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Evolving AI Communities in the Era of Postmodernity: Dilemmas, Perils, and Prospects

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Abstract

The significance of studying artificial intelligence within our contemporary society holds immense importance as the world has embraced an era of novel innovations. The objective of this investigation is to conceptualize the advancement of an artificial intelligence-centered society within the framework of risks and challenges characteristic of postmodernity, while also exploring its potential integration across all facets of human existence. The study encompasses three key objectives:

1. Exploring the evolution of artificial intelligence through its four distinct waves, as it progressively becomes more intricate and exerts an impact on human life.
2. Investigating the developmental trajectories of artificial intelligence (AI) within the context of the growth of smart societies and smart technologies.
3. Developing the conceptualization of artificial intelligence within the dynamic landscape of technological shifts and the digital economy.

Upon analysis, it becomes evident that the progression of an artificial intelligence-based society within the realm of the digital economy is in a state of perpetual evolution, leading to enhancements and the emergence of novel challenges, issues, and risks. The article presents a comprehensive exploration of the development of an artificial intelligence-driven society through its successive "four waves," each characterized by increasing complexity and influence on human

existence. The pathways of artificial intelligence development within the domain of smart societies and smart technologies are thoroughly examined.

It becomes apparent that artificial intelligence has the capacity to fulfill various functions, including learning, comprehension, reasoning, and interaction. Its applications extend across diverse domains including: (a) data security, (b) fraud detection in financial contexts, (c) diagnosis of human ailments in machines, and (d) anticipation of potential diseases based on markers, as well as personalized marketing strategies designed to gather insights about customers. In essence, our interconnected and susceptible society confronts a multitude of risks, predicaments, and challenges. Therefore, safeguarding ourselves becomes imperative, necessitating a triumph in the contest for the ethical implications of technology. This victory in the realm of technological morality is an imperative measure to withstand the trials of progress.

Keywords
artificial intelligence society, data protection, security, smart society, smart technology

Introduction

The research topic's significance lies in the imperative need for caution in dealing with artificial intelligence, given its potential to be more perilous than nuclear weapons. Contemporary "robots" possess the capacity to interface with a wide spectrum of programs, monitor alterations, and even adhere to predetermined schedules (Andriukaitiene et al., 2017).

A socio-philosophical analysis of the evolution of an artificial intelligence-driven society underscores the reality that we inhabit an interconnected and fragile societal landscape rife with risks, predicaments, and challenges. Consequently, it is imperative that we take measures to ensure our protection and emerge victorious in the endeavor to shape the ethical essence of technology, thereby withstanding the challenges posed by the journey of progress. The issue being examined mirrors the broader discourse in interdisciplinary research (Abràmoff et al., 2020; Cohen et al., 2020; Feijóo et al., 2020; Rodrigues, 2020; Wakunuma et al., 2020). The analysis indicates that threats within the realm of artificial intelligence society, such as hacking, virus proliferation, intellectual property infringement, industrial espionage, spam dissemination, identity theft, and DDoS attacks, have been automated. The pervasive presence of extensive computer botnets, exemplified by entities like "Mariposa" and "Conficker," possesses the capability to infiltrate an individual's computing environment, rendering it a subservient automaton for participating in DDoS attacks. Indeed, the transformation wrought by the artificial intelligence society is reshaping the global landscape, with pioneering Chinese enterprises spearheading this paradigm shift. Among the positive aspects worth highlighting is FlyTek, a company engaged in artificial intelligence advancements, particularly in the realms of language recognition, translation, and linguistic synthesis.

The research's overarching objective is to encapsulate the maturation of an artificial intelligence-centric society within the context of the challenges and uncertainties presented by postmodern philosophy, while concurrently exploring the avenues for augmenting its efficacy and pervasive integration across all dimensions of human existence.

Specific Research Objectives:

1. To scrutinize the evolution of artificial intelligence within the context of its four progressive waves, characterized by increasing complexity and their influence on human life.
2. To investigate the trajectories of artificial intelligence (AI) development within the context of the emergence of smart societies and the advancement of smart technologies.
3. To elaborate on the conceptual framework of artificial intelligence amidst the dynamic landscape of technological evolution and the digital economy.

Research Methodology

The research methodology incorporates various approaches for comprehensively analyzing the development of an artificial intelligence-driven society, some of them are as follows:

1. Poststructuralism: This methodology employs indices and modalities for comprehending the intricate reality of the artificial intelligence landscape. It involves analyzing the technogenic, cultural, and social dimensions of reality through the lens of poststructuralist techniques.
2. System Method: The utilization of the system method facilitates the explication of the artificial intelligence society as a sophisticated organized system. This approach reveals the society's structure and substructures, functioning as integral models of development. The system's characteristics encompass integrity, structuredness, adaptability, interplay with the environment, and uniqueness.
3. Discourse Comprehension of AI: This methodology is rooted in linguistic-textual modeling and involves distinguishing matrix-species within artificial intelligence. It seeks to understand the sign-symbolic essence of artificial intelligence as a complex phenomenon.
4. Causal Correlations: By establishing causal correlations among artificial intelligence phenomena, this method enhances comprehension of the interconnectedness and coherence between the technogenic world and its associated challenges, problems, and risks.

The methodology employed in AI research encompasses various approaches and methods utilized by researchers to explore different facets of the field. Below are key elements of AI research methodology:

- Problem Definition: Research initiates with a precise delineation of the problem or question to be addressed. This could involve developing a new algorithm or enhancing existing ones.
- Formulation of Hypotheses and Objectives: Informed by a literature review, researchers articulate hypotheses or primary research questions. Additionally, they outline the research objectives they aim to accomplish.
- Selection of Research Methods: Identifying the methods for collecting and analyzing data is crucial. In AI research, this may encompass mathematical models, statistical analysis, data experiments, and more, tailored to the specific task.
- Data Collection: When the research involves experimentation or model training, relevant data is gathered. Ensuring the data's representativeness and alignment with study objectives is paramount.
- Implementation and Experimentation: Researchers implement models, algorithms, or systems devised to address the problem. They conduct experiments to validate hypotheses and assess the efficacy of developed solutions.
- Analysis of Results: A systematic analysis of obtained results occurs using statistical methods or alternative approaches. Researchers evaluate how well the results align with hypotheses and if the research objectives are met.
- The field of artificial intelligence research employs various specific methods and approaches, tailored to the specific task at hand.

Below are some common research methods:

1. Machine Learning

- Supervised Learning: Constructs models predicting outputs based on labeled training data.
- Unsupervised Learning: Deals with unlabeled data, including clustering, dimensionality reduction, and associative rules.
- Reinforcement Learning: Focuses on algorithms learning through interaction with the environment to maximize cumulative rewards.

2. Deep Learning, Neural Networks:

Investigates deep neural network architectures for problem-solving across domains like computer vision and natural language processing.

3. Transformers: Utilizes sequence processing methods based on transformer architectures, commonly employed in natural language processing.

4. Natural Language Processing (NLP):

- Word Vectorization Methods (Word Embeddings): Explores representing words as vectors for NLP.
- Question-Answer Systems: Develops systems capable of answering questions in natural language.

5. Evolutionary Algorithms:

- Genetic Algorithms: Studies optimization techniques inspired by natural selection mechanisms.
- Genetic Programming: Applies evolutionary principles to generate computer programs.
- Image Processing: Convolutional Neural Networks (CNNs): Utilizes convolutional layers for visual feature extraction.

6. Transfer Learning: Implements pre-trained models on new tasks to enhance performance.

7. Mechatronics Methods: Explores integrating mechanical and electronic systems for efficient robotic devices.

8. Computer Vision Systems for Robots: Develops visual information processing techniques to enhance robot navigation and environmental perception.

This overview highlights some methods, and research often combines various approaches to address complex challenges. As technology advances, ongoing improvements and emerging methods contribute to the evolving landscape of artificial intelligence research.

Results

I. Study of the Development of Artificial Intelligence Society within the Context of its "Four Waves"

The initial two waves—Internet-based artificial intelligence and business-oriented artificial intelligence—have silently enveloped us, progressively reshaping the digital and financial domains. The inaugural wave of the Artificial Intelligence Society draws sustained attention to internet-based enterprises. This wave is characterized by the replacement of mid-level legal professionals with algorithms, algorithmic stock trading, and disease diagnosis. Presently, the artificial intelligence society is in the process of digitizing the world, mastering facial recognition, comprehending requests, and perceptively observing our surroundings. The promise of this wave resides in its potential to revolutionize our perception and interaction with reality, effectively erasing the demarcations between the digital and physical realms.

The influence of autonomous artificial intelligence on our lives is profound. As self-driving vehicles navigate our streets and autonomous drones take flight above, the shift towards intelligent automation is reshaping our daily existence. Even traditional jobs are undergoing a transformation, as smart technologies penetrate factory settings and redefine roles across the spectrum. The ramifications of these changes are so vast that they will render every facet of our lives unrecognizable. From cultivating organic produce to commuting in self-driving cars, to even the production of fast food, these paradigm shifts are altering the landscape of familiarity.

Each of these evolutionary waves demands distinct types of data, offering both the United States and China an opportunity to assume leadership roles in these dynamic processes. China, with its prowess in Internet AI and perceptual AI, is poised to lead in these spheres and is expected to rapidly bridge the gap with the United States in terms of autonomous AI. Presently, artificial intelligence within the business domain is the sole arena where the U.S. undeniably maintains its leadership. However, this competition will extend beyond the borders of these two nations. AI-based services initially emerged in the markets of the U.S. and China, but their influence is now disseminating worldwide, a phenomenon already widespread in emerging economies.

Industry giants such as Uber, Didi, Alibaba, and Amazon are engaged in fierce competition to capture emerging markets, employing divergent strategies that wield a significant impact on the global economic landscape of the 21st century. As Silicon Valley titans introduce their products to new countries, China's Internet enterprises are taking a different approach, investing in local startups that strive to withstand U.S. pressures (Lee, 2018).

"The First Wave" of Development in Artificial Intelligence Society: Internet-Based Artificial Intelligence. Internet-based artificial intelligence, also known as the "first wave," has arguably ingrained itself in our thoughts and potentially our finances. This initial wave of artificial intelligence began to surge nearly 15 years ago and had solidified by around 2012. It primarily manifests as recommendation algorithms, which acquire knowledge of individual preferences and subsequently propose content tailored to those preferences. The efficacy of these mechanisms hinges on the data they can access, and currently, major internet conglomerates possess the largest reservoirs of digital information globally. However, this data becomes truly valuable to algorithms once it is appropriately "labeled." These labels encompass various facets such as purchase history, expressions of dissatisfaction, recurrent views of web pages or products, or the time spent on specific websites. These labels are employed to further refine algorithms, enabling them to offer pertinent content to consumers.

Another compelling illustration of the prowess of artificial intelligence lies in its capacity to leverage data to amass insights about individuals, subsequently fine-tuning its actions to align with our preferences. This process of optimization contributes to heightened profitability for Internet-based corporations that derive revenue from our online activities, such as Google, Baidu, Alibaba, YouTube, and their counterparts. The assertion that good data signifies abundant data is not coincidental. In the realm of artificial intelligence on the Internet, both Chinese and American companies exhibit comparable strength, and the prospects of leading the field are approximately evenly divided. The economic potential arising from the inaugural wave of artificial intelligence remains predominantly confined to the domains of high technology and the digital realm. This "first wave" of artificial intelligence is based on the behaviors of internet users who, in turn, automatically generate data for analysis (Nikitenko et al., 2019).

"The Second Wave of Artificial Intelligence Society Development": Artificial Intelligence for Business. This represents a significant area of interdisciplinary research interest today (Black & Van Esch, 2020; Di Vaio et al., 2020; Gruetzemacher et al., 2020; Libai et al., 2020; Wagner, 2020). The fundamental premise underlying artificial intelligence for business is that traditional enterprises have been harnessing vast troves of data for decades. For instance, insurance companies not only disburse accident claims but also frequently uncover fraudulent activities. Algorithms capable of amalgamating thousands of discernible and latent attributes through intricate mathematical operations often outperform human experts in various business analytics tasks. These tasks encompass a wide spectrum, ranging from processing extensive stock market data to monitoring credit card utilization and evaluating statistics pertaining to unpaid mortgages. The financial sector, replete with well-structured information and precise metrics for optimization, is fertile ground for such advancements. Chinese industry leaders maintain a perspective that investing in external expertise is not a worthwhile endeavor. The application of artificial intelligence holds significant promise in sectors like medical diagnostics, legal proceedings, banking, insurance, and others that demand meticulous data structuring.

"The Third Wave of Artificial Intelligence Society Development": Artificial Intelligence of Perception. Rather than merely cataloging audio archives as sequences of binary digits, algorithms have evolved to comprehend language and interpret the significance behind phrases like "frequent expenditure." This progression signifies the emergence of artificial intelligence of perception.

The third wave encapsulates the ongoing enhancement of these capabilities, delving even further into all aspects of our existence. The process of digitization will envelop our surroundings through the proliferation of sensors and intelligent devices. These devices will transform

facets of the physical world into digital data, enabling their analysis and optimization through the utilization of deep learning algorithms.

"The Fourth Wave of Artificial Intelligence Society": Autonomous Artificial Intelligence. The fourth wave, autonomous artificial intelligence, represents the pinnacle of all achievements from prior stages. As machines attain the ability to "see and hear" their surroundings, they will be poised to navigate and interact seamlessly within them. This phase marks the convergence of machines' prowess in optimizing based on extensive data with their newfound sensory capabilities. The result of this fusion will empower machines not only to comprehend their environment but also to actively shape it.

Devices driven by autonomous artificial intelligence are orchestrating a revolution in our daily lives. From shopping malls to restaurants, factories to cities, and fire departments to every corner, a profound transformation is underway. Similar to preceding waves of artificial intelligence, this transition unfolds progressively, culminating in the creation of "AI-powered cities." Such cities will feature road surfaces embedded with sensors, traffic lights equipped with computer vision, pedestrian crossings capable of discerning the age of pedestrians. Unquestionably, exceptional expertise in fourth-wave artificial intelligence is pivotal, considering the intricacies of safety and the elevated complexity involved in engineering autonomous vehicles. The pursuit of such advancements necessitates a world-class team of engineers (Nikitenko et al., 2019).

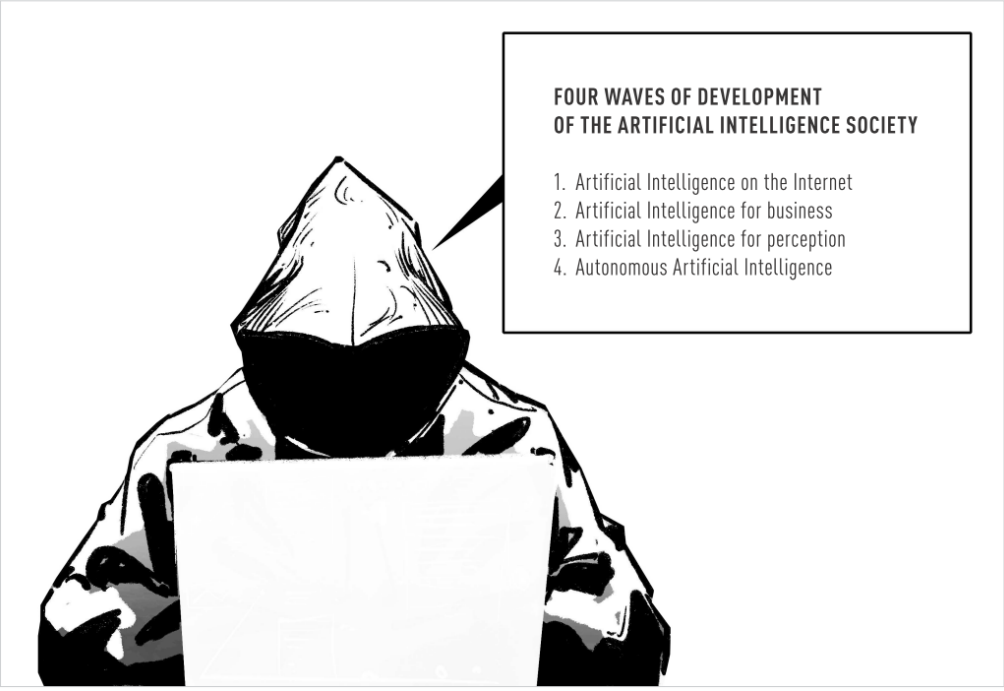

Figure 1. Four Waves of Development of the Artificial Intelligence Society

II. Directions of Artificial Intelligence Society Development in the Context of Smart Society and Smart Technologies

Robots and machines, long present in our world, often adhere to predetermined action algorithms they have been programmed with. The advent of innovations like Apple's Siri, Microsoft's Cortana, and Amazon's Alexa has democratised access to artificial intelligence for ordinary individuals. Among the most vigorous debates today are those surrounding programs that bestow artificial intelligence upon robots, particularly in the context of conceptualizing smart societies and smart technologies (Andriukaitiene et al., 2017, p. 11-12). The scientific and technological discipline dedicated to crafting intelligent machinery and sophisticated software is known as artificial intelligence. Since the inception of computers, the aspiration to create machines with human-like cognitive abilities capable of substituting for professionals across domains has per-

sisted. The appeal of artificial intelligence lies in its capacity to analyze vast datasets - commonly referred to as BIG DATA.

Its applications are extensive: Facebook, equipped with a repository of images and user data, autonomously aids in identifying friends in photos; Google leverages data from myriad translated documents on the web to offer real-time translations in multiple languages. Furthermore, advancements in language recognition have proven to be a significant breakthrough for artificial intelligence. Frequently, artificial intelligence is tailored to execute specific tasks, such as language or facial recognition, online data collection, and operating household appliances. Apple's Siri, for instance, can interpret voice commands, perform medical diagnoses, or even drive vehicles. Artificial intelligence exhibiting human-like cognitive capabilities is deemed strong artificial intelligence. Notably, experts from the McKinsey Global Institute anticipate that, when considering aggregate effects and factoring out competition effects and transition costs, AI could potentially deliver an additional economic output of around $13 trillion by 2030 (*Notes From the AI Frontier: Modeling the Impact of AI on the World Economy*, 2018).

A report by Accenture predicts that global economies will witness growth until 2035, driven by the integration of artificial intelligence (Purdy & Daugherty, 2016). Artificial intelligence becomes an intrinsic facet of product offerings, seamlessly integrated into goods. It finds application in enhancing road safety within vehicles or serving as an integral component of Netflix's recommendation service. Additionally, artificial intelligence streamlines workflows, as evident in the automation of contact centers, which subsequently reduces customer call handling costs.

Another prominent avenue for the application of artificial intelligence is in analytical tasks serving as the foundation for decision-making (Schwab, 2017). The emergence of the notion of a creative persona within the framework of the creative economy, amid the challenges of globalization, underscores the role of all directions in artificial intelligence development in catalyzing business expansion, enhancing customer loyalty, and driving profitability.

The primary trajectory in the development of artificial intelligence society entails real-time data processing, capable of managing extensive datasets while discerning similarities and differences within them. In the realm of medicine, this translates to early-stage diagnostics, while in the financial sector, it is instrumental in combating fraud linked to payment cards and financial transactions. These capabilities also hold potential for enhancing security monitoring and facilitating climate change mitigation efforts.

The second trajectory of artificial intelligence society advancement revolves around its capacity to swiftly generate countless scenarios and templates, subsequently testing ideas using Big Data. This dynamic aids in the discovery of solutions to intricate problems by evaluating their viability through experimentation.

The third trajectory of artificial intelligence society development is dedicated to empowering merchants to tailor personalized offers to their customers, leveraging capabilities akin to those exhibited by platforms such as Netflix. This dimension also facilitates the testing of product names to ascertain customer perception and resonance.

The fourth trajectory of artificial intelligence society development encompasses the ability to process diverse formats, including images, videos, music files, and similar media. This versatility generates an expansive corpus for analysis. As a consequence, contemporary applications such as voice recognition and event scheduling on mobile phones, or lawyers gaining access to data from analogous legal cases, can now thrive. Artificial intelligence's potential extends further, enabling interaction with the environment by collecting data from disparate systems and sensors, facilitating navigation, and fostering collaboration with machinery.

In its multifaceted evolution, the development of an artificial intelligence society embarks on several functions:

1. Learning.
2. Understanding.
3. Reasoning.
4. Interaction.

The progression of artificial intelligence society finds application in various domains:

1. Data protection and security.
2. Detection of financial fraud.
3. Diagnosis of human diseases by machines and anticipation based on markers of disease probability.
4. Personalized marketing, leveraging it to extract customer insights.
5. Language recognition as a cornerstone of customer service in contact centers.
6. The integration of artificial intelligence into the Internet by 2025 to learn and enhance human habits for increased comfort.

Simultaneously, it is vital to acknowledge that the advent of super-intelligent artificial intelligence brings with it a host of risks and uncertainties. Notably, computer luminaries have raised concerns about the potential threats posed by artificial intelligence, given that humanity has never before confronted the challenge of creating super-intelligent entities. Predicting the outcomes of such a scenario is exceedingly complex. Presently, artificial intelligence is already contributing to 30 corporate audits, with 75% of respondents anticipating a significant turning point in this realm by 2025.

Artificial intelligence has demonstrated its capacity to proficiently manage typical solutions and automate processes, rendering it invaluable for numerous tasks within large organizations and industries. The trend is pointing towards an environment where artificial intelligence will progressively replace humans in various tasks, a prediction highlighted by Klaus Schwab (2017). This evolution foresees the computerization of approximately 47 percent of jobs that existed in the U.S. in 2010 within the coming 10-20 years (Sandhana, 2015). Despite these changes, positive outcomes have emerged, including:

1. Cost reductions.
2. Heightened productivity.
3. The dismantling of barriers to innovation.
4. New avenues for small businesses to flourish.

Yet, a potential transformation looms on the horizon - an explosion of intelligence surpassing human capabilities, termed the "singularity," a concept pioneered by Raymond Kurzweil (2005). Elaborating on this, Elon Musk underscores the profound threat posed by artificial intelligence and suggests that risks can be mitigated through the application of artificial intelligence control and security measures (Clifford, 2018). If Moore's Law persists, projecting developments at the same pace as over the past three decades, computer processors could reach the processing speed of the human brain by 2025.

In the realm of robotics, the International Federation of Robotics notes the existence of 1.1 million robots globally, with 80% of automobile manufacturing workflows powered by robotic systems (Britchenko & Polishchuk, 2018). These machines have the potential to streamline supply chains for improved business predictability and efficiency. A significant tipping point is anticipated by 2025, as 86% of respondents projecting.

Positive Outcomes of this Process:

1. Streamlined supply chains and logistics.
2. Enhanced free time.
3. Improved treatment outcomes.
4. Heightened access to materials.
5. Reshoring - the substitution of foreign labor with robots.

In the context of robotization and artificial intelligence, there is a general willingness to acknowledge that computer programs have the capacity to defeat human experts in games like checkers or chess, and computers excel in performing complex calculations with greater efficiency than humans. Simultaneously, there is a prevailing belief that artificial intelligence possesses ethical boundaries. The ongoing progression of technological capabilities suggests that we are approaching a time when the manipulation of two fundamental types of information–biologi-

cal and computational, represented by the byte and the genome–could potentially result in the emergence of advanced entities. This impending prospect underscores the necessity for humanity, collectively sensing the potential risks and complexities posed by artificial intelligence, to actively engage in a discourse. This discourse should encompass the realm of possibilities and challenges associated with the trajectory that artificial intelligence might follow.

The emerging technologies of today–robotics, artificial intelligence, synthetic biology, nanotechnology, and 3D manufacturing–are also shaping the trajectory of the global landscape and giving rise to numerous potential threats. These technological advancements signify a new reality and an existential transformation of all aspects of modern socio-thought. This evolution introduces fresh challenges and risks for humanity, necessitating the formulation of novel paradigms, theories, and models to address the survival issues faced by individuals and society.

III. Development of the Concept of Evolution Society of Artificial Intelligence (AI) 3.0 in the Face of Technological Change and Digital Revolution

Disruptive changes reverberate across various domains, triggering global implications that encompass employment, privacy, and even the very definition of "humanity" in the future. Thus, science and technology must be anchored more firmly to ethical boundaries. In response, the artificial intelligence community must establish institutions capable of continuous assessment of the broader ramifications stemming from comprehensive technological progress. This pertains particularly to the emergence of new artificial intelligence developments capable of achieving, or even surpassing, human intelligence across diverse domains and challenges.

The evolution of the artificial intelligence (AI) concept within the context of the digital economy is an ongoing and progressively refining process. Despite advancements, AI's cognitive capacities still fall notably short of human capabilities across numerous domains, notably in areas such as social skills; efforts have been made by humans to educate Artificial Intelligence in the art of programming systems flawlessly. This approach has gained traction among scientists due to their faith in the concept of an imminent intellectual explosion, a concept initially introduced by British mathematician Irving Goode in 1965 (Andriukaitiene et al., 2017).

Artificial intelligence denotes an immensely intelligent machine capable of exceeding the entirety of cognitive prowess possessed by even the most astute human. Given that the construction of machines is intrinsic to cognitive processes, this superintelligent machine could engender the creation of even more advanced machines. Consequently, an "intellectual explosion" is anticipated, leading to a considerable advancement that outpaces the human intellect by a substantial margin. Developers who have accomplished this recursive perfection believe that the machine's intelligence will soon elevate to a level where it can autonomously acquire and excel in all other human skills deemed relevant.

The concept of life encompasses a process capable of storing intricate forms and replicating itself, characterized by three developmental stages:

1. The biological phase (1.0), in which it evolves both its physical framework (body) and its "software" (intelligence).
2. The cultural phase (2.0), where it possesses the capacity to develop its own "software" through learning.
3. The technological phase (3.0), enabling the creation of "hardware" and the assertion of control over its own fate. The advent of Artificial Intelligence might even enable the commencement of Life 3.0 within this century.

In grappling with this intricate matter, three primary perspectives have emerged:

1. Technoskeptics contend that the creation of superhuman artificial intelligence is such a formidable task that its realization might remain elusive for hundreds of years, thus rendering immediate concern unnecessary (Life 3.0).
2. Digital utopians predict that the emergence of such intelligence could transpire as early as this century and enthusiastically embrace "Life 3.0" as a natural and desirable pro-

gression in the cosmic evolution.

3. The movement advocating for the development of enabling artificial intelligence, characterized by its ability to achieve intricate objectives, deems its attainment plausible within this century. However, they acknowledge that favorable outcomes are not guaranteed and advocate for persistent efforts focused on ensuring the safety of artificial intelligence.

Amidst these discussions, certain challenges arise from misunderstandings, leading to pseudo-contradictions. Engaging in debates over terms such as "life," "intelligence," and "consciousness" can be futile if opposing parties attribute divergent meanings to these terms or propagate misconceptions (Cherep et al., 2020).

Central to the progression of the artificial intelligence society is the fundamental concept of "intelligence," characterized by the ability to accomplish intricate objectives through a spectrum of skills geared toward achieving AI-driven goals. Current artificial intelligence tends to be specialized, with individual systems designed to achieve very specific objectives, in stark contrast to the wide-ranging capabilities of human intelligence. If the ongoing advancement in the AI sector persists, the eventual attainment of human-level proficiency across all skills by artificial intelligence will present captivating opportunities and intricate challenges across industries spanning bug detection, weapon regulations, and job security (Lee, 2018).

Discussion

In the foreseeable future, the trajectory of AI progress holds the potential to significantly enhance human existence, manifesting in multifarious ways. This ranges from enhancing the efficiency of personal lives, electrical grids, and financial markets, to the implementation of autonomous driving for lifesaving purposes, and the utilization of surgical robots and AI-based diagnostic systems (Nikitenko et al., 2019). To enable artificial intelligence to effectively govern real-world systems, a vital prerequisite is bolstering its robustness to ensure precise alignment with human expectations and to prevent harm. This entails addressing demanding technical issues encompassing verification, validation, security, and control.

Certainly, in the near future, advancements in Artificial Intelligence (AI) have immense potential to significantly enhance human existence. Key areas where AI can play a pivotal role include:

1. Medical Research and Healthcare: AI applications in medical research, diagnosis, and treatment can enhance diagnostic accuracy, personalize treatment plans, and increase the efficiency of medical practices.
2. Education: AI in educational technology can create personalized learning programs, analyze individual student needs, and foster more effective learning experiences.
3. Energy Management: Optimizing energy systems, predicting energy production, and developing efficient renewable energy practices can be enhanced using AI.
4. Transportation: AI contributes to autonomous vehicles, traffic optimization, improved navigation, and safety systems, making substantial advancements in the field of transportation.
5. Environmental Protection: AI aids in climate modeling, ecosystem monitoring, and natural disaster prevention, facilitating effective environmental management.
6. Business Optimization: AI can optimize business processes, forecast market trends, and automate production, improving enterprise efficiency and fostering development opportunities.
7. Communication: Enhanced machine translation systems, chatbots, and voice interfaces can make cross-language communication more convenient and efficient.

Despite these positive aspects, challenges such as ethical considerations, data security, and issues of transparency and accountability in AI development and application must be addressed.

It is crucial to develop and implement AI technologies with a focus on these aspects to maximize their potential for the benefit of humanity.

Discussions in the field of Artificial Intelligence (AI) encompass numerous concepts, theories, and contributions from various authors. Key figures and their associated concepts include:

1. Arthur Samuel (2000): Introduced the term machine learning and developed ideas on machine learning using data.
2. Tom Mitchell (1983): Defined machine learning as a field allowing computers to learn without explicit programming.
3. Andrew Ng (2016): Machine learning expert and co-founder of the Coursera platform, contributed to the development of deep learning.
4. Yann LeCun: Developer of deep learning algorithms, known for work in pattern recognition and neural networks (Farabet et al., 2013; LeCun et al., 2015).
5. Juergen Schmidhuber (1992, 2013): Contributed to the development of neural network architectures and recurrent neural networks.
6. Alan Turing (1950): Pioneer in the theory of computation, formulated the Turing test to determine machine intelligence.
7. John McCarthy (1986): One of the founders of AI research, developed the Lisp programming language.
8. McCulloch and Pitts (1943): Proposed the artificial neuron model, the basis for neural networks.
9. Sutton and Barto (1998): Authors of "Introduction to Reinforcement Learning," making important contributions to reinforcement learning concepts.
10. Norvig and Russell (2011): Authors of "Artificial Intelligence: A Modern Approach," addressing NLP principles and AI aspects.
11. Yoshua Bengio, Yann LeCun, and Geoffrey Hinton: Made significant contributions to deep learning techniques, particularly in the context of NLP (LeCun et al., 2015).
12. Timnit Gebru: AI ethics researcher, known for uncovering ethical and social issues in AI (Jo & Gebru, 2020).
13. Rodney Brooks(2013): Co-founder of iRobot, a developer in robotics and AI research.
14. Hans Moravec (1999): Contributed to mobile robotics and the development of autonomous robots.

Each of these figures has left a lasting impact on different facets and directions within the field of artificial intelligence. Their collective work forms the foundation for numerous innovations and applications in this rapidly evolving field.

This imperative for heightened reliability becomes especially pronounced in the context of AI-powered weaponry, where the risks can be substantial, necessitating international agreements to avert unbridled arms proliferation. Opportunities also exist to enhance the fairness and efficiency of the legal system by creating transparent and unbiased AI judges. As our legal framework adapts to the rapid evolution of artificial intelligence, posing intricate legal queries about privacy, liability, and regulation, the integration of intelligent machines can increasingly contribute to the labor market.

The prospect of creating cyborgs appears plausible and holds the potential to pave the way toward achieving highly advanced machine intelligence. The phenomenon of an intelligence explosion signifies a rapid surge in technology, culminating in a stable state governed solely by the laws of physics. This technological pinnacle surpasses the current scope of technological advancements, enabling the generation of energy at a scale almost 10 billion times greater from a given mass (utilizing sphalerons or black holes), the storage of information by 12-18 orders of magnitude more in the same mass, a computation speed boost of 31-41 orders of magnitude, or the transformation of matter into desired forms. Within the realms of space, information is poised to emerge as the primary commodity for exchange or trade. Interactions between two expanding civilizations can lead to assimilation, cooperation, or war. It is quite possible that life

is the only form of existence capable of animating the observable universe in the future.

If we continually advance technology with due care, foresight, and strategic planning to circumvent failures, the possibility exists for life to flourish on Earth and extend far beyond for billions of years, exceeding the imagination of our forebears. The construction of increasingly sophisticated machines is driven by the pursuit of our objectives. By creating machines that exhibit goal-oriented behavior, the objective is to align machine goals with human aspirations.

The potential of artificial intelligence holds the promise of a remarkable future, contingent on addressing some of the most challenging inquiries. In the words of Nick Bostrom (2014), we are presently safeguarding our future and the continuation of life by steering the trajectory of artificial intelligence toward a more promising future for humanity. The preference lies in fostering a society where the outcomes of scientific research are harnessed for the betterment of people rather than ignored.

The evolution of concept of Artificial Intelligence 3.0 within the context of technological shifts and the digital economy is becoming a mounting concern, given our escalating reliance on it that renders us susceptible, while contemporary intricate systems continuously burgeon (Schwab, 2017).

The advancement of the artificial intelligence society has linked a multitude of new devices to the Internet, thoroughly saturating various facets of our daily existence. This ongoing connectivity will interlink individuals and machines across the globe, interweaving them into our shared consciousness, which is also burgeoning at an exponential rate. The technological "cornucopia" that we embrace into our lives without contemplation and thoughtful evaluation could rebound and introduce a range of problems, complexities, and inconsistencies. These dangers foreshadow the advent of a novel reality, a forthcoming era for which we are not yet adequately prepared.

Through recognizing and acknowledging the perils posed by artificial intelligence technologies to humanity, it is imperative to initiate the requisite changes that will bolster the foundation of our technological future. There arises a necessity for enhanced governmental oversight of cybercrime, which is witnessing a surge in activity across networks; companies must elevate security standards and ensure robust cybersecurity measures. Irrespective of the sophistication of technology or Internet services, participants in the digital underground stand ready to employ innovative tools at their disposal, often motivated by financial gains through calculated large-scale thefts. This defiance challenges authorities and disregards regulations and laws, as they devise malicious software and instigate innovative cyber scams, thereby generating new domains of criminal enterprises. Hence, it is incumbent upon the state to preempt hacker assaults, thereby safeguarding against cybercrime.

The state ought to formulate a spectrum of technical, technological, organizational, and educational guidelines encompassing public policy, aimed at mitigating the risks associated with technology. It should also utilize various strategies and tools to maximize benefits while minimizing adverse consequences. In facing the crucible of progress, humanity must prevail. In the contemporary landscape of society and economy, trust within the digital realm holds immense significance. With the escalating threats, daily data breaches orchestrated by hackers, and the state's limitations in safeguarding individuals, and businesses lacking adequate technical resources for defense, the need for heightened governmental vigilance in protecting society and individuals against cybercrime is imperative. This entails elevating security standards, strengthening cybersecurity measures, and preventing assaults on critical state infrastructure.

In light of the evolving artificial intelligence society, the state should devise a robust national security strategy and bolster control mechanisms to thwart cybercriminal attacks. In anticipation of potential future conflicts, the establishment of a cyber army and cyber police holds merit (Lee, 2018). Vital components like cyber security, biometrics, digital identification, platforms, and cloud technologies play pivotal roles in augmenting the efficiency of artificial intelligence. The convergence of information and computer technologies ought to serve as a groundbreaking force that propels the development of artificial intelligence. As highlighted by Oleg Maltsev, the

relentless surge of technological advancement is progressively engulfing the physical realm in the digital domain. This paradigm shift necessitates novel security approaches in consonance with the exigencies and parameters of the 21st century (Huzhva, 2020).

Conclusions

1. The evolution of the artificial intelligence society within the postmodern context, while acknowledging its issues, risks, and challenges, underscores the dissolution of boundaries between the online and offline worlds. This dissolution is occurring at an accelerated pace, increasing the touchpoints through which our interaction with the Internet takes place. Novel hybrid environments are emerging, characterized by the integration of online and offline realms. This convergence from pure e-commerce to online-to-offline service provision signifies the next phase in artificial intelligence evolution, underscored by comprehensive integration. In the foreseeable future, the artificial intelligence society will revolutionize shopping centers, grocery stores, urban streets, and homes into online-to-offline convergent spaces. Innovative additions arising from this transformation will enable everyday users to experience scenarios akin to those in science fiction films, such as cashless payment at restaurants through facial recognition technology, eliminating the need for cash, cards, or mobile phones.

2. As perceptual artificial intelligence continues to advance, gaining proficiency in recognizing faces, comprehending language, and perceiving the world, it creates a multitude of new intersections between the online and offline realms, propelling the evolution of the artificial intelligence society. The emerging challenges are expanding in complexity, revolving around safeguarding and maintaining control over the myriad devices integrated into our daily lives. Presently, a lack of robust models for genuinely secure and reliable computing persists.

3. The progression of the Artificial Intelligence Society mandates a strategic trajectory to navigate the array of technological threats confronting humanity today. Through a global mobilization of the artificial intelligence society and the reclamation of comprehensive control over our devices and technologies, we can harness these tools solely for the advancement of human welfare. The establishment of secure and dependable computing is paramount for the foundation of our technological future, to avert potential system collapse.

4. The development of the artificial intelligence society within the context of postmodernity, acknowledging challenges, risks, and problems, underscores the imperative to concurrently address national interests, legal frameworks, ethical considerations, and societal repercussions inherent in the technological advancements we have fostered. We bear a moral obligation for the growth of the artificial intelligence society and the consequences of our innovations. The responsibility for safeguarding the essence of technology rests upon us, urging us to triumph in the battle to preserve this essence and to endure the trials of progress, thus catalyzing a resolute call to action.

When incorporating artificial intelligence into practice, several crucial aspects should be considered. Here are practical recommendations:

1. Identify specific tasks: Clearly define tasks that artificial intelligence should address, such as automating routines, optimizing business processes, or enhancing decision-making.
2. Collect quality data: Data quality significantly impacts AI system performance. Ensure an ample amount of clean and relevant data.
3. Choose the appropriate machine learning algorithm or method: Select the method that best fits the problem, considering, for example, convolutional neural networks for image processing and NLP methods for text processing.
4. Train the model on diverse data: Use varied data during training to enhance the model's generalizability and its ability to handle new data effectively.
5. Regularly train the model: Depending on task changes and data variations, conduct regular training sessions to maintain the model's relevance and effectiveness.

6. Ensure interpretability: Design AI systems with attention to model interpretability, crucial for understanding decision-making processes, particularly when impacting individuals.
7. Address ethical considerations: Consider ethical issues in AI development and application, ensuring transparency, respecting data privacy, and preventing potential negative consequences.
8. Periodically test and validate: Regularly test and validate the AI system on new data to identify potential issues and maintain reliability.
9. Utilize user feedback: Adjust the model based on user feedback to enhance the system over time.
10. Train and update staff: Provide training on effective system use and interaction. Install monitoring systems for tracking performance and results, ensuring regular updates and optimization.
11. Automate and optimize processes: Streamline business processes and reduce staff workload through the automation and optimization of routine tasks.
12. Collaborate and share knowledge: Engage in collaboration and knowledge sharing within the AI community and industry.
13. Scalability readiness: Design AI systems with scalability in mind to handle increasing data volumes and tasks efficiently.
14. Assess potential risks: Evaluate data security, ethical considerations, and potential negative consequences associated with AI use.
15. Explore emerging trends: Stay informed about new trends, technologies, methods, and approaches in AI to enhance your system.
16. Readiness to adapt: Be prepared to change and adapt your system to new requirements and technologies.
17. Investigate societal impact: When designing and implementing AI systems, consider their impact on society and societal values, evaluating potential social and ethical implications.

Following these practical recommendations facilitates successful integration and utilization of artificial intelligence in various fields and activities, contributing to more effective implementations in practice.

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