technologies in MENA, and how local imaginings of AI relate to narrative tropes prevalent in public policy. The main text is complemented by information boxes that either provide the context for any claims made in the report or introduce mini case studies as supportive evidence.

²¹ <https://unesdoc.unesco.org/ark:/48223/pf0000146282>.

²² See: Rugh, W. A., 2004, *Arab Mass Media: Newspapers, Radio, and Television in Arab Politics*, Greenwood Publishing Group; and W. Al Allaq, 2014, 'Arabic Language in a Globalized World: Observations from the United Arab Emirates,' AWEJ <https://awej.org/images/AllIssues/Volume5/Volume5number3September/9.pdf>.

²³ The Egyptian dialect, however, remains widely understandable given the history and spread of Egypt's cinema, theatre and television series in the region.

²⁴ Desilver, D., & Masci, D. 2017 'World's Muslim population more widespread than you might think,' Pew Research Center, <https://www.pewresearch.org/fact-tank/2017/01/31/worlds-muslim-population-more-widespread-than-you-might-think/>.

²⁵ See: Renima, A., Tiliouine Richard, H., Estes, J. 2016 'The Islamic Golden Age: A Story of the Triumph of the Islamic Civilization,' in: Tiliouine H., Estes R. (eds) *The State of Social Progress of Islamic Societies*. Cham: Springer, https://doi.org/10.1007/978-3-319-24774-8_2.



Box 1. AI and Islam

Can driverless cars be Sharia-compliant?¹ This question on the potential of AI-operated vehicles to follow, or enforce, Sharia was notably the only explicit reference at our workshop to Islam and AI in the MENA context – and it remained unanswered. This lack of reference to the role of the region’s dominant religion in technological development reflects the absence of Islam in the wider discussion about AI’s implications for society and culture in MENA.

Very few scholarly articles explicitly address Islam and AI and when they do, they tend to touch on marginal aspects, abstracted from mainstream conversations or theological debates (the question of covering humanoid robots’ ‘genitalia’ is one example).² Contrary to Western expectations, this absence does not stem from a clear separation between religion and science (a particularly Western dichotomy); on the contrary, Islam places a high value on the attainment of knowledge and scientific inquiry.³ The Saudi writer Yasser Bahjatt explains that while his bestselling novel HWJN (2013) is a story about a jinn,⁴ it cannot be considered fantasy – it is science fiction because ‘we believe Islam is a scientific religion, so we try to explain the claim of existence of such beings through speculative science.’⁵

Most of the concerns and issues raised at the workshop focused on how new technologies, including AI, could exacerbate existing inequalities in the region, not their compliance with Sharia. The absence of religion as a distinct topic in our conversation counters the Western perception of Islam as a factor that must be at the forefront of any debate in MENA. In fact, the issue of Islam and AI is more often a concern for Muslims living in the West, as they are, in some sense, propelled to identify themselves through their religion, as an ‘other within.’ The ‘Islam and Science Fiction’ website⁶ is run, for example, by editors based in the US.

¹ The question refers to the so-called ‘trolley problem’ in the context of automated decision-making systems; to learn more, see: Awad, E. et al. 2018 ‘The Moral Machine experiment,’ *Nature*, <https://www.nature.com/articles/s41586-018-0637-6>.

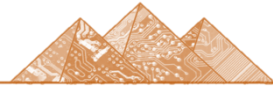
² Dahlan, H. 2018 ‘Future interaction between man and robots from Islamic perspective’, *International Journal of Islamic Thought* no. 13: p. 48.

³ Bakar, O. 2016 ‘Science and technology for mankind’s benefit: Islamic theories and practices - past, present, and future’, in M. Kamali et al. eds. *Islamic Perspectives on Science and Technology: Selected Conference Papers*, Springer Singapore, <https://www.springer.com/gp/book/9789812877772>.

⁴ In Arabic mythology, a jinn is ‘a supernatural spirit below the level of angels and devils’ (*Encyclopaedia Britannica*).

⁵ Fossett, K. 2013 ‘Can science fiction survive in Saudi Arabia?’ *Foreign Policy*, <https://foreignpolicy.com/2013/12/10/can-science-fiction-survive-in-saudi-arabia/>.

⁶ <http://www.islamscifi.com/about/>.



2. The Technology ‘Desert’

Western perceptions of success, development, progress and industrialization influence technological narratives both in the Global North and in the MENA region. Narratives of technological development in MENA, manifested in science fiction, the media-political discourse, and scholarly writing, most frequently refer directly or indirectly to Western imaginings of desirable progress. Contemporary debates on AI in MENA often appeal to or openly reject Western perspectives – but in both cases, such discourse is influenced by Western conceptions of progress.

The influence of these Western-centric visions is intimately linked to the colonial history of the region, which can be traced back to Napoleon’s expedition to Egypt in 1798. Since then, Western scholarship has depicted the history of MENA from the thirteenth to the early nineteenth century as a time of consistent decline, in contrast to the modernizing progress of Western powers. The narrative of decline in the history of MENA has been internalized by MENA populations,²⁶ and so it influences perceptions of the region both outside and inside MENA today. Self-Orientalization, the process of internalizing Western perceptions of the region by the people of MENA, came up during our workshop as one of the biggest challenges facing those who aim to voice narratives of innovation in the Middle East and North Africa that constitute an alternative to the postcolonial ones.

Western conceptions of development are reflected in the portrayals of the region as incapable of seizing and shaping the opportunities of emerging technologies such as intelligent systems. We refer to this imagery as the technology desert: a supposed lack – of resources, innovation, and ideas in the MENA region. Just as the narrative of decline shaped the

discourse on development in MENA in the past, so does the trope of the technology desert influence it in the present. While some countries in the region indeed experience a ‘brain drain’ in the technology sector (key innovation leaders migrating in search of better work opportunities – most often to Western countries),²⁷ the narratives of impossibility and absence fail to reflect the actual potential lying within the region. They affect the position of the majority of MENA countries in the global debate on the future of AI, which remain largely overlooked as actors of change on a bigger scale.

With its efforts to become a leader in technological innovation, the United Arab Emirates could be cited as an outlier, perceived by the West as a tech oasis in the desert. But this perception is largely related to the influence of Western ideals on innovation strategies in the rich countries of the Gulf, including Qatar and Kuwait (see: BOX 2: Gulf Futurism). As Western designers are hired to execute the state’s flagship innovation projects (the Museum of the Future,²⁸ for instance) and government communications clearly appeal to Anglophone audiences,²⁹ the impact of Western ideas of progress on the conceptions of technological futures in MENA becomes particularly visible.

Significant amounts of funding are administered by the UAE’s government to drive technological development – something we could contrast with resource-poor countries, such as Egypt, Tunisia or Jordan, where limited funds are available for similar initiatives. There, technological progress depends on grassroots efforts and startups and it is precisely in those countries that there is an opportunity for exploring MENA-specific conceptions of the future, as bottom-up solutions are more likely to respond to local needs and visions (something we will come back to in Section 4 of this report).

²⁶ Kirecci, M. 2007 ‘Declined discourse and self-Orientalization in the writings of Al-Tahtāwī, Tāhā Husayn and Ziya Gökalp: A comparative study of modernization in Egypt and Turkey’, PhD thesis, University of Pennsylvania, <https://repository.upenn.edu/dissertations/AAI3260932>.

²⁷ Langendorf, M. 2020. ‘Digital stability: How technology can empower future generations in the Middle East,’

https://www.ecfr.eu/publications/summary/digital_stability_how_technology_can_empower_future_generations_middle_east.

²⁸ <https://www.museumofthefuture.ae>

²⁹ For example, see: <https://www.visitdubai.com/en/business-in-dubai/why-dubai/news-and-insights/dubai-dreams-big-innovation-future>

The dominance of the Anglophone, mostly American, products on the global entertainment market is another factor that contributes to the perceived lack of local, MENA-produced stories on the future of AI, robots, and machines. AI narratives are most often exported to MENA by the West, in the form of sci-fi films and TV series such as *The Terminator*, *Star Trek*, or *Battlestar Galactica*, which dominate over locally produced, but underfunded productions. One example is the Egyptian TV series *Al Nihaya* (The End), discussed in section 3.2.

Another, perhaps equally important, influence on local AI narratives comes from Japan.³⁰ For example, multiple anime series have been featured on Arabic TV (most famously, *Grendizer* was made available via the free-to-air channel Spacetoon).³¹ Japanese AI narratives tend to be much less concerned about automation-related job loss or themes of robot

rebellion. Having been influenced by a different philosophical tradition, which emphasizes connectedness between kinds of entity (such as human, animal, machine), they ‘tend to portray intelligent machines as friends, helpers or (reliable) extensions of humans, instead of as murderous, rebellious Others.’³² This form of media globalization perpetuates the idea of the ‘desert’: the media landscape is saturated not only with Western but also Japanese narratives – leaving little room for home-grown narratives.

The imagery of the technology desert – absence of ideas, imaginaries, as well as actual tech development in MENA – is, however, only an illusion that this report aims to debunk. As we will demonstrate in the following sections, the MENA region is not a technology desert, but an underappreciated landscape replete with intellectual resources.

Box 2. Gulf Futurism



The imagery of the technology ‘desert’ is paralleled by that of the tech ‘oasis’ – embodied by the cities of the Persian Gulf, including Dubai, Abu Dhabi, or Doha. While these hypermodern municipalities in the oil-rich part of the MENA region can be seen as products of the Western imaginary of progress and development, they have also become hubs for new, Arab-focused futures thinking. In 2012, the musician Fatima Al Qadiri and writer Sophia Al-Maria coined the term ‘Gulf futurism’ to name a new aesthetic trend that arises out of the mix of the Gulf’s Blade Runner-like architecture, desert landscapes, consumerism, and suppressive social codes.¹ Al Qadiri and Al-Maria list the Kuwait Water Towers (left) as one of the most suggestive examples of Gulf Futurism. The artists identify the Gulf countries as a social and cultural experiment that gives us a glimpse into an arguably apocalyptic future, determined by harsh environmental change, deep economic divisions, and technological riches that benefit only a very small proportion of society.

¹ <https://www.dazeddigital.com/music/article/15037/1/al-qadiri-al-maria-on-gulf-futurism>

³⁰ The emphasis on the Japanese influence with respect to narrative in particular is important. That is, while China — a global leader in AI development — might have a strong impact on the geopolitical scale, there is little evidence to support the existence of an equally strong Chinese influence on AI narratives in the

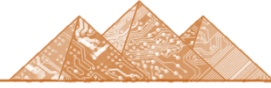
region. See, for example: <https://carnegie-mec.org/2019/09/26/how-has-china-s-role-in-middle-east-evolved-pub-79930>

³¹ <https://www.youtube.com/watch?v=YykhHRJNuqw>

³² <https://www.ainarratives.com/japan-2018>



The elephant clock in a manuscript by Al-Jazari (1206 AD) from The Book of Knowledge of Ingenious Mechanical Devices.



3. Arab Imaginaries

The narratives of intelligent machines in the MENA region are rooted in the ‘mirabilia’ tradition: ‘the travel journeys, the tales of the animal world, or the cosmos stories from the classical period,’ before the advent of Islam.³³ The Arabic term for mirabilia, ‘Ajā’ib, comes from the root for ‘to [be] astonished, to wonder, to [take] delight.’³⁴ The *1001 Nights* constitute an early collection of such stories, and have recently been reappraised as proto-science fiction.³⁵ The tale ‘The City of Brass,’ for instance, contains descriptions of automata, such as a brass horseman that is able to direct travelers to the City of Brass.³⁶ The Arabic literary tradition of imagining intelligent machines is therefore over a thousand years old.

It is not surprising that this imaginary has pervaded Arabic literature for so long, given that the MENA region excelled in building automata – self-moving machines – for more than two millennia. The city of Alexandria was a hub for engineers designing and building automata from the third century BCE onwards. Its most famous engineer was Hero of Alexandria, whose work *On Automaton-Making* from the first century CE described how to build an ingeniously moving shrine and theatre.

In the Middle Ages, the art of automaton-making flourished in the Islamic world, drawing the admiration and envy of the Latin Christian West. In eighth-century Baghdad, three brothers known as the Banu Musa, wrote their *Kitab al-Hiyal (Book of Ingenious Devices)*, which described how to build nearly a hundred automata.³⁷ Like most other cultures of the time, despite their technological mastery, the imaginative narratives featuring extrapolations of these machines were characterized

by a nostalgia for a utopia set in a golden past, rather than looking for such a utopia in the future. It was only after the Middle Ages that Western narratives began to diverge from this tradition. The colonial period was part of a major rupture in Western thinking. At this point, the West begins to identify notions of technological progress with modernity and the future. The first future utopias, driven by science and technology, emerged at this time: first with Thomas More’s *Utopia* in 1516, and in the sixteenth century with Roger Bacon’s scientifically grounded, future-oriented worldview. At the same time, the countries where this worldview emerged began to believe in their own superiority and right to dominate others as a consequence.³⁸

Subsequently, colonial conquest and imposition of this world view placed colonized regions as irredeemably lagging behind, creating an instant dichotomy between those who have reached modernity and those who remain stuck in the past unless they can become ‘modern.’ The exploitation associated with colonialism and subsequent conflict stripped colonized countries of their ability to imagine their own future. Makdisi argues,

*Modernity was, from the beginning, not only inextricably associated with Europe: it was a ‘goal’ that one could only define as a future condition, a future location, a future possibility. Modernity, in other words, is, on this account, always already displaced and deferred: it is always on the other side of the river, or up the stream – or up in the sky.*³⁹

At the same time, the associations of modernity with globalization, colonialism and exploitation have made imagining a utopian future a controversial political act in postcolonial countries. The many Western utopias that precede any attempts elsewhere in the world to imagine a technology-enabled utopia depict their

³³ Comito, C. 2013 ‘Science fiction in Arabic: “It was not born all of a sudden”’, *Arablit Quarterly*, <https://arablit.org/2013/09/30/science-fiction-in-arabic-it-was-not-born-all-of-a-sudden/>.

³⁴ Campbell, I. 2018 *Arabic Science Fiction*, *Studies in Global Science Fiction Series*, Cham: Palgrave MacMillan, p. 145-146

³⁵ Nuruddin, Y., ‘Ancient black astronauts and extraterrestrial jihads: Islamic science fiction as urban mythology’, *Socialism and Democracy*, no. 20 (3), p. 138.

³⁶ Nights 566-578: The Story of the City of Brass. *Stories from the Thousand and One Nights*. Harvard University Press, 1909-14, <https://www.bartleby.com/16/701.html>.

³⁷ Truitt, E.R. 2015 *Medieval Robots: Mechanism, Magic, Nature, and Art*. Philadelphia, PA: University of Pennsylvania Press, pp. 4, 19-21.

³⁸ Adas, M. 1989 *Machines as the Measure of Men: Science, Technology, and Ideologies of Western Dominance*. Ithaca, Cornell University Press. Available from: doi:10.7591/9780801455261.

³⁹ Makdisi, S. 1995 ‘“Postcolonial” Literature in a Neocolonial World: Modern Arabic Culture and the End of Modernity’, *boundary 2* no. 22, p. 90, <https://www.jstor.org/stable/303663>.

perfect futures as idealized extrapolations of (neo)colonialism, the utopias inhabited by homogenous white humans. Ultimately, imagining and recreating a future in a post-colonial region is not only a narrative act but a decolonial one, an attempt to disengage current chronology from its colonial and imperial roots.

3.1 Imagining the Future

Cultural artefacts can both 'write alternative histories [and] articulate counterfuturisms as imaginaries of times-to-come.'⁴⁰ Imagining a future with AI is therefore not simply a projection of a new technology onto a given location. It is also significantly linked to the past and the present, as these shape visualizations of the future as a place that contests current realities and resolves, one way or another, ongoing and past struggles. The future can be imagined through stories – novels, films, new media art – as well as material and urban realities.

As Laura Brown writes in her review of the anthology *Palestine +100*, a collection of science fiction short stories from the Palestinian diaspora:

*There is privilege when we look to the future... What idiocy to assume you can go back home after war, that tomorrow will be well?... To assume the future offers a renewed strength suggests you are in a secure present, or are confident you have the means to shift your present into a more solid future.*⁴¹

The term Arab Futurism, as Jussi Parikka rightly suggests, thus marks a link across a spectrum of contemporary political issues - related to race, territory, war, and postcolonial histories.⁴² Cultural production in the Arab world has been deeply affected by wars and political conflicts in the region, and these are echoed in the representation of characters as well as themes featured in narratives.

Speculative Data Futures,⁴³ for example, is a series of three short stories by female Arab authors presented at the workshop, which examines alternative futures using a gendered lens. In brief, one of the stories envisions a Palestine where women can navigate their urban surroundings safely through the use of a mapping application made by women for women; another story imagines the reconstruction of Syria through collecting the memories of its displaced and refugee population by means of chips implanted in them; and the third imagines the problematics of a government database collecting information on sexual harassment in Egypt, and the ethical implications of data gathering and dissemination. Indeed, all of the stories grapple with uncertain futures based on an uncertain present, augmented by a cautious view of the increased ubiquity of technology and digitization.

3.2 Arab Science Fiction

As in other parts of the world, many of the narratives about AI in the MENA region stem from literary, cinematic and other popular culture representations, particularly science fiction. The science fiction genre in its contemporary iteration emerged in the 1950s in Arabic. During the workshop, we explored how these mid-twentieth century narratives, featuring robots, cyborgs and other technologies, formed a constitutive part of the regional modernization project.⁴⁴

Scholars have both highlighted and lamented the Arabic literary tradition's focus on politics through poetry and fiction rather than other genres such as SF or fantasy.⁴⁵ While Arab science fiction (ASF) dates back decades, it has been a niche genre: 'Arab writers of SF... have been compelled, or have wished, to adopt the forms of high literature in order to be taken seriously,' a sentiment that was reiterated by Hosam El Zembely⁴⁶ at the workshop.

⁴⁰ Parikka, J. 2018 'Middle East and other futurisms: imaginary temporalities in contemporary art and visual culture', *Culture, Theory and Critique* no. 59, p. 55, <https://www.tandfonline.com/doi/abs/10.1080/14735784.2017.1410439>.

⁴¹ Brown, L. 2019 'Arab Futurism', *bidolito!* no. 101, <https://bidolito.co.uk/feature-arab-futurism-laaf-2019/>.

⁴² Parikka, 55.

⁴³ Fatafta, M., Halawi, B., Tawakkol, L. 2019 *Speculative Data Futures*, <http://menadata.net/public/project/11>.

⁴⁴ See Appendix 2.

⁴⁵ Irwin, R. 1996 'Arab Countries', in J. Sturrock ed., *Oxford Guide to Contemporary World Literature*, New York: Oxford University Press; Al-Nakib, M. 2016 'Arab literature: Politics and nothing but?' *World Literature Today* no. 90, p. 30-32.

⁴⁶ See Appendix 2.



Examples of ASF include the Egyptian TV series *Al Nihaya (The End)*,⁴⁷ set in a futuristic Middle East (in the year 2120). The series tells the story of cyborg Zain and features themes owed to the worlds of *Blade Runner*, *Terminator* and *Star Wars*. Despite heavy-handed references to these Western franchises, several unique themes appear in the series. For example, viewers learn that in Zain's time, the US becomes fragmented and in turmoil (with show writers perhaps finding inspiration in the way in which popular Western narratives often depict the Middle East). As the US falls into chaos, Arab states launch a successful liberation war for Jerusalem (where the series is set), speaking to a persistent hope in the Arab imaginary.

Similarly, speculative fiction anthologies *Iraq +100* and *Palestine +100* include contributions set a hundred years into the future of the two countries and feature technologies such as AI, androids, and virtual reality. In each chapter, authors present narratives that differ radically from the past and present of war, occupation, and exile: *Palestine +100* is set one century after the time of the Nakba, *Iraq +100* – one century after the American invasion of 2003.⁴⁸

During the workshop, Yasser Bahjatt, a Saudi entrepreneur and author of bestselling sci-fi novels (including *HWJN*) emphasized the responsibility of ASF creators to reshape the image of AI in the public eye in the Middle East, 'where our actual contribution to the advancement of this technology is even less visible and our cultural input on the matter is almost nonexistent.'⁴⁹ We will explore Bahjatt's point in more detail in Section 4, looking at the role of local AI narratives as a potential form of resistance against Western ideals of technological development.

3.3 Gendering and Anthropomorphization

The anthropomorphization of AI (giving artificial intelligence systems human characteristics) is often meant to facilitate a better interaction between the human and the machine; yet it can also perpetuate gender stereotypes.⁵⁰ In MENA, humanoid robots are often portrayed as ideal domestic servants. One example of this trend is Ruby, a robot featured in a

⁴⁷ <https://www.youtube.com/watch?v=1pS88BPMIJO>

⁴⁸ El-Mohtar, A. 2019 'Palestine + 100' Explores Contested Territory, Past And Future' NPR, <https://www.npr.org/2019/08/31/754858096/palestine-100-explores-contested-territory-past-and-future>.

⁴⁹Fossett, K. 2013 'Can science fiction survive in Saudi Arabia?' Foreign Policy, <https://foreignpolicy.com/2013/12/10/can-science-fiction-survive-in-saudi-arabia/>.

⁵⁰Costa P. & Ribas, L. 2019 'AI becomes her: Discussing gender and artificial intelligence', *Technoetic Arts: A Journal of Speculative Research*, no. 17, p. 176.

popular Egyptian comedy skit from the 1980s, in which the feminized domestic robot readily responds to orders given to 'her' by the main character - bringing to mind today's virtual assistants, such as Siri or Alexa. During the workshop, Mohamed Hamama of the media outlet Mada Masr suggested that the feminization of 'helper' robots and 'assistant' AI systems in the region is not merely a narrative trope, but also a reflection of very real inequalities between women and men in the region.

The world's first Arabic-speaking robot,⁵¹ created by Nikolaos Mavridis and his team at the Interactive Media Lab in the UAE, is an interesting example of anthropomorphization of AI in MENA. Rather than an assistant or servant, this 'male' robot is modelled on Ibn Sina (the iconic figure of the Islamic Golden Age, known in the Western world as Avicenna) and, according to Mavridis, symbolizes the region's scientific heritage, as well as aspirations for technological futures. Another local example of an anthropomorphized AI system is Zaki,⁵² a 'male' chatbot used on an Egyptian internet banking platform. While Ibn Sina represents a position of power and wisdom - attributes of masculinity in patriarchal societies - Zaki is linked to the financial sector, traditionally regarded as a male domain. Although we can find examples of gender-neutral anthropomorphic AI systems in MENA (the Cairo-based virtual assistant platform *Elves*, for instance),⁵³ the cases of Ruby, Ibn Sina and Zaki point to a larger trend, in which anthropomorphization of AI in the region proves to reinforce stereotypes about social roles assigned to genders.

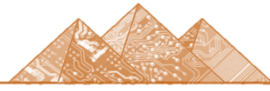
Box 3. The Egyptian Society for Science Fiction

Science fiction is still considered a niche genre in MENA. Several smaller agents have attempted to reinvigorate science fiction storytelling in MENA. The Egyptian Society for Science Fiction is one example. Founded in 2012 by Hosam El Zembely, it is considered the first registered society devoted to the genre of science fiction in Egypt. The Society's publications touch on various AI-related issues, which include automated governance, AI's revolt against humanity, or romantic relationships between humans and robots. The Society's work began without any institutional support – a fact indicative of a larger trend in MENA, where sci-fi storytellers not only have to compete with foreign, predominantly Western, creators, but also receive no systemic help. In more extreme cases, some sci-fi publications may even be withdrawn from circulation by the government on morality grounds (as was the case with Yasser Bahjatt's *HWJN*, a novel accused of promoting witchcraft and thoroughly investigated by Saudi Arabia's Committee for the Promotion of Virtue and the Prevention of Vice before it was allowed back into bookshops).

⁵¹ <http://www.dr-nikolaos-mavridis.com/ibn-sina-project.php>

⁵² <https://www.cibeg.com/English/pages/contactus.aspx>

⁵³ 'Cairo-based *Elves* raises \$2 million in seed investment from Emaar and Kauffman Fellows', *Menabytes*, 2017, <https://www.menabytes.com/elves-2-million/>.



4. Resistance

The predominant influence of Western conceptions of progress in MENA contributes to a storytelling environment driven by the need to develop an authentic regional voice through narratives about AI. Resistance against the influences of the Global North takes various shapes in the MENA region – from thriving local tech initiatives, to the rise of online communities dedicated to reimagining technological futures in the Middle East and North Africa.

There is a clear underrepresentation of the MENA region, like the rest of the Global South, across a spectrum of global debates. These include more general debates on developmental issues and, in the case of AI, debates on AI's applications, impact and necessary policy changes. If present, the region's voice is often drowned out by the more dominant perspectives from the Global North. This dominance is asserted in various ways; the global framework for intellectual property and trade, for example, leans heavily towards protecting the interests of the Global North, rather than those of the developing world.⁵⁴

New technologies, including AI-driven solutions, were discussed at the workshop as convoluted cases of cultural dumping; as most of the emerging systems are designed and developed in the Global North, they harness in them biases that do not necessarily correspond to the realities of the Global South, MENA included. Facial recognition software, for example, can prove problematic when confronted with colored skin; natural language processing algorithms imported from the West can also fail when used to process Arabic. Biases can also end up in policymaking that is detached from the local context and corresponds to a layered underrepresentation of grassroots needs.⁵⁵

Countervailing forces come in the form of a dynamic pushback from smaller local players, as they carve a niche for themselves and increasingly contribute to the local and regional narratives of progress and development, amidst the influence of larger players with more dominant voices. Especially since the 2011 uprisings (see Box 5) in countries like Egypt and Tunisia, a budding entrepreneurial scene demonstrates how local startups continue to harness the potential to innovate and tilt the balance in favor of homegrown initiatives. At the same time, large players can continue to consolidate their market share, as witnessed in the case of the ride-sharing market in Egypt, where Uber recently acquired its smaller regional counterpart, Careem. Such market concentration is countered by local startups that customize services to the realities on the ground, typically informal transport networks and needs. For example, Halan⁵⁶ is a successful ride-sharing platform launched in 2017 in Egypt, for 'tuktuks', a mode of transport similar to rickshaws. Another local start up, Swvl, was the first player to introduce on-demand bus rides via a mobile application to the Egyptian market in 2017. While larger players such as Uber have now introduced bus services as well, Swvl continues to grow locally and expand internationally into Africa.⁵⁷

Entrepreneurial initiatives serve as 'rays of hope'⁵⁸ in providing more sustainable work and creative opportunities to the educated youth – in a region with high unemployment rates among the youth and the educated.⁵⁹ This means that the regional perception of the future of work, like elsewhere, reflects a concern with robots potentially replacing humans. The media also focuses on the need for education and training to mitigate these challenges.⁶⁰ One report cites that 45% of jobs in the Middle East can be automated 'now' while a similar portion of jobs across

⁵⁴ Rizk, N. & Shaver, L. (eds.) 2010 *Access to Knowledge in Egypt*, New Research in Intellectual Property, Innovation and Development, London: Bloomsbury.

⁵⁵ A discussion of how big data and machine learning algorithms can reflect already existing biases – and aggravate their impact on underprivileged people's lives – can be found in Rizk, N. 2020 'Artificial Intelligence and inequality in the Middle East: the political economy of inclusion', in Dubber, M., Pasquale, F. and Das S. (eds.), *Oxford Handbook of Ethics and Artificial Intelligence*, Oxford, Oxford University Press.

⁵⁶ Nabil, Y. 2019 'In conversation with Mounir Nakhla of Egypt's Halan', *Wamda*, <https://www.wamda.com/2019/01/conversation-mounir-nakhla-halan>.

⁵⁷ Farouk, E. & Saba, Y. 2019 'Egyptian transport start-up Swvl targets expansion in Africa, Asia', *Reuters*, <https://www.reuters.com/article/us-egypt-economy-swvl/egyptian-transport-start-up-swvl-targets-expansion-in-africa-asia-idUSKBN1W10DQ>.

⁵⁸ Rizk, N. 2020 'Artificial Intelligence and inequality in the Middle East: the political economy of inclusion', in Dubber, M., Pasquale, F. and Das S. (eds.), *Oxford Handbook of Ethics and Artificial Intelligence*, Oxford, Oxford University Press.

⁵⁹ *Ibid.*

⁶⁰ Moore, J., Chandran, V. & Schubert, J. 2018 *The Future of Jobs in the Middle East*, World Government Summit & McKinsey & Company; Al Gurg, T. 2019 'Education can secure the future of work in MENA region and beyond', *Gulf News*, <https://gulfnews.com/opinion/op-eds/education-can-secure-the-future-of-work-in-mena-region-and-beyond-1.66434742>.

sectors such as manufacturing and transport have the potential for future automation (both through robotics and AI).⁶¹ Others, including state-run newspapers in Egypt, contribute to a more positive view, focusing on the potential for new jobs in the 'green economy.'⁶² Governments across the region have prioritized training, re-skilling and providing high quality education, especially in IT and data literacy, across all sectors of employment. This mirrors the narrative promoted by the media; in the UAE, for example, the government's strategy for artificial intelligence, and other national initiatives such as the 'Advanced Skills Strategy,'⁶³ outline frameworks and action plans that are already in place to equip citizens with necessary skills for the future of work.

Other ground-up initiatives and grassroots citizen activities also play a significant role in voicing the regional imaginary of technological futures. Sci-fi-oriented online communities in particular offer a

platform for exploring local AI narratives. One example is Yatakhayaloon,⁶⁴ an Arabic science fiction group that brings together both fans and creators. Another, the Arabic E-Lit (electronic literature) website,⁶⁵ is an online platform intended for Arabic-speaking practitioners of multimedia storytelling, whose mission is to move 'beyond the hegemony of the English language of Anglo-American cultural concerns' and 'declare a global and inclusive electronic literature, driven by the energy of Arabic E-Lit.' The website's creator, Reham Hosny, has recently published the first Arabic augmented reality/hologram novel titled *Al-Barrah (The Announcer)*. This shows that more creators in MENA are successfully appropriating emerging technologies, including AR/VR and AI, in their practice to counter dominant Western and postcolonial narratives.

Box 4. Defying the neocolonial gaze

Assia Boundaoui is an Algerian-American journalist and filmmaker, whose AI-driven INVERSE SURVEILLANCE PROJECT aims to re-claim narratives about her community of Arab Muslims living in the US. The project combines machine learning and oral testimonies of those from the community who have been interrogated by the FBI – to reconstruct the content redacted from retrieved interrogation reports. While the project focuses on Arab Muslims living in the diaspora, the artist demonstrates how new technologies can be used to revert the racist gaze and defy the dominant, postcolonial narratives perpetuated by many AI systems (most often developed by teams composed of Western, English-speaking, white men). The INVERSE SURVEILLANCE PROJECT also embodies a citizen's initiative to countervail surveillance. During the Arab Spring (see Box 5), there were multiple attempts to resist new forms of internet surveillance, but the clampdown on freedoms has since intensified and voices of resistance within the region now face harsher restrictions: carrying a similar project out in Egypt would most likely not be possible.

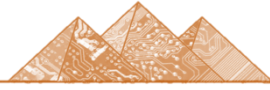
⁶¹ Moore, J., Chandran, V. & Schubert, J. 2018

⁶² El-Hawary, D. 2020. 'MENA jobs: Gearing up for the future', Ahram Online, <http://english.ahram.org.eg/NewsContent/50/1202/360018/AlAhram-Weekly/Economy/MENA-jobs-Gearing-up-for-the-future.aspx>.

⁶³ 'Advanced Skills Strategy', Official Portal of the UAE Government, January 27, 2020, <https://government.ae/en/about-the-uae/strategies-initiatives-and-awards/federal-governments-strategies-and-plans/advanced-skills-strategy>.

⁶⁴ http://yatakhayaloon.com/EN/HWJN_English.html

⁶⁵ <https://arabicelit.wordpress.com/manifesto/>



5. Uprisings and Trickle-downs

Levels of technological advancement and adoption in MENA vary considerably. Variations in turn reflect differences in socioeconomic and developmental realities and trigger a set of inherent drivers that shape the local, intra-regional and region-wide narratives. One such driver is the tension between two opposing forces that, by and large, shape any digital economy: dominant powers versus grounds-up initiatives. On the one hand, digital technologies (AI included) can perpetuate hierarchies and reinforce existing dominant powers on both the economic and political fronts. This becomes clear in an increased concentration of markets, technology infrastructure and data ownership in the hands of large multinational corporations, and expanded state control. In Egypt, for example, disputes around data retention and access for purposes of national security in the case of ride sharing, highlights the direction and intention for further concentration.⁶⁶ These forces moving towards the center are countervailed by opposing currents whereby small businesses and grassroots citizenry are emboldened using the very same technologies.⁶⁷ These opposing streams occur simultaneously, and while global in nature, tensions become more pronounced in the region in light of weaker institutions and nascent legislative frameworks.

These tensions also imply another layer of complexity with implications for AI narratives and visions of technology futures in the region. A dominant voice will be that of large corporations actively seeking further consolidation and concentration, propagating narratives largely similar to those of other multinational corporations around the world.

Governments chime along echoing neoliberal philosophies and Western perspectives. Nevertheless, the visions of technology futures will also be shaped by organic grounds up initiatives who are knee deep in local context and find their competitive edge and niche in customizing foreign technologies and developing local ones to suit realities on the ground.

Historically, modernization was not always synonymous with the West. Aspiring to 'modernize' Egypt in the 1960s, then President Nasser turned East to receive support from the Soviet Union, notably to finance the Aswan Dam, in addition to military support.⁶⁸ Other regional leaders at the time, including those of Syria and Iraq followed suit. The Soviet Union thus became a primary source of weapons, technological innovation and a model for modernization. Space exploration was one of the goals that the Nasserist regime aspired to. This was echoed in popular culture and cinema. For example, Nasser's aspirations to build an Egyptian space agency correlated with the productions of films such as *A Trip to the Moon* (1959) and a feature on Egypt's space exploration in the 1965 issue of *Al Mossawir* magazine.⁶⁹

The shift to the West came with the introduction of the Open-Door Policy by Egypt's president Anwar Sadat following the 1973 October War, as Egypt turned to the United States in terms of aspirations of modernization and economic growth.⁷⁰ Washington based International Financial Institutions (IFIs) prescribed and propagated neoliberal policies to the region's developmental and technological ailments via the Economic Reform and Structural Adjustment Program (ERSAP).⁷¹ This was accompanied by the introduction of the Internet in the 1990s and building a strong telecommunication network to provide the backbone of the ambitious economic growth model.⁷²

⁶⁶ 'TIMEP Brief: Uber and Careem law', Tahrir Institute for Middle East Policy, December 2, 2019, <https://timep.org/reports-briefings/timep-brief-uber-and-careem-law/>.

⁶⁷ Rizk, N. & Elkassas, S. 2010 'The software Industry in Egypt: What role for open source?', in Rizk, N. & Shaver L. (eds.), *Access to Knowledge in Egypt: New Research on Intellectual Property, Innovation and Development*, London: Bloomsbury, p. 138.

⁶⁸ Cleveland & Bunton, op. cit., p. 315.

⁶⁹ This theme was explored by Iman Hamam in her presentation: See Appendix 1.

⁷⁰ Aulas, M. 1982 'Sadat's Egypt: A balance sheet', *Middle East Report* 107, <https://merip.org/1982/07/sadats-egypt-a-balance-sheet/>.

⁷¹ Amin, G. 1995 *Egypt's economic predicament: A study in the interaction of external pressure, political folly and social tension in Egypt, 1960 - 1990*, Leiden: Brill; Bein, J. 2009 'Neo-liberal structural adjustment, political demobilization, and neo-authoritarianism in Egypt', in Guazzone, L. & Pioppi, D. (eds.), *The Arab state and neo-liberal globalization: The restructuring of state power in the Middle East*, Reading: Ithaca Press.

⁷² Rizk, N. 2016. 'Media Concentration in Egypt,' *Who Owns the World Media? Media Concentration and Ownership Around the World*, Noam, E (ed.), New York: Oxford University Press.



The dominant narrative was of information and communication technology (ICT) as a driver for economic growth. This resulted in top-down ‘one size fits all’ policies, geared towards heavy investment in the ICT infrastructure in countries like Egypt. Such policies were fixated on economic gains and the interests of large, often foreign, corporations. and legal frameworks in their favor. This meant an impending ‘threat of de-contextualization and technological determinism’⁷³ and resulted in few direct efforts to customize policies to local needs and mitigate inequalities.

The Arab Uprisings, which took off in Tunisia and Egypt in 2011, stand as testament to the limitations of trickle-down economics and policies fixated on economic growth fueled by foreign direct investment and multinational corporations at the expense of inclusive and sustainable development. Indeed, the mainstream discourse was a top-down narrative that

boasted high rates of economic growth (reaching 7 percent in 2007-2008),⁷⁴ and, in reality, failed to capture the discontent that was brewing on the ground – and eventually led to the Uprisings.

Currently present in the regional media discourse, is a notion that the Fourth Industrial Revolution,⁷⁵ a term that refers to a new wave of technological changes causing unprecedented and pervasive changes to all aspects of human life, is already in motion, and that the citizens and governments need to work towards reaping its gains and mitigating its ills. The news coverage of the future of work serves as a good example. This ranges from a positive and proactive outlook to a more negative one. Positive coverage focuses on technological development, improved efficiency and productivity and government efforts to create new work opportunities and mitigate any shortcomings.⁷⁶ Other pieces reflect a concern with robots replacing professionals in the region.⁷⁷

⁷³ Rizk, N. 2020 ‘Artificial Intelligence and inequality in the Middle East: the political economy of inclusion’, op. cit.

⁷⁴ Gordon, M. 2018 ‘Forecasting instability: The case of the Arab Spring and the limitations of socioeconomic data’, Wilson Center, <https://www.wilsoncenter.org/article/forecasting-instability-the-case-the-arab-spring-and-the-limitations-socioeconomic-data>.

⁷⁵ The term was coined by Klaus Schwab, Founder and Executive Chairman of the World Economic Forum in 2016: <https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond>

⁷⁶ See: <https://www.emirates247.com/news/emirates/dubai-future-academy-prepares-uae-s-workforce-for-fourth-industrial-revolution-2020-02-24-1.692694>; <https://www.khaleejtimes.com/technology/why-the-fourth-industrial-revolution-will-create-plenty-of-opportunities>; <https://www.egypttoday.com/Article/3/78635/Is-Egypt-ready-for-the-4th-Industrial-Revolution>.

⁷⁷ See https://www.zawya.com/mena/en/business/story/Rise_of_robots_Most_UAE_residents_fear_they_will_be_out_of_work_in_ten_years-ZAWYA20200130051846/.

Today, it remains to be seen whether similar trends will be witnessed in the ambitious developments and AI strategies across the region, including Egypt's Vision 2030,⁷⁸ Saudi Vision 2030,⁷⁹ UAE Vision 2021⁸⁰ and 2030, Jordan National Vision⁸¹ and Strategy 2025, to name a few – as well as various national AI strategies. While such plans ultimately strive to meet the United Nations Sustainable Development Goals, the impact of such policies on inclusion is yet to be tested. This is also the case when we consider AI-based technology solutions, developed in the West without accounting for contextual differences – poverty of the population in particular.⁸² This is pertinent to inequality in the region, which can be reproduced by AI as highlighted by several speakers at the workshop. For example, anthropologist Yasmine Moataz noted how issues related to labor and AI development particularly affect those who are 'intersectionally disadvantaged and multiply burdened under capitalism,' citing the deployment of autonomous taxi vehicles in Dubai and the accompanying threat they pose to immigrant drivers in the city. Yet this assault, exemplified here by the immigrant taxi drivers in Dubai, is only one dimension of the global economy today under neoliberalism, with other features taking the form of diminishing public space (to make way for mega real estate projects), as well as increasingly widespread political repression and policing, two of the many issues which could be exacerbated through a hastened deployment of AI technologies. In Tabuk, for example, Abdurraheem al-Huwaiti was killed after protesting the eviction of his tribe from its historic homeland,⁸³ part of the area allocated by authorities for the



Protesters in Tahrir Square, 2011 (photo: Nagla Rizk).

development of the futuristic, AI-powered city of NEOM.⁸⁴ At the Qalandia checkpoint in occupied Palestine, Israeli forces deploy increasingly invasive surveillance technologies, including facial recognition, to monitor Palestinian crossers.⁸⁵ One panelist argued that, when contrasted against this particular context of profit-driven economies and state surveillance characteristic of the neoliberal turn in MENA, the notion of choice to use AI for good, emphasized by AI experts and narratives emerging from the West, is undermined.

⁷⁸ 'Egypt's Vision 2030', Arab Republic of Egypt: Cabinet of Ministers, 2020, <http://www.cabinet.gov.eg/English/GovernmentStrategy/Pages/Egypt%E2%80%99sVision2030.asp>.

⁷⁹ 'Kingdom of Saudi Arabia Vision 2030', Saudi Vision 2030, 2020, vision2030.gov.sa/en.

⁸⁰ 'UAE Future 2021-2030', Official Portal of the UAE Government, 2019, government.ae/en/more/uae-future/2021-2030.

⁸¹ 'Jordan 2025: A National Vision and Strategy', Jordan Development Knowledge Management Portal, 2020, jordankmportal.com/resources/jordan-2025-a-national-vision-and-strategy.

⁸² Rizk, N. 2020 'Artificial Intelligence and inequality in the Middle East: the political economy of inclusion', op. cit.

⁸³ Gardner, F. 2020 'Saudi tribe challenges crown prince's plans for tech city', BBC, <https://www.bbc.com/news/world-middle-east-52375343>.

⁸⁴ Allen, D. 2020 'Neom: An AI metropolis in the desert', MedicalExpo, <http://emag.medicaexpo.com/neom-an-ai-metropolis-in-the-desert/>.

⁸⁵ Hellmann, M. 2020 'A tale of two AI cities: Inside the Seattle connection to Israel's surveillance network', Seattle Times, <https://www.seattletimes.com/business/technology/washington-state-tech-giants-share-strong-links-with-israeli-ai-startups-fueling-global-surveillance-networks-but-also-raising-ethical-concerns/>.

Box 5. The Arab Spring

The 2011 uprisings, beginning in Tunisia and culminating in what later came to be known in the global media discourse as the Arab Spring, are often celebrated and remembered as leaderless and digitally mediated, made possible through a loose group of active Internet users. Yet, the role of communication technologies in the Arab Spring is best understood as one of a multitude of factors at play with local nuances unique to each country's upheavals.

In Egypt, mounting discontent with multifaceted inequalities on the ground was coupled with a growth of, at least in the early days, 'unregulated debate'¹ in online spaces. Most of the users involved in Egypt were veteran bloggers and already active in on-the-ground political struggles since the start of the 2000s. They thus shared largely aligned views, and took to the online sphere to discuss, deliberate and disseminate their discontent. With the introduction and skyrocketing popularity of platforms such as Facebook (and to a lesser extent, Twitter) in 2006 and 2008, respectively, the online sphere grew and transformed from a mostly coherent community to reflect a much wider cross section of Egyptian society: internet had ceased to exist as a confined space for activists. 'The ground came online'² was an expression and sentiment echoed by various veteran online users whose presence predated 2011.

This instrumentalization of the Internet as a tool for radical political activism was itself an unintended, unforeseen, and undesired consequence of the State's introduction of the technology in the late 1990s, which had, originally, chosen to adopt and market the Internet as part of its growth-oriented agenda. However, unlike Egypt, online spaces in Tunisia were strongly regulated from the onset. Nevertheless, Tunisian bloggers continued to voice dissent online and the online community was able to successfully harness online tools for civic engagement and mobilization.³ Indeed, increased internet penetration on the back of economic reform in the early 2000s together with online efforts by veteran Tunisian bloggers in the decade preceding the uprisings is thought to have helped create 'a national collective identity' across Tunisian society. This is considered to have played an important role in the success of 2010 mobilizations.⁴

Interestingly, and perhaps as part of a certain newfound alertness of the Internet as a threatening political tool, debates within the online sphere today have become more and more reflective of the current political state in Egypt and of power structures now in place, with regime supporters, traditional media and state institutions coming online.



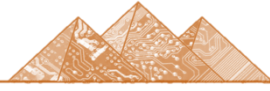
While both top-down and (due to reactionary backlash, to a lesser extent) ground-up forces are concurrently at play using online channels, there is an irony to be appreciated in how the instruments originally intended to serve as the backbone for economic growth (to mostly come from exclusive large businesses) resulted in more inclusivity, providing the main channel through which the Arab Spring eventually erupted.

¹ Rizk, N., Attalah, L. & Weheba, N. 2016 'The Networked Public Sphere and Civic Engagement in Post-2011 Egypt: A Local Perspective', *Arab Networked Public Sphere*, <http://www.arabnps.org/egypt/>.

² Ibid.

³ Nagazi, E., Halioui, J. & Mabrouk, F. 2016 'An Accelerated Story of the Emergence and Transformation of the Networked Public Sphere: The Case of Tunisia', *Arab Networked Public Sphere*, <http://www.arabnps.org/tunisia/>.

⁴ Breuer, A. 2012 *German Development Institute Discussion Paper No. 10/2012*, Deutsches Institut für Entwicklungspolitik (DIE), p. 4.



6. Conclusions and Next Steps

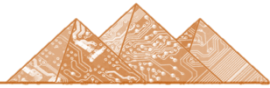
The influence of narratives on the future of AI and other emerging technologies is significant in MENA. When compared with the Anglophone world, however, this influence is less explicit in MENA, and uncovering it requires a nuanced approach, which takes into consideration not only directly expressed stories, but also more elusive imaginaries – embodied by the local startup ecosystem or online communities of futurists, for example. Understanding the soft power of technology as a means of expression, especially as it intersects with voices of resistance, is critical to appreciating AI imaginaries in MENA.

While it is impossible to approach the history and culture of the Arab world without taking Islam into account, we have seen that religious discourse does not directly feature in the wider discussion about AI's implications for society and culture in MENA. The region constitutes a unique storytelling environment, defined by a complicated past, as well as contemporary economic and political struggles. While the history of imagining intelligent machines in MENA dates back to the Islamic Golden Age, Western perceptions of success, development, progress and industrialization influence the hopes and dreams for the future of technology in the region. This is why it is essential to look for the expression of local hopes for technological futures in bottom-up initiatives (societies, art projects, start-ups), rather than top-down, government-orchestrated efforts to drive innovation, as they often respond to Western conceptions of progress.

The regional perspectives on the future of technology and automation are linked to existing questions on multifaceted inequalities in the region; the matters of class, access to education, and literacy are especially relevant to any discussion on AI in the MENA context, as AI-based technology solutions that fail to account for contextual differences could only exacerbate these inequalities. The question of inequality and AI in the region also relates to gender; the popular

perception of robots as supplanting the necessarily female domestic helper in the future, for example, raises further questions on the adoption of AI technologies in relation to gender stereotypes in MENA.

This report is a product of collaboration between authors who represent diverse disciplinary backgrounds, as well as perspectives from outside and inside the region. It directly follows a workshop on AI narratives in MENA, which involved artists, technologists, academics and journalists. During the workshop, we discussed the role online communities can play in the region – by enabling and encouraging collaboration and transdisciplinary work on imagining a future with intelligent machines in MENA – as well as outside of it – by introducing the Middle Eastern and North African perspective on AI and other emerging technologies to a wider, international audience. Setting up a digital repository of AI narratives from MENA, a website that could be a starting point for such an online community, as well as promoting this report at conferences and among communities that often overlook the Middle Eastern and North African perspectives on AI, are among our key action points.



7. About the authors

Stephen Cave is Executive Director of the Leverhulme Centre for the Future of Intelligence and Senior Research Associate in Philosophy at the University of Cambridge. Previously, Stephen earned a PhD in philosophy from Cambridge, then spent a decade in the British Foreign Office, where he served as a policy advisor and diplomat. He is author of the book *Immortality* (Penguin Random House), a *New Scientist* book of the year, and co-editor of *AI Narratives: A History of Imaginative Thinking About Intelligent Machines* (OUP, 2020). His research interests currently focus on the nature, portrayal and governance of AI.

Kanta Dihal is a Senior Research Fellow at the Leverhulme Centre for the Future of Intelligence, University of Cambridge. Her work intersects the fields of science communication, literature and science, and science fiction. She leads two research projects, *Global AI Narratives* and *Decolonizing AI*, in which she focuses on the portrayals and perceptions of artificial intelligence across cultures. She is co-editor of *AI Narratives: A History of Imaginative Thinking About Intelligent Machines* (OUP, 2020) and has advised the World Economic Forum, the UK House of Lords, and the United Nations on portrayals and perceptions of AI. She obtained her DPhil on the communication of quantum physics at Oxford in 2018.

Tomasz Hollanek is a media and technology researcher at the University of Cambridge, working at the intersection of media theory, philosophy of technology and design studies. His PhD research focuses on design and critique in the age of artificial intelligence. He is a Student Fellow at the Leverhulme Centre for the Future of Intelligence and a Network Member of the Trust and Technology Initiative at Cambridge, and has worked as a research assistant on the *Global AI Narratives* Project (Leverhulme CFI, Cambridge) and the *Computational Propaganda Project* (Oxford Internet Institute).

Nagla Rizk is Professor of Economics and Founding Director of the Access to Knowledge for Development Center (A2K4D) at the American University in Cairo's School of Business. Her research area is the economics of knowledge, technology and innovation with emphasis on human development in the digital economy in the Middle East and Africa. Her recent work focuses on the economics of data, AI and inclusion. She authored the chapter on "Artificial Intelligence and Inequality in the Middle East" in *The Oxford Handbook of Ethics of Artificial Intelligence* (Markus Dubber et al., eds., Oxford University Press, forthcoming 2020). She leads the Open Data for Development Node for the Middle East and North Africa and is a member of the Steering Committee of the Open African Innovation Research Partnership. She is also a member of the World Economic Forum's Global Future Council on the New Economic Agenda and of the Executive Committee of the International Economic Association. She is Faculty Associate at Harvard's Berkman Klein Center for Internet and Society, Affiliated Faculty at Harvard Law School's Copyright course, Affiliated Fellow of Yale Law School's Information Society Project and Associate Member of the University of Ottawa's Centre for Law, Technology and Society. She has a record of advocacy and policy impact in the area of open source technologies, the right to information and alternative innovation assessment in Egypt.

Nadine Weheba's research interests are the political economy of Information communication technologies, innovation and development. As part of the Open African Innovation Research Project, of which A2K4D at the American University in Cairo is the North African Hub, she is engaged in research on knowledge governance, openness, collaboration and alternative metrics for innovation in Africa. Nadine also studies artificial intelligence and inclusion in the context of Egypt, Africa and the Middle East region. She received her MSc in development studies from the School of Oriental and African Studies (SOAS) at the University of London in 2013 and holds a BA in economics from The American University in Cairo.

Appendix 1: Workshop participants

PANEL 1. AI Narratives: Views from the West. Moderator: Dr Nagla Rizk

Panelists:

Tomasz Hollanek, CFI, University of Cambridge
Dr Stephen Cave, CFI, University of Cambridge
Dr Kanta Dihal, CFI, University of Cambridge

PANEL 2. AI and Popular Culture: Contemporary Perceptions in North Africa and the Middle East. Moderator: Dr Kanta Dihal

Panelists:

Dr Nikolaos Mavridis, Interactive Robotics and Media Lab, United Arab Emirates
Dr Iman Hamam, Department of Rhetoric and Composition, American University in Cairo
Dr Reham Hosny, University of Leeds and University of Minia, Egypt
Yasser Bahjatt, Yatakhayaloon: Arab League of Sci-Fiers, Kingdom of Saudi Arabia

PANEL 3. Intersectionality and AI in the Arab World. Moderator: Tonii Leach

Panelists:

Assia Boundaoui, Director of 'The Feeling of Being Watched'
Dr Yasmine Moataz, Department of Anthropology, American University in Cairo
Farah Ghazal, Access to Knowledge for Development Centre, the School of Business, American University in Cairo
Mohamed Hamama, Mada Masr Media, Egypt

PANEL 4. Is there an Arab Futurism? Conceptualizations and Future Studies of AI in the Region. Moderator: Hana Shaltout

Panelists:

Dr Imad Elhadj, American University in Beirut
Dr Hosam el Zembely, The Egyptian Society for Science Fiction
Dr Muhammad Ahmad, University of Washington; Islam and Science Fiction Website
Aya El Sharkawy, Access to Knowledge for Development Centre, the School of Business, American University in Cairo

PUBLIC PANEL. AI NARRATIVES. Moderator: Hana Shaltout, Access to Knowledge for Development Center, School of Business, The American University in Cairo (Egypt)

Panelists:

Stephen Cave, Leverhulme Centre for the Future of Intelligence, University of Cambridge
Assia Boundaoui, Director of 'The Feeling of Being Watched' (Algeria/United States)
Hosam El Zembely, The Egyptian Society for Science Fiction (Egypt)
Yasser Bahjatt, Yatakhayaloon: The League of Arab Sci-Fiers, (Saudi Arabia)

Appendix 2: Workshop presentation abstracts

PANEL 1. AI Narratives: Views from the West.

1. Tomasz Hollanek: What is Artificial? The mechanism of metaphorical abstraction simplifies reality to arrive at an easily digestible, pre-packed idea of an object, one that misrepresents the object's essence and overlooks its true composition, but also satiates the end user's curiosity. Our experience of new technologies is often shaped by marketing, rather than engineering – the technological trick depends on successful storytelling, not mere craftsmanship. In this talk, I refer to the long history of artificiality as a concept in the West to demonstrate how, until today, it influences the perception of emerging technologies in the Anglophone world through the very term 'Artificial Intelligence.'

2. Stephen Cave: Intelligence as Ideology. The concept of intelligence has always been political, in the sense of used to establish and enforce systems of power and privilege. This talk will briefly sketch the outlines of intelligence as ideology, then ask what this legacy means in the age of intelligent machines, arguing that it is distorting the current debate about the ethics and impact of AI. In particular, it will examine the focus on automation and middle-class jobs, the cult of brilliance in the technology sector, and the fear of artificial super-intelligence.

3. Kanta Dihal: Hopes and Fears for AI in the English-Speaking World. Artificial intelligence is a technology with a rich and impactful narrative history. These narratives, more so than the current state of the technology, shape public perceptions, which in turn can significantly impact the future applications of AI. In this talk, I will present a categorisation of eight fundamental hopes and fears expressed in imaginings of AI. These are mediated by the notion of control: the utopian vision turns into a dystopian one when people no longer feel in charge of their intelligent machines. These perceptions of AI's possibilities, which may be quite detached from the reality of the technology, can influence how it is developed, deployed and regulated. In a survey of the UK public, the most common visions of the impact of AI, even some of the utopian ones, elicit significant anxiety; moreover, many expressed anthropomorphic associations with the idea of artificial intelligence.

PANEL 2: AI and Popular Culture: Contemporary Perceptions.

1. **Dr Nikolaos Mavridis: Artificial Intelligence in the United Arab Emirates.** The landscape regarding awareness as well as opinions and availability of Robots and Artificial Intelligence in the United Arab Emirates, as well as the wider region, has drastically changed: what in the first decade of 2000 was just a remote curiosity that few people would have ever experienced, and certainly could not imagine being developed and even existing widely in the gulf, has now started to enter everyday reality, and is certainly also an important part of government and business narratives. However, regional and cultural effects can play a noteworthy role on attitudes regarding such technologies, as well as on their development, deployment, and acceptance. In this talk we will briefly touch upon the history of the Interactive Robots and Media Lab (IRML) in the region, as well as on published studies regarding opinions and attitudes on humanoid robots in the region, and also on a wider range of activities and initiatives on such technologies, including those targeting socially beneficial domains. A number of interesting peculiarities, difficulties, as well as successes and opportunities will be briefly touched upon.

2. **Yasser Bahjatt: Sci-Fi in the Middle East: AI and Its Public Perception.** When we say AI, most people think of robots, as our imagination is shaped by sci-fi. From movies such as Terminator to the Borg in Star Trek or the Cylons in Battlestar Galactica. This view limits our thinking and hinders our ability to properly benefit from the current and future advancements in AI. This puts a lot of responsibility on sci-fi authors to reshape the image of AI in the public eye, and that is even more true in the Middle East – where our actual contributions to the advancement of this technology is even less visible and our cultural input on the matter is almost nonexistent.

3. **Iman Hamam: Images and imaginations of robots, cyborgs and automata.** Marked in the 1950s by news broadcasts of launching satellites, rockets, and space stations, science fiction has been noted as a (re)emerging genre in contemporary Arabic writing and film. I will begin by looking at the various experimental films, documentaries and comics that have been categorized as science fiction in order to draw attention to how genre has been adopted by Arab artists and filmmakers. I will trace images and imaginations of robots, cyborgs and automata in live action film, animation, literature and culture more broadly, with a view to discerning the different ways that machinery and technology -- as part of the modernization project of the twentieth century and the military industrial complex that has extended into the twenty-first century -- have contributed to the formation of the Arab body as post-colonial citizen/subject.

4. **Reham Hosny: AI as a Narrative Technique: Perspectives on the First Arabic AR and Hologram Novel Al-Barrah.** This presentation focuses on discussing how artificial intelligence was used as a narrative technique in the first Arabic augmented reality and hologram novel Al-Barrah [The Announcer], created by Reham Hosny and Mohamed Nasef. This presentation starts with introducing Al-Barrah as the first novel to combine augmented reality and hologram technologies with Arabic linguistic text inside the borders of a paper book to provide the reader with a unique and immersive experience. Then, the nature and ways of employing the augmented reality technology in Al-Barrah will be clarified with practical examples from Al-Barrah. After that, the presentation proceeds to show the role of hologram technology in developing narration in Al-Barrah and immersing the reader in the novel's world with

PANEL 3. INTERSECTIONALITY AND AI.

1. **Assia Boundaoui: THE INVERSE SURVEILLANCE PROJECT.** This presentation will explore my work on THE INVERSE SURVEILLANCE PROJECT using machine learning to disrupt and re-claim narratives about myself and my community as an Arab Muslim woman living in the diaspora. How do the intersectional identities of gender, race and ethnicity play out in our work as artist practitioners in the largely white and male domain of Artificial Intelligence? How might these intersections - our positionally in the margins, our "in-betweenness" - contribute to new interventions in the field? How might the restrictions of access to "big-data" create new spaces for artistic exploration?

2. **Yasmine Moataz Ahmed: AI in the Arab World: discrimination, transparency and accountability.** The rapid rise of artificial intelligence technology in the Arab world had generated new questions about the relationship between people and machines in a context that is facing challenges at the economic, political, moral and social levels. In this brief intervention, I would like to raise the following points for discussion. 1) How does our experience and work as anthropologists working in and on the Arab world inform our perspective of artificial intelligence? 2) What is the political agenda that lies behind AI in the Arab context? In other words, what kind of pressing questions around discrimination, transparency and accountability, as well as privacy and safety of those who are using these rapidly emerging AI technologies shall we ask? This is an ever-pressing question given that the primary agora of political debate, participation, and activism is now social media. And

3. **Farah Ghazal: Situating AI in the Global South.** Until fairly recently, much of the dominant literature on Artificial Intelligence (AI), originating mainly from the West and exported elsewhere, has maintained a recurrent discursive theme of optimism and linear development. It envisions a future in which AI technologies permeate and enhance all aspects of life. It constantly points to the ways in which the power of AI is something "we" in the Global South can harness for good, or for bad. I attempt in this paper to humbly contribute to a growing body of critical technology studies by veering away from the presumptive dichotomy and asking a few prerequisite questions which I believe are necessary for a serious consideration of what AI means for the Global South. In the Global South, what kind of subject has the power to create, distribute, and harness AI? What is the political and economic backdrop against which this harnessing takes place? What future are we helping shape in the Global South (and for whom) when we engage uncritically with AI progress narratives? I try to answer these with the help of a few key concepts in critical theory, such as Weberian disenchantment and intersectionality as theorized by Kimberlé Crenshaw. It is my suggestion that by situating AI in a material, socioeconomic and political context it becomes possible to accomplish the necessary task of furthering an understanding of AI which is mindful of the implications it carries for the Global South.

4. **Mohamed Hamama: AI in Arabic/Egyptian media.** The main point of my talk is about the discourse around AI in Arabic/Egyptian media and what it tells us about our position in the world. I will attempt to explore the gap between the technological realities of AI versus the fantasies of the imaginative mind that shape our current collective understanding of utopia/dystopia and the shadows this casts on how we tackle modern issues like

labor. In the past few years, there was an AI boom in the region. For example, the Egyptian government launched what it called the “National strategy for AI”. The meaning of this is unclear; and I argue that it’s not clear to the government itself as much as it’s not clear to us. Our current discourse around AI is affected partly by the international discourse that simplifies AI into a “much more capable” version of us - humans- and thus jeopardizing our domination of our lives and the planet. But, along with this, our local discourse is affected by our (almost) complete absence from the process of actually developing what we agreed to call AI. The main problem with this in my opinion is that it forces people from this region into the international domain of AI but without the literature of resistance and emancipation that is/ should be developed with it. The result is that it inherited the already existing social constructs: gender, race and class.

PANEL 4. IS THERE AN ARAB FUTURISM?

1. Imad H. Elhajj: Impact of the Fourth Industrial Revolution on Development in the Arab region. The impact of the fourth industrial revolution is already being witnessed throughout the world. This economic, cultural, and social impact bring along several opportunities related to inclusive economic growth, empowerment of women, and sustainable and responsible development. However, there are also risks related to the job market, security, privacy, and the several ethical questions that this technological revolution brings. In this talk we will present some of the outcomes of our report "Impact of the Fourth Industrial Revolution on Development in the Arab region" which is scheduled to be published by ESCWA this month. We will highlight what technologies are most relevant to the Arab region and what characterizes the fourth industrial revolution. In addition, we will briefly address the impact on the job market and more importantly how can we prepare for a future we don't know.

2. Hosam A. Ibrahim Elzembely: Artificial Intelligence in the Wake of the Fourth Wave: The Egyptian Society for Science Fiction. This talk revolves around the Egyptian Society for Science Fiction and the contributions of its members, as well as a discussion of some of their work, shedding light on science fiction writing in Arabic. The Egyptian Society for Science Fiction (ESSF) was founded in the first decade of the 21st Century and has been described as “the first registered and founded society that specifically tackles this branch of literature, by Professor Hosam El Zembely, an ophthalmologist and surgeon, and an author in the genre of science fiction and scientific culture. The Society’s members range from the younger generation to the well-established writers, critics, and publishers in this field.” Due to unfortunate administrative and bureaucratic difficulties, as well as the current context, it is still undergoing the process of being fully established. However, due to the members’ enthusiasm and contributions, the work began without any governmental or state support. These activities of the Society and their work includes hosting cultural events, publishing anthologies, organizing competitions around the issues and themes in this significant genre, and participating in local, regional, and continental conferences that foster this kind of literature.

3. Muhammad Aurangzeb Ahmad: What is the relationship between Islamic thought and futurism/science fiction? Almost all traditional societies were characterized by imagining a past where the world was in harmony, and the present should always try to look up to that Golden Age; the Islamic civilization is no exception. Two contrasting worldview are present in Islamic conceptualizations of the future: A pessimistic one where the present and the future are meant to get worse as history unfolds itself towards its final fulfillment, and an optimistic one where humans as custodians (khalifa) of the world are obliged to create a better world. The former is characterized by suspicion around new technologies e.g., earlier fatwas against Blockchain, Printing Press, Loudspeakers etc. The latter gave us the Islamic Golden Age, the Golden Age of West Africa etc. Some researchers have argued that Ibn al-Nafees wrote the first work of Science Fiction almost a thousand years ago, and Arabian nights have elements of proto-sci-fi e.g., robots, interplanetary travel etc. Near present examples include Ruqqiya Sakhawat Hossein's Sultana Dream, Belo's anti-colonial alt-universe novella, Ahmed Sadawi's Frankenstein in Baghdad, Ahmed Tawfiq's Utopia, Yasser Bahjatt's alt history etc. Like all Fiction, the future in sci-fi is actually about the present. Whether the Sci-Fi has a bleak outlook like Ahmed Tawfiq's dystopian novel or Sufi Sci-Fi Utopias from Turkey, it is about either how we think about the present or how we want the future to be. This talk will give an overview of how sci-fi in the Islamic world has been a proxy for the pulse of society. Conceptualizations of the future in Science Fiction in the West are not different from what they are in the wider pop culture i.e., the Arab and the Islamic world is perennially the exotic other confined to the past. If one examines almost any major science fiction TV, movie or novel in the last century or so, one sees the conspicuous absence of Arabs and Muslims. An unstated assumption is that these cultures are passive recipients of technology and thus will take up technology in a similar manner or are unlikely to innovate.

4. Aya El Sharkawy: Speculative Data Futures is a series of short stories, of the fiction sci-fi genre, that explores the intersection of gender and technology in the MENA region. With stories from Egypt, Syria, and Palestine the series sheds light on the notion of a futurism in a conflict-ridden area. Coming onto the Speculative Data Futures project I worked closely with several illustrators to visualize accompanying images for each story. In visualizing a future based on these stories I found myself quite possessed by the potential of imagining and of futurisms.

