## The Urban Singularity—Envisioning the Future of Cities

#### El Moussaoui Mustapha

Faculty of Design and Art, Free University of Bolzano, Bolzano39100, Italy

Abstract: This paper is a hypothetical exploration of the connections between teleological evolution, the Omega Singularity, and the future of cities, weaving together insights from a diverse array of disciplines. Our investigation delves into the possibility that cities are evolving towards a Singularity, a state characterized by infinite knowledge, intelligence, and adaptability, which would bring about a radical transformation of urban environments and their underlying dynamics in the 21st century and beyond. At the heart of this exploration lies the role of language and time as crucial dimensions of the Urban Singularity. Moreover, we examine how linguistic developments and cross-cultural exchanges can foster more inclusive, adaptable, and resilient urban environments, while also highlighting the need for advanced technologies and communication modalities that can support the dynamic needs of future cities. Furthermore, the paper investigates the profound implications and transformative potential of merging human consciousness with the urban Singularity. By examining the interplay between these concepts, we seek for a deeper understanding of the potential trajectories and implications of these concepts for the transformation of human society and our relationship with the built environment.

Key words: Omega singularity, future cities, urban development, technological singularity, teleological evolution.

#### 1. Introduction

The future of cities has long captivated scholars, policymakers, and visionaries alike, as rapid urbanization and technological advancements drive unprecedented transformations in urban development and governance [1]. Central to these emerging paradigms is the enigmatic concept of the Omega Singularity, a theoretical notion rooted in teleological evolution, which posits that natural processes, encompassing biological evolution and human history, progress purposefully or directionally towards a predetermined goal or end state [2, 3]. This paper endeavors to unravel the intricate nexus between teleological evolution, the Omega Singularity, and the future of cities, synthesizing insights from philosophy, urban planning, technology, and linguistics to offer a multidisciplinary and forward-looking exploration of urban societies in the 21st century and beyond.

Teleological evolution traces its origins to philosophers like Aristotle, who asserted that natural phenomena could be elucidated by their purpose or final cause [4]. Recently, the Omega Point Theory has revitalized this concept by positing that the universe is inexorably evolving towards a state of unparalleled complexity, knowledge, and intelligence [3]. Applied to urban development, this theory implies that cities are traversing a trajectory towards their own Omega Singularity, epitomized by boundless intelligence, knowledge, and adaptability [5].

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Probing the Omega Singularity and its ramifications for the future of cities demands a multidisciplinary approach that encompasses urban planning, philosophy, technology, and linguistics. Language, as a crucial dimension of human communication and social interaction, carries significant implications for the evolution of cities towards their Urban Singularity [6] by working first to its *technological singularity*. Hence the city fuses human consciousness, technology, nature, and the built environment to become an Singularity, in a sense that is like an organism, that is unique and resilient.

This paper aims to present a speculative outlook on the trajectory of urban development and the possible consequences of these notions for human society.

**Corresponding author:** Mustapha El Moussaoui, Ph.D., Assistant Professor, Alternative urban futures.

### 2. Teleological Evolution and the Omega Point Theory

The Omega Singularity and Teleological Evolution Theory are two interrelated concepts that seek to explain the ultimate purpose and direction of the universe [7]. The Omega Singularity is a hypothesized point in the future where all intelligence converges [7], while Teleological Evolution Theory posits that the universe is driven by an inherent purpose or goal [8]. Although these ideas have their roots in philosophical and theological traditions, recent advancements in fields such as cosmology and AI (artificial intelligence) have lent new credence to their plausibility [9, 10]. The concept of the Omega Singularity can be traced back to the work of French philosopher and paleontologist Teilhard de Chardin [8], who proposed the idea of an "Omega Point" as a culmination of cosmic evolution. This idea was further developed by mathematician and physicist Frank J. Tipler [7] in his book The Physics of Immortality, where he presented the Omega Point as a cosmological singularity where all intelligence in the universe ultimately converges. Tipler's work has since been met with both enthusiasm and skepticism within the scientific community [11, 12]. On the other hand, Teleological Evolution Theory, which posits that the universe is guided by an inherent purpose, has its origins in the ancient philosophical notion of teleology [4]. Teleological thinking, which suggests that natural processes are directed towards specific goals or ends, has been central to various philosophical, religious, and scientific traditions throughout history [13]. More recently, the idea of Teleological Evolution has been revisited in the context of cosmic evolution and the development of AI [9, 10]. One of the primary arguments in favor of Teleological Evolution Theory is the apparent fine-tuning of the universe's physical constants, which some researchers argue suggests the existence of an underlying purpose or design [14, 15]. Critics of Teleological Evolution Theory, however, contends that this apparent fine-tuning can be better explained by anthropic reasoning or the multiverse

hypothesis [16].

The interrelationship between the Omega Singularity and Teleological Evolution Theory is evident in the shared emphasis on the convergence of intelligence and the purpose-driven nature of the cosmos [7, 8]. Both concepts have important implications for our understanding of the future trajectory of the universe and the role of humanity within it. It might be also seen that these ideas argue that the pursuit of advanced technologies, such as AI and space exploration, can be seen as a means to accelerate our progress towards the Omega Singularity and fulfill the teleological purpose of the universe. These perspectives have significant consequences for the ethics and priorities of scientific research, technological development, and public policy, as they suggest a moral imperative to promote the advancement of intelligence and the dissemination of life throughout the cosmos [17, 18].

However, the Omega Singularity and Teleological Evolution Theory also face numerous challenges and criticisms. Some critics argue that the concepts are inherently speculative and lack empirical evidence, relying instead on philosophical and theological assumptions [14]. Others contend that these ideas might inadvertently encourage a deterministic view of human development, neglecting the importance of individual agency and free will [19, 20]. Moreover, the potential risks associated with the pursuit of advanced technologies, such as AI and space exploration, must be carefully considered in light of the potential benefits they might offer in the context of these theories [21, 22].

Digital philosopher Alex Vikoulov [3] suggests that the cosmic evolution process can be understood as an "algorithmic teleological drive". According to Vikoulov, this drive aims to maximize the utilization of resources and computational efficiency, ultimately leading to the emergence of conscious agents who are capable of steering the universe towards its final state. This idea emphasizes the interconnectedness of intelligence, purpose, and the cosmic process. Furthermore, Vikoulov's work highlights the potential importance of digital physics and information theory in understanding the underlying principles of the universe and its ultimate trajectory. By integrating these concepts, we can gain a more comprehensive understanding of the universe's purpose-driven nature and the role of intelligence in shaping its future.

For the sake of correlating both ideas of Omega singularity and the concept of reaching this Omega point through technological advancements, we will term the concept as *Technological Singularity*, which is the point where humanity reaches a point of advanced technological heights that lead to the technological singularity, a material based concept rather than a spiritual hypothesis.

The Technological Singularity, and the notion of the universe as a self-actualizing cybernetic system can provide a hypothetical insight into the future evolution of cities and urban environments. As the development of advanced technologies and AI progresses, the interconnectedness of intelligence and purpose in the cosmos may be increasingly reflected in the design and organization of future cities.

One way this could manifest is through the creation of smart cities, which leverage the power of AI, big data, and the IoT (Internet of Things) to optimize resource management, transportation, and public services [23, 24]. By maximizing the utilization of resources and computational efficiency in urban environments, future cities may be better equipped to support their inhabitants and contribute to the broader teleological goals of the universe.

Moreover, the ethical implications of the Technological Singularity, which emphasize the moral imperative to promote the advancement of intelligence and the dissemination of life, could play a critical role in shaping the priorities and values of future cities. Urban planners and policymakers may increasingly focus on creating environments that adopt innovation, creativity, and the cultivation of human potential [25]. This could lead to the development of cities that are not only technologically advanced but also designed to nurture the intellectual and emotional well-being of their inhabitants, if utilized properly, and if policymakers adopted strategies that would benefit the general public rather than the elite few.

In his book Point Omega- The Singularity at the End of Time, Kleeman (2001) explains that Point Omega is the point of origin and return in the cosmic cycle and the ultimate point of reference for every possible way of thinking [26]. Kleemann adds that if we follow the stream of consciousness all the way to the supernal spring, we reach the omnipresent point, which is in every atom and at the center of every star, but it is beyond duality and basically above and beyond the mind-space-time universe. Consciousness is the doorway to eternal life, innumerable sources of energy and information, and the key to living forever. Omega Point is the "atomic" and "omnipresent point of consciousness" that is not only the destiny and goal of all lives but also the source of all information and energy, the Alpha or Aleph, through which an infinite number of new and possible worlds are likely to come into being [27]. It is consciousness that is free of all limits and obstacles. It is a consciousness that is both one with the universe and above and beyond it. Omega Point doesn't have to be outside of time and space to be free of all limits and restrictions. Teilhard de Chardin's theory is about the superluminal and instantaneous connection between all events in mind, space, and time in the experience of the eternal present, Point Omega, the singularity beyond the phenomenal universe [26]; an ultimate point of consciousness that the universe is moving toward.

#### 3. Urban Singularity and Time

Many philosophers have had interest in the concept of time and existence. Bergson's ideas about time have had a big impact on Deleuze's thinking about time, *Chronos* is clock time that can be measured in space, but *Aeon* is time itself, so it is not real. It is a force that goes beyond people and time and is driven by the vital élan of life. Chronos is focused on the present

and taking action. Aeon is the endless flow of the past and the future, where the present is just the instant without thickness or length. So, it is always already over and always yet to come [28]. The existential view of time is mostly about the second type of time, which is called "Aeon." Deleuze says that everyone has a different way of seeing time. Each person lives in a different amount of time, or "duree," that is different from other durations [27].

Time is no longer seen as a straight line, with the past, present, and future following each other in order. Instead, it works like a cone, with the past, present, and future scattered everywhere and moving or "becoming" in many different ways and lengths of time. There is no real "present," nor is there a real "past" or "future." Moment by moment, in circular movements, the present "becomes the past" and the future "becomes the present." "Now" is just a point where the recent past and the near future come together and mix. At any given moment, one can either remember the virtual past or imagine the virtual future. This means that one's present is just a concentrated point in an infinite and virtual open whole of time [29]. The idea behind this is that minds and memories change over time. As they go through the different lengths of time at each point in time, they always change or "become."

Drawing on the profound philosophical explorations of time by thinkers like Bergson and Deleuze, we can extend the conceptual framework of Chronos and Aeon to envision the urban singularity where non-organic entities such as buildings can possess their own "duree," or unique duration. In this paradigm, each building would function as a living organism, complete with a real-time data stream that is an amalgamation of its historical essence, material composition, current climatic interactions, and performance metrics. Intersecting with the futuristic patterns and predictions orchestrated by artificial intelligence, the built environment could achieve an unprecedented level of self-awareness and responsiveness.

Such an urban singularity does not exist in isolation;

it is interconnected with the broader ecosystems and the perpetual dynamics of climate change. Within this intricate web, AI becomes the catalyst for continual adaptation, allowing the city to evolve in harmony with the shifting environmental conditions. It's a grand vision that transcends mere architectural or urban planning, but taps into a symbiotic relationship between nature, built environment, and human consciousness.

The idea of the Aeon, where past, present, and future are in constant flux, resonates strongly with this model of an adaptive and resilient city. By embracing a concept of time that rejects the linear and embraces the multi-dimensional, we can begin to see how technology, architecture, and ecology could converge to create urban spaces that are not only sustainable but also deeply attuned to the rhythm of life itself. Here, the city does not just respond to change; it anticipates, learns, and evolves, manifesting the vital élan of life that philosophers have pondered. This vision reimagines the built environment as a complex organism that not only consumes and functions but also 'becomes,' in a constant process of transformation that mirrors the human condition. It is an idea that is grounded in material reality yet reaches toward a profound connection with the most abstract and existential aspects of human experience, all while aiming for the efficient utilization of resources and enhanced resilience.

# 4. Human Consciousness and the Urban Singularity

As cities evolve towards infinite knowledge, intelligence, and complexity, the boundaries between individual human consciousness and the collective intelligence of future cities may become increasingly blurred, giving rise to a shared, symbiotic relationship between humans and their urban environments.

In this context, advancements in neurotechnology, brain-computer interfaces, and AI could pave the way for the direct integration of human minds with the urban omega. This interconnected network of human consciousness would enable individuals to access the collective knowledge and intelligence of the entire city, transcending the limitations of traditional communication and learning modalities (Fig. 1). As urban inhabitants become increasingly interconnected, they may develop a heightened sense of empathy, cooperation, and shared purpose, ultimately fostering a more harmonious and resilient urban society.



Fig. 1 Convergence of a futuristic city into the Omega Singularity.

Source: Midjourney fed by Author's prompt (2023).

Furthermore, the merging of human consciousness with the urban Omega Singularity could lead to the emergence of new forms of art, culture, and creativity, as individuals draw upon the collective wisdom. This shared pool of knowledge and imagination could catalyze the development of the city further on transforming both the physical and social fabric, if utilized well.

#### 5. Language and the Urban Singularity

As cities evolve towards their Singularity, the development and transformation of language will play a critical role in shaping the future of urban societies.

The urban singularity represents a state of perfect

communication and understanding, which suggests that the languages of future cities might evolve to become more efficient, nuanced, and adaptive, facilitating seamless exchanges of ideas and information across diverse cultural and linguistic boundaries [6]. In this context, the advancement of NLP (natural language processing) technologies, machine translation, and AI may significantly impact the way urban inhabitants communicate, allowing for real-time translation and interpretation of various languages, thereby nurturing greater cross-cultural understanding and collaboration [31].

As urban dwellers increasingly engage with digital, new forms of communication may emerge, blending traditional linguistic elements with visual, auditory, and interactive cues. This convergence of physical and digital communication modalities may give rise to hybrid languages that can more effectively convey complex ideas, emotions, and experiences.

The role of language in the future city could extend beyond human-to-human communication, encompassing interactions between humans and various forms of AI, nature, and different species, as we would understand the modalities of communication by deconstructing the patterns in which they use [30]. Such a modality - as mentioned in part three - would help in connecting various existential forms into understanding the best way of collaboration between them, so non could cannibalize the other.

#### 6. Key Dimensions of Future Cities

The term "Singularity" has been used in urban planning differently.

According to Gehlawat, Le Corbusier employed the concept of aesthetic distinctiveness to characterise the city of Chandigarh in India, which he both planned and created [32]. Lynch, explored the relationship between the city's image and the integration of visual design principles, highlighting the connection between the city's uniqueness and the quality of its visual aesthetics [33]. Additionally, Lynch employed the concept of singularity to elucidate the utilisation of 'landmarks' as visual features that aid in representing the city's identity by isolating a specific element from a range of potential options. The primary characteristic of this category pertains to a singularity, referring to distinctive or noteworthy elements within the given context. Subsequently, the phrase transitioned into the realm of architecture and became prevalent in the field of urban planning. In Eisenman's introduction, it is stated that Rossi employed the term "singularity of place" to elucidate how architecture imparts shape to a location, wherein the notion of singularity manifests as a feasible social encounter that concurrently incorporates spatial and sociological phenomena [34]. According to AlWaer and Cooper, Rossi identifies many key components that define cities of singularity [35]. These include locus solos, which refer to distinct physical locations inside the city, the collective memory of significant events, a strong sense of historical architectural unity, and the presence of distinctive semantics and symbols. Thus, under this particular framework, a city is distinguished by its historical background, physical structure, urban objects, architectural elements, and urban attributes. Lefebvre employed the concept of "singularity" within the realm of sociology to elucidate the distinctive nature of daily existence in Venice, characterised by its unparalleled urban architectural coherence [36].

However, According to Deleuze, Sennett, and Delanda [37-39], singularity in the realm of philosophy pertains to the divergence and recurrence observed within the tangible constituents of urban environments. These scholars conceptualise singularity as contingent upon the distinctiveness of occurrences, wherein ideal occurrences serve as manifestations of singularity. The notion in question has also been explored within the realm of philosophy, specifically through the concepts of repetition and aggregation.

Abusaada et al., and Beretic' et al., employed the concept of 'singularity' within the context of spatial planning to distinguish between the implementation of various urban paradigms [40, 41]. In a recent study, Abusaada and Elshater have provided a revised definition of the term 'city singularity' [41]. Their aim was to illustrate how the spatial organisation of smart cities contributes to the differentiation and competitiveness of daily life experiences.

In our case, the evolving discourse on Urban Singularity, there lies an intricate confluence between the unique identity of the city and its transformative journey towards an advanced, interconnected organism. The traditional understanding of singularity, rooted in the works of thinkers such as Le Corbusier, Lynch, and Rossi, foregrounds the city's distinctiveness, epitomized by historical context, architectural unity, and semiotic resonance. This perspective paints the city as a locus of individual identity, grounded in collective memory and spatial aesthetics [42].

Simultaneously, another strand of thought emerges, inspired by the philosophical insights of Deleuze, Sennett, and contemporaries, which aligns the concept of singularity with the city's ongoing metamorphosis. Here, singularity is not confined to the static attributes that distinguish a place but extends into a dynamic process whereby the city transcends mere architectural form. It morphs into a sophisticated organism that navigates the temporal continuum of past, present, and future.

This transformative aspect of Urban Singularity brings us to a conceptual apex, a Point Singularity where technology, particularly AI, serves as the linchpin in orchestrating a cohesive urban narrative. The city is no longer a mere physical entity but a vibrant, living being, each part imbued with its own "duree," its own unique language. This uniqueness is not only preserved but elevated in this transformative journey, creating a tapestry of individual narratives that interweave and adapt.

Thus, the uniqueness of the city, its singularity, becomes both its historical identity and its future promise. It's a dialogue between what has been and what could be, mediated by technological advancements that render the city a responsive, adaptive entity. In this paradigm, the built environment, nature, and human consciousness meld in a synergistic dance, each singular in expression yet united in purpose. The Urban Singularity then transcends the dualism of form and function, heritage and innovation, to manifest as an organic, resilient organism, ever-evolving, everadapting, each city a unique yet interconnected expression of the dynamic interplay between space, time, and life itself.

The convergence of these dynamic principles in Urban Singularity heralds a pathway to an authentic organism, one that is distinguished by its unique identity and capacity to bridge both the virtual and the real. As cities evolve and adapt, transcending mere physicality, they begin to function like intricate organisms that breathe, respond, and grow. The traditional singularity of the city, rooted in its historical and architectural identity, begins to synergize with a more nuanced, technologically driven understanding [43].

This merger between the virtual and the real manifests not as a mere confluence of technology and space, but as an authentic, living entity that embodies its own unique singularity.

Every nuance of the city's history, every aspiration for the future, is interwoven into this complex web, allowing for an urban experience that transcends the linear boundaries of time and space. The city thus becomes an authentic organism, its singularity not just a static attribute but a living, breathing essence that seamlessly merges the virtual with the real, the past with the future, the individual with the collective. This authentic urban organism reflects the profound possibilities of a city that acknowledges its unique identity while embracing a transformative journey, a city that is singular in its existence yet universal in its aspiration to forge a harmonious, resilient, and interconnected future.

#### 7. Conclusion

In conclusion, this paper has navigated the

multifaceted realm of the Urban Singularity, a concept that encapsulates the convergence of the city's historical identity, architectural unity, technological innovation, and its trajectory towards an organic, resilient, and interconnected organism. The exploration transcended traditional dualities, merging the tangible with the virtual, the static with the evolving, and the individual with the collective, painting a vivid picture of a city that is both a unique entity and a part of a harmonious global tapestry.

The notion of Urban Singularity presents cities as authentic living beings, with every nuance of history and every aspiration for the future interwoven into a complex web. The integration of cutting-edge technology renders the city a responsive, adaptive entity, bridging the virtual and real in a way that transcends the linear boundaries of time and space. The visionary convergence of space, time, and life in the Urban Singularity heralds a pathway to an authentic urban organism, distinguished by its unique identity and capacity to forge a resilient and interconnected future. It is a future where cities breathe, respond, grow, and embody a singularity that is simultaneously static and ever-evolving.

The exploration of Urban Singularity offers a hypothetical vision of a future where cities become adaptive, resilient organisms that not only acknowledge their unique identity but also embrace a transformative journey. It renders a future where cities are not confined by boundaries but are interconnected in a cosmic interlace.

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