Journal of Energy and Power Engineering 18 (2024) 146-154
doi: 10.17265/1934-8975/2024.04.003

ChatGPT and beyond the Next Generation of AI Evolution (A Communication)

Farhang Mossavar-Rahmani[1] and Bahman Zohuri[2]

1. Finance School of Business Technology and Engineering National University, San Diego 92110, California, USA

2. Ageno School of Business, Golden Gate University, San Francisco 94105, California, USA

Abstract: Systems like ChatGPT are at the forefront of the revolutionary evolution of AI (artificial intelligence), demonstrating the potential for dynamic interaction and natural language understanding. To understand how ChatGPT and related technologies will go from supervised learning models to semi-supervised and, eventually, unsupervised systems, this essay examines the future paradigm of AI. By forecasting advancements in technological progression, human-centric integration, and autonomy, a roadmap emerges for the next generation of AI. The progression highlights enhanced conversational capabilities, hybrid AI systems for domain-specific expertise, and fully autonomous AGI (general AI) capable of independent learning and innovation. Emphasis is placed on aligning AI with ethical principles, personalization, and interdisciplinary applications to foster human-AI collaboration.

Key words: ChatGPT, AI, next-generation AI, supervised learning, semi-supervised learning, unsupervised learning, autonomy, human-centric integration, AI evolution, AGI.

1. Introduction

Over the past ten years, AI (artificial intelligence) has transformed from a fledgling idea into a powerful force that is changing everyday life and whole sectors. The emergence of conversational AI such as ChatGPT is one of the most noteworthy developments. This advanced tool facilitates human-like communication and helps solve challenging issues in a variety of fields. However, as we stand on the brink of the next wave of AI evolution, one question looms: Is ChatGPT the future of AI known as Generative AI, or is the next generation of AI destined to surpass it entirely? [1-4].

In addition, a new era of human-machine cooperation is being ushered in by the quick development of AI, which is changing industries and human-technology interaction. At the forefront of this change is ChatGPT, a conversational AI that has captured users' attention with its ability to understand and generate human-like language. ChatGPT has shown itself to be a versatile tool with a wide range of applications, from assisting with routine tasks to encouraging innovation and addressing difficult problems. Whether ChatGPT represents the pinnacle of AI advancement or is only a forerunner to something even more complex still exists despite its revolutionary nature [3-5].

By examining the current capabilities of ChatGPT, its limitations, and the emerging trends in AI technology, we aim to understand how conversational AI fits into the broader vision of next-generation systems. Will ChatGPT remain a cornerstone of AI innovation, or will it be eclipsed by more sophisticated models capable of revolutionizing how humans interact with machines? The answer lies in a symbiotic evolution where advancements build on one another, paving the way for AI to become an even more integral part of our future [6-8].

2. The Role of ChatGPT in Today's AI Landscape

ChatGPT represents a significant leap in NLP (natural language processing), blending vast linguistic knowledge

Corresponding author: Bahman Zohuri, Ph.D., adjunct professor, research fields: artificial intelligence and machine learning.

with context-aware responses. Its applications range from personal assistance and education to content creation and even therapeutic communication. As businesses and individuals increasingly embrace ChatGPT, its transformative potential becomes evident [5].

However, ChatGPT's success also highlights the limitations of current AI systems. While remarkably adept at language, it lacks deeper reasoning, emotional intelligence, and domain-specific expertise unless explicitly fine-tuned. This opens the door for innovation to build on ChatGPT's foundation [6].

3. Enhancing ChatGPT for the Future

Rather than viewing ChatGPT as a terminal point, it can be a steppingstone for more advanced AI. Several key areas for enhancement include the following [9, 10].

3.1 Contextual Memory and Personalization

Future iterations could integrate long-term memory, enabling more personalized interactions over time. In other words, to provide more human-like conversation, with less errors. For example, a ChatGPT-like system could recall past conversations and adapt responses based on user preferences [11, 12].

3.2 Multimodal Capabilities

Combining text, voice, and visual input processing could allow AI to interpret and respond in more affluent, human-like ways. It can be done by making it possible for ChatGPT to learn and grow, accessing and processing information from even larger datasets. Imagine an AI that answers questions, reads facial expressions, or analyzes real-time visual data.

3.3 Ethical and Transparent AI

Enhancements could focus on building trust through XAI (explainable AI), ensuring users understand how decisions are made while embedding robust ethical guidelines to prevent misuse, also, defining more clearly the ethical issues surrounding AI development.

3.4 Specialized Domain Expertise

ChatGPT could evolve into a more reliable expert system for sectors like medicine, law, tutoring, automated essay grading, and engineering by integrating domain-specific AI modules.

In summary, enhancing ChatGPT for the future involves improving personalization, integrating multimodal capabilities, ensuring ethical transparency, impact on specific industries and incorporating domain-specific expertise to create more adaptive, intelligent, and user-centric systems.

4. Is the Next Generation of AI beyond ChatGPT?

While enhancing ChatGPT could yield immense benefits, the broader AI community is exploring directions that may transcend conversational AI entirely. Emerging technologies like GANs (generative adversarial networks), neuromorphic computing, and quantum AI hint at paradigms far beyond the NLP-centric model [13].

These advancements aim to replicate human-like cognition, adaptive learning, and problem-solving capabilities surpassing current models. For instance, AI systems capable of autonomous discovery in scientific research or seamless collaboration with humans in creative industries could redefine what we understand as "intelligent", preventing misuse and spread of misinformation.

5. The Interplay between Generations

Future AI and ChatGPT are not rivals; instead, we should see them as related stages of evolution. AI encompasses various technologies and approaches that enable machines to mimic human intelligence. Think of it as the entire family tree, and ChatGPT can serve as a link, promoting the use of AI and influencing the next generation's design. Similar to this, conversational AI can benefit from insights from more sophisticated AI systems, resulting in an ongoing innovation feedback loop.

6. Challenges on the Horizon

The approach will be fraught with difficulties. Technologists, legislators, and ethicists must collaborate to guarantee equitable access to cutting-edge AI, avoid prejudices, and preserve transparency. Furthermore, addressing societal concerns about misuse and obsolescence will be essential as AI becomes more powerful.

7. The Evolution of AI: From Supervised Learning to True Autonomy

The movement from supervised to semi-supervised to unsupervised AI may be seen as an organic and forward-thinking path in the development of AI. The shift from supervised to unsupervised learning is a key step towards more robust and independent AI. Unsupervised AI is given only input data and must find structure and relationships within it independently.

The driving force behind this progress is the demand for more autonomous, adaptive, and intelligent systems that can function in situations that are becoming increasingly complicated with minimal interference from humans. The following is an explanation of how this progression is developing, as well as how tools such as ChatGPT play a part in maintaining a holistic perspective.

7.1 From Supervised AI to Semi-supervised AI

Supervised AI relies heavily on labeled data humans provide to learn patterns and make predictions. While consequential, this approach is limited by the time and resources required to curate and label large datasets. As AI systems like ChatGPT mature, there is a push toward semi-supervised learning, which blends a small amount of labeled data with vast amounts of unlabeled data. This more scalable approach reflects how humans learn by combining structured guidance with self-driven exploration [13].

ChatGPT's underlying architecture, which benefits from large-scale pretraining on unlabeled data followed by fine-tuning with labeled examples, is a step in this direction. It showcases how semi-supervised techniques can achieve significant advances in language understanding and generation.

7.2 The Leap to Unsupervised AI

Unsupervised AI achieves the highest level of autonomy, in which systems can identify structures, relationships, and patterns in data without the need for labeled samples. This type of learning is in line with the ultimate objective of developing highly intelligent systems with the capacity for autonomous reasoning, creativity, and decision-making.

The shift to unsupervised learning is essential for jobs in dynamic and unstructured contexts, where labeled data may be limited or nonexistent. For instance, unsupervised AI systems may perform better than supervised ones in domains like anomaly detection, scientific discovery, or open-ended problem solving by uncovering hidden insights that people might not notice.

7.3 ChatGPT's Role in This Evolution

While ChatGPT is primarily a product of semi-supervised techniques, its design and applications contribute to the broader shift toward autonomy.

- Dynamic Learning: Future iterations could incorporate mechanisms for real-time learning, allowing the system to refine its knowledge base without explicit supervision.
- Adaptability: By integrating unsupervised modules, conversational AI systems could better adapt to new domains and languages without requiring extensive retraining.
- Foundation for AGI (Artificial General Intelligence): The development of non-supervised AI is seen as a critical step toward AGI—AI that can reason and learn in a manner similar to human intelligence.

On the other hand, we may express that ChatGPT serves as a foundational step in AI's evolution, demonstrating the potential of conversational systems while paving the way for more autonomous, adaptive, and innovative next-generation AI technologies.

7.4 Landing on Non-supervised AI: The End Goal?

The transition to unsupervised AI does not mean that supervised or semi-supervised methods will no longer be used. Instead, a hybrid strategy that combines these approaches will probably be used. Supervised and semi-supervised techniques may supply initial scaffolding, while unsupervised systems assume progressively more independent roles.

The shift from supervised to unsupervised AI is about giving AI systems the freedom to think, learn, and create independently—not only about minimizing human involvement. Humans' desire to create machines capable of more than just performing predetermined duties and significantly contributing to resolving the planet's most challenging problems is reflected in this developmental path. A significant contribution to the resolution of the planet's most challenging problems is reflected in this developmental path.

8. A Model to Forecast the Future Paradigm of ChatGPT and beyond

The progression of ChatGPT (AI generative four) and the overall development of AI can be represented through a framework that integrates technological innovations, societal demands, and developing research orientations. This approach emphasizes three fundamental dimensions: Technological Advancement, Human-Centric Integration, and Autonomy and Adaptability. Collectively, these variables create a predictive framework for envisioning the future of AI [2, 9, 12].

8.1 Technological Progression: The Layered Evolution of AI

This dimension reflects the gradual advancement of AI capabilities through iterations of ChatGPT and similar systems. It encompasses three key stages.

8.1.1 Enhanced Conversational AI (Near-Term)

• Focus: Improving contextual understanding, response accuracy, and personalization.

• Features: Integration of multimodal capabilities (text, audio, and visual), dynamic memory for personalized interactions, and ethical AI frameworks for transparency and bias mitigation.

• Forecast: Widespread adoption in sectors like education, healthcare, customer support, and creative industries.

8.1.2 Hybrid AI Systems (Mid-Term)

• Focus: Combining conversational AI with specialized AI modules for domain-specific expertise.

• Features: Collaborative intelligence where ChatGPT-like systems integrate with robotics, IoT (Internet of Things) devices, and autonomous decision-making platforms.

• Forecast: Deployment in complex environments like smart cities, advanced research labs, and crisis management systems.

8.1.3 Autonomous AGI (general AI) (Long-Term)

• Focus: Transition to AI systems capable of independent reasoning, learning, and adaptability across all domains.

• Features: Non-supervised learning, real-time adaptability, and symbiotic human-AI collaboration.

• Forecast: Redefinition of human-machine relationships, with AI acting as partners in innovation and decision-making.

In summary, technological progression in AI reflects a layered evolution from enhanced conversational systems to hybrid domain-specific intelligence and ultimately autonomous AGI capable of independent reasoning.

8.2 Human-Centric Integration: The Sociotechnical Dimension

For AI systems like ChatGPT to evolve, they must align with human values and societal needs. This involves:

• Personalization at Scale: AI that adapts to individual preferences while respecting privacy.

• Ethical AI Governance: Robust frameworks to ensure fairness, accountability, and inclusivity.

• Interdisciplinary Applications: Integration of AI into fields like medicine, law, education, and the arts to amplify human potential.

Furthermore, when we look at the Forecast Model for Human-Centric Integration, we may be able to look at the following time-line assumptions:

- 2025-2030: Focus on personalization and real-time adaptability.
- 2030-2040: Integration with global systems for education, healthcare, and governance.
- 2040 and beyond: Collaborative systems enabling humans and AI to co-create solutions for societal challenges.

From the above point of view perspective, human-centric integration focuses on aligning AI with societal values by prioritizing ethical governance, personalization, and interdisciplinary applications to enhance human-AI collaboration.

8.3 Autonomy and Adaptability: The Intelligence Continuum

The journey from supervised to semi-supervised and ultimately non-supervised AI is critical for the future paradigm of ChatGPT. The model here emphasizes three stages:

- Supervised AI (Present): AI relies on human-curated datasets.
- Semi-supervised AI (Emerging): AI blends structured guidance with independent data exploration.
- Unsupervised AI (Future): AI discovers patterns and relationships autonomously, enabling unparalleled adaptability.

Forecast model for autonomy and adaptability is predictable in the following possible time-line assumptions:

- 2025: Enhanced ChatGPT iterations with limited self-learning capabilities.
- 2030: AI systems integrating with other autonomous technologies like robotics and neuromorphic computing.
- 2040 and beyond: Fully autonomous systems capable of independent innovation and ethical reasoning.

In summary, as part of charting the AI future, the forecast model for ChatGPT and beyond highlights a dynamic progression where technology, societal integration, and autonomy converge. The evolution will not be linear but iterative, with feedback loops driving innovation. ChatGPT represents not just a milestone but a foundation, paving the way for the next generation of intelligent systems. By anticipating these trends, we can prepare for a future where AI is seamlessly integrated into our lives, amplifying human creativity, capability, and understanding.

9. Conclusion

ChatGPT demonstrates how the development of AI signifies a paradigm change in human civilization toward more independent, flexible, and intricately interwoven systems. This article highlights the development of AI from supervised to semi-supervised and ultimately unsupervised, which reflects the increasing complexity of both society's expectations and technology capabilities. Despite being a significant milestone, ChatGPT lays the groundwork for the upcoming generation of intelligent systems that will push the limits of AI.

Future developments will prioritize domain-specific knowledge, human-centric integration, and ethical considerations, allowing AI to collaborate with humans on creativity, innovation, and problem-solving. The prediction paradigm emphasizes a mutually beneficial and cooperative relationship between humans and AI. Ultimately, ChatGPT and its offspring will revolutionize sectors and be essential in solving some of humanity's most challenging problems, opening the door for a time when human creativity and intelligent systems coexist [1].

Furthermore, ChatGPT's development and the more considerable advancement of AI mark a revolutionary change in how machines perceive, communicate, and work alongside people. AI is moving toward more autonomy, adaptability, and intelligence, starting with its roots in supervised learning and moving toward semi-supervised and unsupervised paradigms. A turning point in this development, ChatGPT is a brilliant example of conversational AI's potential,

showcasing its adaptability to various sectors and capacity to stimulate human creativity and problem-solving skills [14-16].

Looking forward, the future paradigm of AI will be shaped by three key dimensions: technological progression, human-centric integration, and the development of autonomous systems. Together, these factors predict a future in which AI systems progress beyond improving dialogue to becoming hybrid collaborators and, ultimately, autonomous general intelligence with the capacity for self-directed learning and creativity. To guarantee AI systems are reliable and inclusive, ethical issues, personalization, and alignment with society's demands will continue to be crucial at every stage.

ChatGPT is not an endpoint but a steppingstone, paving the way for the next generation of AI systems to redefine human-machine relationships. In this symbiotic progression, AI is envisioned as a collaborator in tackling global issues, developing sectors, and nurturing human potential. The shift from supervised to unsupervised intelligence will make possible a future where AI enhances human capacity for innovation, adaptation, and prosperity.

As a synergistic conclusion, we may conclude whether ChatGPT or its successors gain attention will not determine AI's future direction. Rather, it will rely on how well different AI paradigms are integrated, each bringing special advantages. As ChatGPT evolves and collaborates with emerging technologies, it will remain a cornerstone in shaping the next generation of intelligent systems—propelling us into a future where AI is a true partner in human progress.

The question is not whether AI will surpass ChatGPT but how ChatGPT will help pave the way for the next leap forward. Together, they will define the future of AI.

For those who are interest in Python Algorithm of forecasting for this article, please see Appendix 1 at the end of the article.

References

[1] Zohuri, B., and Mossavar-Rahmani, F. 2023. "Artificial General Intelligence (AGI) Unleashing the Power of Artificial General Intelligence: OpenAI's Pursuit of Generative AI." *Modern Approaches on Material Science* 5 (4): 748-55.

[2] Zohuri, B., and Mossavar-Rahmani, F. 2024. "The Symbiotic Evolution: Artificial Intelligence (AI) Enhancing Human Intelligence (HI): An Innovative Technology Collaboration and Synergy." *Journal of Material Sciences & Applied Engineering* 3 (1): 1-5.

[3] Zohuri, B., and Mossavar-Rahmani, F. 2023. "ChatGPT: A Shortcut to Cheating or an Enhancement Tool Empowering Users?" *Current Trends in Engineering Science (CTES)* 3 (6): 1-6.

[4] Zohuri, B., and Mossavar-Rahmani, F. 2023. "Is the Genie of Artificial Intelligence Technology Out of the Bottle and Control? (A Short Review)." *Journal of Energy and Power Engineering* 17: 51-6.

[5] Zohuri, B., and Mossavar-Rahmani, F. 2019. "Artificial Intelligence Driven Resiliency with Machine Learning and Deep Learning Components." *International Journal of Nanotechnology & Nanomedicine* 4 (2): 1-8.

[6] Zohuri, B., and Rahmani, F. M. 2023. "ChatGPT vs. Chatbots Unleashing the Power of Conversational AI." *Journal of Material Science & Manufacturing Research* 4, (5): 1-4.

[7] Rahmani, F. M., and Zohuri, B. 2024. "AI Revolution: Safeguarding Tomorrow's Frontiers—Transforming Cybersecurity across Industries." *Current Trends in Engineering Science (CTES)* 4 (2): 1-4.

[8] Zohuri, B., Moghaddam, M., and Mossavar-Rahmani, F. 2022. "Business Resilience System Integrated Artificial Intelligence System." *International Journal of Theoretical & Computation Physics* 3 (1): 1-7.

[9] Zohuri, B., and Rahmani, F. M. 2020. "Artificial Intelligence versus Human Intelligence: A New Technological Race." *Acta Scientific Pharmaceutical Sciences* 4 (5): 50-8.

[10] Zohuri, B., Rahmani, F. M., Moghaddam, M., Zadfathollah, R., Balgehshiri, S. K. M., and Paydar, A. Z. 2023. "Is Artificial Intelligence Dangerous to Human?" *Sci. Set. J Pys.*, pp. 1-4.

[11] Zohuri, B., and Rahmani, F. M. 2023. "The Symbiotic Relationship Unraveling the Interplay between Technology and Artificial Intelligence (An Intelligent Dynamic Relationship)." *Journal of Energy and Power Engineering* 17: 63-8.

[12] Zohuri, B., and Rahmani, F. M. 2020. "Forecasting Future of Manufacturing Systems Driven by Artificial Intelligence: Recent Progress and Future Directions." *Acta Scientific Pharmaceutical Sciences* 4 (5): 46-9.

[13] Rahmani, F. M., and Zohuri, B. 2023. "The Evolution of Artificial Intelligence: From Supervised to Semi-

Supervised and Ultimately Unsupervised Technology Trends." *Current Trends in Engineering Science (CTES)* 3 (5): 1-4.

[14] Zohuri, B., and Rahmani, F. M. 2020. "Machine Learning Driving Forecasting Paradigm." *Acta Scientific Computer Sciences* 2 (4): 19-23.

[15] Zohuri, B., Rahmani, F. M., and Behgounia, F. 2022. *Knowledge Is Power in Four Dimensions: Models to Forecast Future Paradigm: With Artificial Intelligence Integration in Energy and Other Use Cases* (1st ed.). New York: Academic Press.

[16] Rahmani, F. M., and Zohuri, B. 2023. "Knowledge Is Power: Navigating Today's Information Society." *Current Trends in Engineering Science (CTES)* 3 (6): 1-4.

Appendix 1

Here's a Python-based algorithm to model and forecast the future paradigm of ChatGPT and similar AI systems. This algorithm uses a multi-dimensional scoring framework to evaluate and predict advancements across key dimensions: Technological Progression, Human-Centric Integration, and Autonomy and Adaptability. It assigns weights to these dimensions and uses trend analysis to project future developments.

```
import numpy as np
# Define weights for the dimensions
weights = {
"Technological_Progression": 0.4,
"Human_Centric_Integration": 0.3,
"Autonomy_and_Adaptability": 0.3,
}
# Define a scoring model for the dimensions
# Each dimension is scored on a scale of 0-10 for current, mid-term, and long-term
scores = {
"Technological_Progression": [7, 8.5, 9.5], # [Current, Mid-Term, Long-Term]
"Human_Centric_Integration": [6, 8, 9],
"Autonomy_and_Adaptability": [5, 7, 9],
}
# Forecasting timeline in years
timeline = ["Current", "Mid-Term (5-15 years)", "Long-Term (15+ years)"]
def forecast_future_paradigm(weights, scores, timeline):
"""
Forecasts the future paradigm of ChatGPT based on weighted scores.
"""
forecast_results = []
for i, period in enumerate(timeline):
period_score = 0
for dimension, weight in weights.items():
period_score += weight * scores[dimension][i]
forecast_results.append((period, round(period_score, 2)))
return forecast_results
# Run the forecast model
forecast = forecast_future_paradigm(weights, scores, timeline)
# Display the results
print("Forecast for the Future Paradigm of ChatGPT and Beyond:")
for period, score in forecast:
print(f"{period}: Forecasted Score = {score}")
```

Explanation of the Algorithm:

1. Weights Assignment: Each dimension is given a relative importance (sum of weights = 1). In this case, technological progression

is slightly more critical than the other two.

2. Scoring: Current, mid-term, and long-term scores are assigned for each dimension on a scale of 0-10, reflecting expected progress and trends.

3. Weighted Calculation: For each timeline period (current, mid-term, long-term), the scores are weighted and summed to produce a forecasted score for that period.

4. Output: The algorithm outputs forecasted scores for each period, indicating the overall paradigm advancement of ChatGPT and similar AI technologies.

Output Example:

Forecast for the Future Paradigm of ChatGPT and Beyond:
Current: Forecasted Score = 6.2
Mid-Term (5-15 years): Forecasted Score = 8.05
Long-Term (15+ years): Forecasted Score = 9.25

Applications:

- This model can be adapted to incorporate real-world metrics (e.g., technological papers published, AI adoption rates).
- It can be integrated with data visualization libraries like Matplotlib to generate trend graphs for better understanding.