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Cyberpunk Urban Fantasies in the Gulf: The Line as an Incubator of Modernization in Saudi Arabia and Beyond****

الفانتازيا الحضرية السايبربنكية في الخليج: مدينة "ذا لاين" حاضنةً للتحديث في السعودية وخارجها

Abstract: The Line is a futuristic city under construction in Saudi Arabia. This study examines its development as an incubator of modernization, seeking to transform the socio-cultural and infrastructural landscape of the country. The study notes how The Line's aspirations are genealogically rooted in a Western cyberpunk imaginary picturing hypermodern cities inhabited by artificial intelligences (AI). It reveals the influence of cyberpunk fiction in shaping the conceptualization of The Line, representing a deliberate break with Saudi Arabia's urban and cultural past. The study critically analyses the role that modernization as a double-edged sword plays in advancing novel ideas inspired by Western culture, while undermining a longstanding part of traditional Saudi culture.

Keywords: The Line; Saudi Arabia; Modernization; Cyberpunk; Artificial Intelligence.

الملخص: تبحث الدراسة في تطوّر مدينة "ذا لاين" في المملكة العربية السعودية، وهي مدينة قيد الإنشاء فائقة التطور وحاضنة للتحديث، تسعى إلى تغيير البنية التحتية والمشهدَين الاجتماعي والثقافي للسعودية. توضح الدراسة أنّ تطلّعات مدينة "ذا لاين" المبنيّة في الأصل على سايبربنك غربي يصوّر مدنًا فائقة الحداثة تسكنها منظومة الذكاء الاصطناعي على نحوٍ يقطع، متعمِّدًا، مع الماضي الحضري والثقافي للبلاد. في هذا السياق، تتناول الدراسة، نقديًا، دور التحديث، بوصفه سلاحًا ذا حدَّين، يعزز الأفكار الجديدة المستوحاة من الثقافة الغربية، ويهدّد، في الوقت نفسه، جذور الثقافة والتقاليد السعودية.

كلمات مفتاحية: ذا لاين؛ المملكة العربية السعودية؛ التحديث؛ السايبربنك؛ الذكاء الاصطناعي.

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Introduction

Modernity is a potent driver of change, capable of transforming society, cultural norms, and the material components of human life, including technology, infrastructure, and the built environment.[1] Historically, such changes have often taken place at an unprecedented pace, triggering cultural shocks and socio-environmental transformations whose adverse consequences have outweighed their benefits, particularly in relation to issues of urbanization.[2]

This paper focuses on the complex relationship between the Gulf and modernity, with an emphasis on urban development processes. Since the discovery of vast oil reserves in the 1930s, several Gulf cities have acted as incubators of modernization, giving rise to hypermodern architectures in desert environments. The desert landscape itself has played a significant role in shaping the region's urbanization and modernization, further accentuated by the historical absence of large, ancient cities across the Arabian Peninsula.[3] In this context, the desert has been controversially interpreted by modernizers in the Gulf as a *tabula rasa*: a blank canvas where dreams of modernity may be drawn and realized in the shape of new metropolises, without necessarily conforming with the region's urban past. Urban modernity, therefore, can be understood as a drastic break with the past, propelled by the will to start anew.[4] As Zaidan and Abulibdeh note in the case of Gulf cities, such an inclination has been recurringly coupled with the assumption that local traditions and cultures are "inferior to their 'modern' Western counterparts".[5] However, tensions inevitably arise when idealized visions of modernity confront the realities of specific geographical and cultural contexts. These tensions, and the way they are (re)produced by urban modernity in the Gulf today, are the core focus of this paper.

Theoretically, this paper embraces Molotch and Ponzini's[6] twofold approach, which captures the uniqueness of specific Gulf cities, while simultaneously "de-exceptionalizing" them, to flesh out both the region's distinct geographies and its connections with global urban trends. As Molotch and Ponzini argue, this approach generates insights that extend beyond the Gulf and contribute to contemporary urban theory.[7] At the same time, this perspective enriches understandings of the Gulf by providing case studies that reveal the constant, rapid, and multifaceted Arab urban evolution in the 21st century. In this regard, the existing literature on experimental cities akin to The Line supports Molotch and Ponzini's approach.

Empirically, this paper centres on The Line, a new city currently under construction in Saudi Arabia as part of the ambitious NEOM megaproject. Promoted by a state-owned company led by the Crown Prince and de facto ruler Mohammed bin Salman (MBS), The Line is envisioned as a model of the city of the future: a high-tech, urban settlement designed to accommodate, in theory, nine million residents within a linear built environment extending 170 km in length. Initially slated for completion in 2030, the project will arguably have repercussions on the infrastructure, politics, and culture of Saudi Arabia and beyond, regardless of its eventual material form.

The paper draws on fieldwork conducted between 2022 to 2024 in Saudi Arabia and in Venice, where the NEOM project was officially showcased in 2023 during the Biennale di Venezia. The research is grounded in over 30 semi-structured interviews with NEOM representatives and concept artists involved in the initial phase of The Line's conceptualization. To protect the anonymity of participants, neither their names nor their specific roles within the NEOM project are disclosed.

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[1] Marshall Berman, *All That is Solid Melts into Air: The Experience of Modernity* (London/ New York: Verso, 1983); Federico Cugurullo, *Frankenstein Urbanism: Eco, Smart and Autonomous Cities, Artificial Intelligence and the End of the City* (London: Routledge, 2021), p. 12.

[2] Cugurullo, *Frankenstein Urbanism*; David Harvey, *The Condition of Postmodernity: An Enquiry into the Origins of Cultural Change* (London: Wiley-Blackwell, 1991), pp. 3-4.

[3] Hassan al-Khayyat, *al-Madīna al-ʿArabiyya al-Khalījiyya: Ishkāliyyat al-Aṣāla wa-l-Muʿāṣara fī al-Takhṭīṭ wa-l-ʿImāra* (Doha: Qatar University, 1988).

[4] Cugurullo, *Frankenstein Urbanism*, p. 125.

[5] Esmat Zaidan & Ammar Abulibdeh, "Master Planning and the Evolving Urban Model in the Gulf Cities: Principles, Policies, and Practices for the Transition to Sustainable Urbanism," *Planning Practice & Research*, vol. 36, no. 2 (2021), p. 196.

[6] Harvey Molotch & Davide Ponzini (eds.), *The New Arab Urban: Gulf Cities of Wealth, Ambition, and Distress* (New York: NYU Press, 2019), pp. 2-3.

[7] Ibid.

Building on a review of the academic literature on experimental cities in the Gulf, the analysis begins by identifying three main waves of modernization triggered by the development of The Line. The paper then traces the genealogy of the project's modernization, showing how its underlying aspirations are deeply rooted in a Western cyberpunk imaginary picturing hypermodern metropolises populated and managed by AI. In its final section, the paper reflects on the role of modernization within and beyond the Saudi context. With its impetus of modernity, The Line has the power of modernizing not only Saudi Arabia, but also the way other places beyond the Gulf are understanding and using AI. Yet, as modernity always comes with a price, it remains to be seen what The Line will leave behind in its rush toward the future.

Modernization in Experimental Gulf Cities

When it comes to experimental cities, the Gulf has a relatively recent and yet already rich urban history. This is a geographical area where, especially over the past couple of decades, ambitious urban megaprojects have abounded.[8] Within this strand of urbanization, *ex novo* experimental urban projects deserve special attention since they belong to the same type of urbanism that The Line is part of. What distinguishes these spatial formations is, first and foremost, the nature of the space in which they are developed. These are *ex novo* urban projects in the sense that, geographically, their construction takes place in underdeveloped areas where urban infrastructure is built from scratch.[9] Infrastructurally, new technologies play a prominent role, and the built environment is used to test them as a way to experiment with alternative forms of urban management, such as automated energy grids and anticipatory interventions based on predictive algorithms.[10] Philosophically, modernity permeates the ethos of urban experimentation, with new cities and districts designed as a medium to advance alternative social and spatial structures, often in a deliberate attempt to break with the past.[11]

The study of Masdar City, for instance, a new master-planned urban project developed in Abu Dhabi, has been helpful not simply to comprehend how urbanization, specifically in the United Arab Emirates, has become an instrument to diversify regional economies and move away from oil and gas.[12] It has also illuminated aspects of international urban phenomena, including experiments in ecological urbanism, the formation of smart cities and the automation of urban infrastructure, that have resonated with global theoretical literature on the contemporary city.[13] The masterplan of Masdar City is a prominent example

[8] Ali A. Alraouf, "The Urban Megaprojects Paradigm in Qatar: A Holistic Criticism and Premeditated Prophecy," *Journal of Urban Research and Development*, vol. 1, no. 1 (2020), p. 30; Davide Ponzini, "Large Scale Development Projects and Star Architecture in the Absence of Democratic Politics: The Case of Abu Dhabi, UAE," *Cities*, vol. 28, no. 3 (2011), pp. 251-259; Agatino Rizzo, "Sustainable Urban Development and Green Megaprojects in the Arab States of the Gulf Region: Limitations, Covert Aims, and Unintended Outcomes in Doha, Qatar," *International Planning Studies*, vol. 22, no. 2 (2017), pp. 85-98.

[9] Jasmine Ali & Sarah Moser, "New Cities for a 'New Kuwait': Planning for National Continuity and Stability," *International Planning Studies*, vol. 29, no. 3 (2024), pp. 252-267; Federico Cugurullo, "Urban eco-modernisation and the Policy Context of New eco-city Projects: Where Masdar City fails and why," *Urban Studies*, vol. 53, no. 11 (2016), p. 2417.

[10] Cugurullo, *Frankenstein urbanism*; Sarah Moser, "New Cities: Old Wine in New Bottles?," *Dialogues in Human Geography*, vol. 5, no. 1 (2015), pp. 31-35; Femke Van Noorloos & Marjan Kloosterboer, "Africa's New Cities: The Contested Future of Urbanisation," *Urban Studies*, vol. 55, no. 6 (2018), pp. 1223-1241; Ying Xu et al., "The Emergence of Artificial Intelligence in Anticipatory Urban Governance: Multi-Scalar Evidence of China's Transition to City Brains," *Journal of Urban Technology* (2024), pp. 1-25.

[11] Cugurullo, *Frankenstein urbanism*, p. 1.

[12] Cugurullo, "Urban eco-modernisation and the Policy Context of New eco-city Projects," pp. 2417-2433; Federico Cugurullo & Davide Ponzini, "The Transnational Smart City as Urban Eco-Modernisation: The Case of Masdar City in Abu Dhabi," in: Karvonen Andrew (ed.), *Inside Smart Cities: Place, Politics and Urban Innovation* (London: Routledge, 2018), pp. 149-162; Steven Griffiths & Benjamin K. Sovacool, "Rethinking the Future Low-Carbon City: Carbon Neutrality, Green Design, and Sustainability Tensions in the Making of Masdar City," *Energy Research & Social Science*, vol. 62 (2020), p. 101368.

[13] Federico Cugurullo, "Exposing Smart Cities and Eco-Cities: Frankenstein Urbanism and the Sustainability Challenges of the Experimental City," *Environment and Planning A: Economy and Space*, vol. 50, no. 1 (2018), pp. 73-92; Federico Cugurullo, "Urban Artificial Intelligence: From Automation to Autonomy in the Smart City," *Frontiers in Sustainable Cities*, vol. 2 (2020), p. 38; Katharina Mueller & Sgouris P. Sgouridis, "Simulation-Based Analysis of Personal Rapid Transit Systems: Service and Energy Performance Assessment of the Masdar City PRT Case," *Journal of Advanced Transportation*, vol. 45, no. 4 (2011), pp. 252-270.

of this strand of urbanization.[14] Built in a previously underdeveloped area of Abu Dhabi, next to Zayed International Airport, Masdar City mostly consists of cutting-edge infrastructure for testing a wide technological portfolio, including robotics, clean tech, and energy storage solutions.[15] Experimentation in Masdar City has been advancing at a fast pace.[16] It is here that scholars have noted one of the earliest manifestations of the transition from *automation* to *autonomy* in the contemporary city, whereby AI begins to take control of urban systems autonomously rather than merely executing automated protocols designed by engineers and computer scientists.[17] In this sense, a project like Masdar City has been at the forefront of urban experimentation, pioneering an "urbanism influenced by artificial intelligences", or in other words, an *AI urbanism*.[18]

However, critiques of these projects have focused on the tensions arising from the clash between the aspirations of modernity and the realities of specific geographical and cultural contexts. In the Gulf, such tensions relate not only to the environmental constraints of building large cities and sustaining sizable societies in a region with limited natural resources, such as freshwater.[19] They also pertain to the delicate relationship between Islam and modernity, as modern understandings of society can conflict with longstanding cultural perceptions and norms grounded in religion.[20]

The Line was initially proposed for completion in 2030. As an extensive corpus of literature on experimental urbanism suggests, such urban experiments are seldom built according to the original vision and masterplan, but it is important to note that, at the time of writing, the implementation of The Line continues in the region of Tabuk.[21] Therefore, in light of what the relevant academic literature suggests and, above all, MBS' significant financial and political investment in the NEOM project, it is likely that some version of The Line will ultimately materialize. Moreover, given that The Line is woven by the technological, political, and cultural terms of modernity, we can suggest that, whatever the emergent material form of the project, it will have repercussions on the infrastructure, politics, and culture of Saudi Arabia and beyond that will be difficult to control.

A Genealogy of The Line's Modernization

Despite being promoted by its developers as a groundbreaking novel model of urbanism, much of The Line is, in fact, deeply rooted in the past. The design itself, for instance, is far from novel. In the late 19th century, modernist urban planner Arturo Soria y Mata conceptualized a linear urban settlement that was subsequently built near Madrid where it can be still seen today, albeit since consumed by the expanding capital, and now forming a suburban district.[22] Echoes of Soria's vision can also be found in Soviet urban

[14] Federico Cugurullo, "How to Build a Sandcastle: An Analysis of the Genesis and Development of Masdar City," *Journal of Urban Technology*, vol. 20, no. 1 (2013), pp. 23-37; Gökçe Günel, *Spaceship in the Desert: Energy, Climate Change, and Urban Design in Abu Dhabi* (Durham: Duke University Press, 2019), p. 10.

[15] Griffiths & Sovacool, p. 9.

[16] Federico Cugurullo, "Speed Kills: Fast Urbanism and Endangered Sustainability in the Masdar City Project," in: Datta Ayona & Shaban Abdul (eds.), *Mega-Urbanization in the Global South* (London: Routledge, 2017), pp. 78-92.

[17] Cugurullo, *Urban Artificial Intelligence*, p. 38.

[18] Benjamin Bratton, "AI Urbanism: A Design Framework for Governance, Program, and Platform Cognition," *AI & Society*, vol. 36, no. 4 (2021), pp. 1307-1312; Federico Cugurullo et al. (eds.), *Artificial Intelligence and The City: Urbanistic Perspectives on AI* (London: Taylor & Francis, 2023), pp. 11-71; Otello Palmini & Federico Cugurullo, "Charting AI Urbanism: Conceptual Sources and Spatial Implications of Urban Artificial Intelligence," *Discover Artificial Intelligence*, vol. 3, no. 1 (2023), p. 15.

[19] John A. Burt, "The Environmental Costs of Coastal Urbanization in the Arabian Gulf," *City*, vol. 18, no. 6 (2014), pp. 760-770.

[20] Jan-Erik Lane & Hamadi Redissi, *Religion and Politics: Islam and Muslim Civilisation* (London: Routledge, 2016); Fazlur Rahman, *Islam & Modernity: Transformation of an Intellectual Tradition*, vol. 15 (Chicago: University of Chicago Press, 2017); Hamadi Redissi, *La tragédie de l'islam modern* (Paris: Média Diffusion, 2011), p. 20.

[21] Cugurullo, *Frankenstein Urbanism*; James Evans et al., *The Experimental City* (London: Routledge, 2016); Robert Fishman, *Urban Utopias in the Twentieth Century: Ebenezer Howard, Frank Lloyd Wright, Le Corbusier* (Cambridge: The MIT press, 1982), p. 300.

[22] Michael Batty, "The Linear City: Illustrating the Logic of Spatial Equilibrium," *Computational Urban Science*, vol. 2, no. 1 (2022), p. 8.

planning of the late 1920s, as well as in the provocative architectural drawings of Superstudio's *Monumento Continuo* in the 1960s. The Line, therefore, is not the first linear city in history; rather, its design draws from an imaginary heavily influenced by Western ideals of urban modernity and an aesthetic preoccupation with geometric forms. In relation to three specific waves of modernization, namely technology, governance, and citizenship, and the way they intertwine in the development of The Line, the influence of ideas from a distant past continues to be strong.

One Western cultural and aesthetical movement in particular has significantly informed the genesis and development of The Line: *cyberpunk*. The culture and aesthetics of cyberpunk are rooted in Western science fiction of the 1960s, when Philip K. Dick's classic novel *Do Androids Dream of Electric Sheep?* (1968) contributed to the formation of an imaginary characterized by human and artificial intelligences populating high-tech urban environments. The cyberpunk genre was further solidified in the 1980s with the publication of William Gibson's *Neuromancer* (1984), where the themes of AI and its societal implications feature prominently. During the same decade, Ridley Scott released the iconic movie *Blade Runner* (1982), which was inspired by Dick's novel and grounded in the aesthetics of then sprawling megacities such as Hong Kong and Tokyo. The movie introduced a visual imaginary of cyberpunk cities characterized by monumental architectures, neon lights, and cutting-edge technologies, including flying cars and androids. This imaginary has been recently revitalized through *Blade Runner*'s sequel, *Blade Runner 2049* (2017) and a blockbuster videogame *Cyberpunk 2077* (2020), both of which have captivated younger generations and revived the cyberpunk movement.

That cyberpunk is at the core of the imaginary underpinning The Line is a fact that has emerged multiple times in the process of empirically researching the new Saudi megaproject, by engaging directly with Neom representatives through semi-structured interviews and published material by Neom, in Saudi Arabia and at international promotional events. More specifically, it emerged that MBS explicitly cited *Blade Runner* and its sequel as key references for the kind of city that he wanted to build. As one NEOM spokesman confirmed, this reference was communicated to the architects and concept artists tasked with sketching the initial vision of The Line, with the idea of informing the design process. It is therefore no coincidence that many of the technologies proposed for implementation in The Line, such as androids and flying cars, closely resemble those portrayed in Scott's movies.

Moreover, cyberpunk can be identified as a key influence on NEOM, as evidenced by the materials released by the project, and exhibited at international promotional events, such as the 2023 Venice exhibition. These publications articulate a distinct "punk language" for NEOM, as a kind of identifying ethos that distils and captures MBS' envisioned aesthetic for the project within a vernacular of disruption and break with the past. This ethos reflects a central imperative of modernisation, echoing Ezra Pound's slogan "Make it New".[23] As proclaimed by the developers, this punk genre of NEOM can be further divided into sub-genres, including "desertpunk", "dieselpunk", "solarpunk", and "nanopunk", among others, which constitute the inspirations behind NEOM's design.

And yet, the link between NEOM and punk within the context of governance in Saudi Arabia appears somewhat antithetical. The punk movement originally emerged in the United States and the United Kingdom in the 1970s as a counter-cultural movement against the political establishment and conservatism, often manifesting through DIY interventions in the urban fabric and cultural products. Therefore, references to "punk" as a source of inspiration for NEOM and The Line suggest a detachment from the movement's historical roots, and a kind of empty deployment of "punk" as an aesthetic within the fantastical façades, without the depth of punk's political imperatives. The Line is envisioned as a city designed to fulfil and

[23] Ezra Pound, *Make It New: Essays by Ezra Pound* (London: Faber and Faber, 1934).

predict all citizens' needs, effectively leaving no room for DIY, make-shift, or low-tech interventions by its citizens.

The AI-city nexus is a prominent leitmotif in cyberpunk literature and the plan for the development and management of The Line resonates with it. The new Saudi city is technologically imagined as a high-tech urban system mediated by multiple autonomous AIs, a vision genealogically connected to cyberpunk works like *Neuromancer*, where Gibson anticipates a variety of human-AI relationships and stresses their complex evolution in modern urban societies.[24] In the fictional cities that Gibson depicts, the protagonists interact with robotic technologies such as gardening robots tasked with maintaining urban spaces. Some of these robots are controlled by a large-scale AI (named *Wintermute*, in Gibson's imaginary), akin to how a real-life AI system called *Neos* is supposed to function as The Line's digital brain. Above all, the cyberpunk movement emphasizes the socio-cultural relationships between human and AI, often remarking the differences between the human mind and machines, and presenting a seemingly homogeneous society in which androids are barely distinguishable from human beings. In this regard, The Line's futuristic societal vision of a polity composed of robots mirrors a typical cyberpunk topos.

This is a topos that, together with the other cyberpunk themes identified in this section, is grounded in a Western imaginary that appears markedly distant from Saudi traditions and culture. The issue of robotic citizenship is a case in point. While Western cyberpunk novels and movies have long pictured societies inhabited by humanoid AIs, Saudi society has historically embraced Islam as a *conditio sine qua non* for obtaining citizenship in the country. Within this socio-cultural context, the trend initiated by The Line to grant Saudi citizenship to a robot called Sophia, built by Hanson Robotics, marks a radical departure from local culture.

It is important to note that this extreme act of modernization is neither an isolated phenomenon, nor a purely cultural matter. Since MBS' rise to power in 2017, Saudi Arabia has undergone major cultural changes, including the diffusion of forms of entertainment, such as concerts and cinemas, that had been hitherto considered impure by Saudi clerics according to Wahhabi precepts.[25] These changes form part of MBS' broader effort to modernize Saudi culture and revamp its international reputation, which, in turn, is embedded within a broader politico-economic strategy aimed at diversifying the national economy by developing new industries comprising tourism, media, and entertainment.[26] The Line can be thus understood as one among several vectors of modernization through which MBS is reshaping Saudi Arabia. What makes this urban project peculiar is, however, its underpinning cyberpunk imaginary which bears little, if any, connection to Saudi culture and, in some ways, clashes against it.

Modernization In and Beyond The Line

Since cyberpunk has influenced the conceptualization of NEOM in ways that represent a deliberate rupture with Saudi Arabia's urban and cultural past, modernization appears as a double-edged sword: it advances technological, political, and cultural transformation, yet simultaneously promotes ideas and technologies that – due to their Western roots – may challenge substantial elements of Saudi traditions and culture. The Line, driven by modernity, possesses the capacity not only to modernize Saudi Arabia itself, but also to reshape how regions beyond the Gulf understand and utilize AI.

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[24] Carl Gutiérrez-Jones, "Stealing Kinship: Neuromancer and Artificial Intelligence," *Science Fiction Studies*, vol. 41, no. 1 (2014), pp. 69-92.

[25] Stéphane Lacroix, "Saudi Arabia and the Limits of Religious Reform," *The Review of Faith & International Affairs*, vol. 17, no. 2 (2019), pp. 97-101.

[26] Anis Ali & Anas A. Salameh, "Role of Travel and Tourism Sector in the Attainment of Vision 2030 in Saudi Arabia: An Analytical Study," *Problems and Perspectives in Management*, vol. 19, no. 2 (2021), pp. 276-290; Daniel Moshashai et al., "Saudi Arabia Plans for its Economic Future: Vision 2030, the National Transformation Plan and Saudi Fiscal Reform," *British Journal of Middle Eastern Studies*, vol. 47, no. 3 (2020), pp. 381-401.

The Line's ambitious path toward modernity can be divided into three strands. The first is technological in nature and concerns the extensive deployment of AI to modernize urban infrastructure. In this context, modernization is conceived as the autonomous management of urban systems and the delivery of services, with AI positioned as an active agent in the management of the city. For example, The Line's transportation system is supposed to operate autonomously through a wide array of cutting-edge technologies, including self-driving vehicles such as those designed by Volocopter – a German company specializing in autonomous helicopters that are currently being tested in Saudi Arabia. Another example pertains to aspects of The Line's supply chains, including energy and everyday consumer goods, which, according to developers, will largely be produced in Oxagon, another newly planned city in the Tabuk region. Oxagon is imagined as an industrial hub entirely populated and managed by robots tasked with producing essential goods for future NEOM inhabitants. From this perspective, the vision of modernization underpinning The Line is one in which the city is permeated by such an advanced technology that human are minimally involved while AI runs their environment.

The second strand of The Line's modernization concerns governance where, once again, AI plays a pivotal role in the developers' imaginary. The large-scale AI system, *Neos*, is envisioned as the central command structure overseeing every aspect of the city's infrastructure, as well as the network of subsidiary AIs embedded in autonomous vehicles and robots. Neos is conceptualized as a gigantic digital brain capable not only of seeing what is happening in the city, but also of predicting future developments through the use of advanced predictive algorithms. These algorithms process large volumes of data concerning urban activities and apply them to forecast the evolution of urban systems and services. Within The Line, this technology is being imagined as an instrument to modernize governance and proactively anticipate future scenarios and citizens' needs, as opposed to merely reacting and responding to events as they unfold. Examples provided by the developers include autonomous vehicles anticipating where and when citizens will need transportation, domestic robots predicting meal preferences, and algorithms forecasting potential criminal activities before they occur. In this sense, modernization in The Line is about using technology to have more pervasive control not only over the intricate coordination of urban mobilities and activities, but also over time itself, by extending governance into the future.

The third strand of modernization observable in The Line concerns the notion and practice of citizenship. Here, AI continues to serve as a common denominator in the recent Saudi efforts to modernize the country. Within the context of the NEOM megaproject, AI is conceptualized not simply as a technology or tool, but as a form of intelligence endowed with human-like qualities and, thus, seen as deserving rights comparable to those of human beings. The Line's vision of modernization anticipates a future society in which robots are granted citizenship and coexist with humans as urban inhabitants. This is not merely a hypothetical vision of the future; it reflects a concrete plan of action initiated by MBS in 2017, when the robot Sophia was officially granted Saudi citizenship during the launch of NEOM. In this sense, Sophia represents an actual expression of modernization aimed at transforming the Saudi society by pioneering unprecedented types of citizenship. Moreover, the original plans for The Line include a vision in which up to 50% of the population would consist of service robots, further underscoring the ambition to build a hybrid, organic-digital society. In this respect, The Line shows a powerful facet of modernity, wherein technological innovation triggers profound social and cultural changes, and AI challenges long-standing anthropocentric frameworks of social organization.

The three strands of modernization expressed by The Line present elements of novelty within the Saudi context and beyond. The philosophy of modernity often regards the past as a constraint on development and seeks to surpass it by establishing unprecedented dynamics of progress. From a

technological standpoint, the high-tech portfolio being developed within The Line, with a focus on AI, represents a drastic change compared to other regions in Saudi Arabia. The country has only recently begun to engage with smart-city initiatives, and – with few exceptions – its urban infrastructure remains relatively underdeveloped.[27]

Similarly, the use of AI and predictive algorithms in urban governance stands out as an exceptional strategy. While MBS has long invested in digital technologies and narrow AI, particularly within the realm of social media, as a means of consolidating his power,[28] the ambitions embodied in The Line through the establishment of Neos are without parallel in the Gulf. Furthermore, The Line's waves of innovation stand out even beyond the regional context. Saudi Arabia's strategic experimentation with AI in urban infrastructure and governance through the NEOM megaproject has few global analogues. The rapid pace of innovation and, above all, the sheer scale and ambition of NEOM, place Saudi Arabia at the forefront of AI-driven urbanism, alongside countries like China and the United States. Experiments in AI urbanism are now gaining momentum.[29] The extensive deployment of autonomous urban technologies planned in The Line resembles the modernization via AI currently underway in several Chinese cities.[30] Similarly, NEOM's use of predictive algorithms resonates with current practices of so-called anticipatory governance, which have recently emerged particularly in Asian authoritarian regimes.[31]

In these terms, Saudi Arabia is part of a nascent AI urbanism that, as a global urban trend, is reshaping the structure and management of cities on a planetary scale. The Line contributes to this shift through what is arguably the most ambitious urban AI experiment to date. In addition, it is pioneering unprecedented dynamics of AI urbanism, most notably through the case of the robot Sophia which marks the first case of robotic citizenship in history. The Line also functions as a socio-cultural experiment, one that challenges established conventions regarding the meaning and requirements of citizenship in the 21st century.

Conclusion

This paper has discussed the development of The Line as a vector of modernization in Saudi Arabia, which is generating repercussions extending beyond the Gulf. Due to its experimental nature, the future of The Line is difficult to predict. Nevertheless, the project has already had an impact at both regional and international levels despite being in the early stages of construction. Internationally, by placing itself at the forefront of urban experimentation, Saudi Arabia – through NEOM – is contributing to the evolution of AI urbanism.[32] In many ways, this marks a continuation of the passage from *automation* to *autonomy*. However, The Line attempts to push this paradigm further by rendering urban infrastructure and urban governance fully autonomous. In addition, the case of Sophia denotes an unprecedented attempt to develop robot citizens

[27] Yusuf A. Aina et al., "Top-Down Sustainable Urban Development? Urban Governance Transformation in Saudi Arabia," *Cities*, vol. 90 (2019), pp. 272-281; Abdulaziz I. Almulhim & Patrick Brandful Cobbinah, "Can Rapid Urbanization Be Sustainable? The Case of Saudi Arabian Cities," *Habitat International*, vol. 139 (2023), p. 102884.

[28] Andrew Leber & Alexei Abrahams, "A Storm of Tweets: Social Media Manipulation During the Gulf Crisis," *Review of Middle East Studies*, vol. 53, no. 2 (2019), pp. 241-258.

[29] Federico Cugurullo et al., "The Rise of AI Urbanism in Post-Smart Cities: A Critical Commentary on Urban Artificial Intelligence," *Urban Studies*, vol. 61, no. 6 (2024), pp. 1168-1182; Otello Palmini & Federico Cugurullo, "Design Culture for Sustainable Urban Artificial Intelligence: Bruno Latour and the Search for a Different AI Urbanism," *Ethics and Information Technology*, vol. 26, no. 1 (2024), p. 11; Aidan H. While et al., "Urban Robotic Experimentation: San Francisco, Tokyo and Dubai," *Urban Studies*, vol. 58, no. 4 (2021), pp. 769-786; Tan Yigitcanlar et al., "Artificial Intelligence and the Local Government: A Five-Decade Scientometric Analysis on the Evolution, State-of-the-Art, and Emerging Trends," *Cities*, vol. 152 (2024), p. 105151.

[30] Simon Marvin et al., "Urban AI in China: Social Control or Hyper-Capitalist Development in the Post-Smart City," *Frontiers in Sustainable Cities*, vol. 4 (2022), p. 1030318.

[31] Ying Xu et al., p. 3.

[32] Cugurullo et al., *Artificial Intelligence and the City*, p. 361

operating within a broader AI infrastructure. As urban geographical literature has extensively documented, such urban experiments are inherently problematic, risky, and often produce uncertain results.[33] Yet these are experiments capable of generating policy impact on future cities.[34]

Regionally, The Line is transforming a segment of Saudi Arabia's infrastructure by introducing new dynamics of AI-mediated urban governance and citizenship. In this regard, this paper has observed the influence of an imaginary grounded partly in science fiction, whereby new urban spaces and social structures are largely detached from the surrounding context. To some extent, this trend echoes existing practices in the Gulf where a rare combination of desert landscapes and the absence of large, ancient cities has often led local planners to draw inspiration from external models.[35] However, The Line's futuristic imaginary inspired by the recent promises of AI is also part of a broader zeitgeist, as urban policymakers worldwide are lured by AI urbanism and its ideology.[36] Overall, this scenario reinforces Molotch and Ponzini's[37] proposition: that the study of Gulf cities sheds light on both the changing nature of the Arab urban and, more generally, of cities in the 21st century.

With a focus on modernization, understood as a double-edged driver of change, this paper has emphasized the repercussions of The Line within Saudi Arabia. The new city is introducing some changes that are disconnected from the cultural traditions of the region. As this paper has shown, a cyberpunk imaginary largely rooted in Western 1980s culture has been central to The Line's design and conceptualization. In this respect, the Saudi project exemplifies a common issue in urban modernity: the formation of modern cities and urban cultures that remain insensitive to the cultural roots of the surrounding space. This issue has also manifested more broadly across the Arab world where Western cultural movements can clash with Islamic traditions and coalesce into a fragmented and unstable whole.[38] Viewed from this lens, The Line's cyberpunk character appears to foster cultural transformations that are misaligned with Saudi Arabia's traditional norms and practices.

The implications of such transformations should not be underestimated, and, in this regard, history offers valuable lessons for Saudi Arabia and the Gulf more broadly. In the 1930s, when King Abdulaziz Al Saud (r. 1926-1932), founder of the third Saudi state, introduced several technological innovations such as motor vehicles, not only to modernize the region, but also to consolidate his authority, he faced significant opposition from a group of Muslim fundamentalists. Some ulama regarded then modern technology as *bidʿa* – an innovation lacking roots in the traditional practice of Wahhabism.[39] This sparked a series of violent conflicts that persisted into the 1960s and 1970s. Notably, in September 1965, a television studio in Riyadh was attacked.[40] As Nevo notes, the protesters at times "were joined and even led by members of the state's ulama, who, despite being on the government payroll, feared that Western culture and technology would threaten the traditional Saudi-Wahhabi way of life".[41] As this paper has emphasized, there is little to no connection between the cyberpunk fantasies underpinning The Line and the traditions of Saudi Arabia. As MBS' project continues to expand and reshape Saudi culture, the question remains: will history repeat itself and lead to renewed conflict between those advocating for modernity and those who feel threatened by it?

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[33] Ali & Moser; Cugurullo, *Frankenstein Urbanism*; Van Noorloos & Kloosterboer.

[34] I-Chun Catherine Chang, "Failure Matters: Reassembling Eco-Urbanism in a Globalizing China," *Environment and Planning A: Economy and Space*, vol. 49, no. 8 (2017), pp. 1719-1742.;

[35] al-Khayyat, pp. 1-2.

[36] Cugurullo et al., *Artificial Intelligence and the City*, p. 361; Federico Cugurullo, "AIdeology: Unpacking the Ideology of Artificial Intelligence and Its Spaces," *Antipode* (2025), pp. 1-2.

[37] Molotch, & Ponzini, pp. 10-11.

[38] Redissi, pp. 100-101.

[39] Joseph Nevo, "Religion and National Identity in Saudi Arabia," *Middle Eastern Studies*, vol. 34, no. 3 (1998), pp. 34-53.

[40] Ibid.

[41] Ibid., pp. 39-40.

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