Exploring Extreme Events(X-event) in the High-Tech Science & Technology Field

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Abstract

An X-event is an event that is difficult to predict and unlikely to occur, but if it occurs, it has a very large ripple effect, such as loss of life, property, territory, and emotional turmoil. Extreme events are unlikely to occur, but they can happen someday, and if they do, they have a great impact on society as a whole, so they must be prepared to minimize the impact and impact. For this purpose, we collected opinions from low-level experts at the Korea Army Research Center for Future & Innovation and the Army College on extreme events that can trigger the near future (10 years) in the field of high-tech science and technology, which is currently developing rapidly after the 4th Industrial Revolution. The researchers intend to synthesize and analyze this data to derive implications and provide a response direction to alleviate the ultra-uncertainty of extreme events and provide a cornerstone for crisis management strategies for the occurrence of serial and simultaneous extreme events.

1. INTRODUCTION

Since the 4th Industrial Revolution, high-tech science and technology have been developing day by day, and ChatGPT is a hot topic these days. ChatGPT is an artificial intelligence chatbot service provided by Open AI, and AI answers when a user asks a question. The recently released ChatGPT-4 can understand the context of the question, recognize the image, and even enable advanced reasoning. With this performance and easy accessibility, ChatGPT has surpassed 1 million daily users in just five days since its release on November 30,

2022, and is now well over 100 million [1]. On the other hand, the development of such advanced science and technology is paradoxical. This is because terrorist or criminal organizations can also use ChatGPT to select the most effective time, place, method, and means. In this study, we would like to identify various situations that may arise from the paradox of advanced science and technology in the theoretical aspect of X-event that may occur in the near future and present directions for response.

2. A Theoretical Study of X-event

   X-event is difficult to predict and unlikely to occur, but if it occurs, it refers to events with great ripple effects such as loss of life, property, territory, and emotional turmoil. In other words, X-event is unlikely to occur, but it can happen someday, and if it does, it has a great impact on society as a whole. Representative X-events that have recently occurred include the September 11 terrorist attacks (2001), the influx of African refugees into Europe, the UK's withdrawal from the European Union (2016), and COVID-19 (2019). These X-event can occur not only in predictions of professional and authoritative institutions and media such as degree papers, historical analysis, and educational journals, but also in predictions in ordinary and secular groups and media such as artistic and poetic works, science fiction, unpublished records, and speeches. Paradoxically, what is considered the most likely future may rather be the least likely, and rather, opinions that are accepted as ridiculous and ridiculed and unlikely to come may be useful ideas for predicting extreme events. Therefore, in order to predict and prepare for extreme events, various opinions must be collected, and a small number of absurd opinions must be listened to [2].

3. Expert Opinion Analysis on X-event

   For this study, the Korea Army Research Center for Future & Innovation (KARCFI) and the Army College were selected as target groups. This is because the Army Future Innovation Research Center is a research institution that predicts the distant future from a social and cultural perspective to write an army vision, and the Army College is a specialized institution that studies and educates the near future strategic environment from a defense and security perspective. After selecting 20 experts with at least five years of future-related research experience for each institution, the researchers collected opinions on X-event that may occur in the field of high-tech science and technology within 10 years. Afterwards, the researchers synthesized their opinions as follows and derived meaningful results through grouping.

3.1 Summary of expert opinions by group

   Forty experts from the KARCFI Army Future Innovation Research Center and the Army College answered the Big Question in various ways, "What are the X-event that can occur in the near future (within 10 years)." However, due to space restrictions, all of the contents they mentioned were not included in this study. Instead, the key phrases mentioned by experts were extracted and organized by group as shown in <Table 1>. At this time, phrases with similar meanings were boldly integrated.

Table 1. Expert Opinions by Group

Group#1. KARCFI	Group#2. Army College
· Undetectable Malicious Code Distribution by Artificial Intelligence · The creation of a cyber state · Artificial intelligence transcends human intelligence · Evolutionary cyber terrorism based on reinforcement learning · Artificial intelligence and robot-driven life · Relying on Chemical Energy for the Advancement of Energy Technology Troubleshooting · Development of biotechnology that can sustain life forever · Transparent cloak, special forces using animal-type robots to carry out missions · Restricting Infrastructure Maintenance Due to Internet rupture · The fall in earth of a low-orbit satellite, Restriction of prediction through existing science and technology due to changes in electromagnetic fields, etc · Job losses due to advances in artificial intelligence technology, the problem of unemployment · The discovery of extraterrestrial life · A New Key Currency Based on Cryptocurrency Technology Appears · Transformation of fetal traits through specific genetic manipulation	· Commercialization of quantum computer technology · Political and military use of artificial Intelligence · Due to restrictions on electricity supply, which is highly dependent on the main source of energy, the economic, industrial and military sectors are devastated · Review on Moral Controversy in the Artificial Intelligence Secto · The development of weapons of mass destruction beyond nuclear weapons · Emerging as a potential threat country due to the development of asymmetric science and technology · Intensifying competition in space · Continued industrialization caused serious air pollution, severe food shortages · Increasing the value of science and technology personnel and recruiting human resources from third countries Continuous departure of scientific talent due to competition · Installation of Artificial Island on the East Coast · Ultra-long-range precision attack self-explosive drones appear · Deepening Cognitive Warfare in the Metaverse Space

3.2 Expert opinion grooming

Experts from the KARCFI and the Army College presented various opinions as shown in <Table 1>. Among their opinions were the latest trends, such as the paradox of the development of artificial intelligence technology, but some were unfamiliar, such as the discovery of alien life. In order to visualize these various opinions, as a result of reorganizing the contents of <Table 1> into similar categories, they were grouped into six categories as shown in <Table 2>.

Table 2. Expert Opinions

Classification	Details	Classification	Details
A (18 people)	· **Problem caused by artificial intelligence** – Distribution of Malicious Code by Artificial Intelligence – Control of privacy by artificial intelligence – AI out of control – Artificial intelligence transcends humanity – Cyber Terrorism by Reinforcement Learning of Artificial Intelligence – Human alienation and unemployment caused by artificial intelligence – Deepening Cognitive Warfare in the Metaverse Space	D (2 people)	· **The current uselessness of science and technology** – Low orbital satellite drop, wake up under the influence of electromagnetism, Satellite Orbit, etc, Prediction Limits – Blackouts devastate the economic, industrial and military sectors
B (4 people)	· **The formation of a new franchise** – The creation of a cyber state – Changes in the key currency – Exiting Science and Technology Workers to Third Countries – Emerging as a potential threat due to the development of asymmetric science and technology	E (2 people)	· **Moving into a new realm** – The discovery of extraterrestrial life – Intensifying arms race in space
C (9 people)	· **Overcoming the limitations of current science and technology** – Development of New Energy to Replace Fossil Energy – Development of life support / long-term alternative technology – The development of nuclear weapons – Development of an Artificial Island on the East Coast – Addressing weather problems such as global warming and air pollution – The creation of a new type of special force – Commercialization of quantum computer technology	F (2 people)	· **X-event aligned with other disciplines** – Simultaneous occurrence in connection with the population sector – Simultaneous occurrence in connection with the climate sector

Through <Table 2>, the opinions of experts are grouped into six fields, and they are visualized in order as shown in <Figure 1>.

A(Problem caused by artificial intelligence)

B(The formation of a new franchise)

C(Overcoming the limitations of current science and technology)

D(The current uselessness of science and technology)

E(Moving into a new realm)

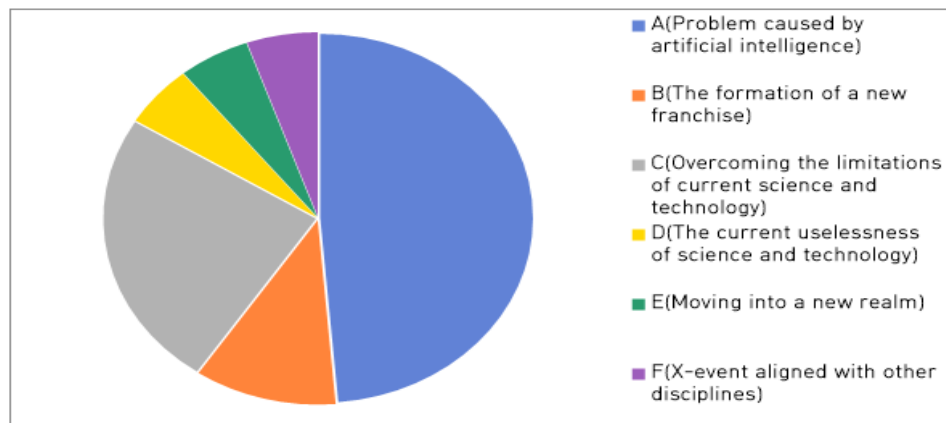F(X-event aligned with other disciplines)

Figure 1. Expert Opinions by Category

In a comprehensive analysis of this, experts at the KARCFI Army Center for Future Innovation Research Center and the Army College cited "problems caused by artificial intelligence" as the most likely X-event in the field of science and technology that can occur within 10 years. Next, we looked at the possibility of X-event arising from the radical development of science and technology, such as "the emergence of new technologies to overcome the limitations of current science and technology" and "the uselessization of current science and technology." In addition, he presented challenging and complex opinions such as 'formation of new hegemony such as cyber-state', 'human advancement into new areas', and 'the occurrence of X-event in population and climate linked to science and technology'.

4. Conclusion

The X-event, which can be triggered in the near future science and technology field selected by experts from the KARCFI Army Future Innovation Research Center and the Army College, was diverse. Among them, there were opinions that reflected the latest trends such as artificial intelligence technology, and opinions on new areas created from science and technology such as cyber countries. X-event has a characteristic that it is more likely to occur in unexpected fields than many people predicted. This is why attempts such as this study and follow-up studies are needed. In particular, if experts from the public, government, military, industry, academia, and research carry out systematic and continuous follow-up studies using collective intelligence, damage from X-events that can be unknowingly triggered can be minimized. Finally, with this study, we look forward to the emergence of artificial intelligence that predicts the form and timing of X-event by accumulating various data through the activation of X-event-related research in all fields of society.

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