

Generating New Ideas Using Combinations of Multiple Types of AIs

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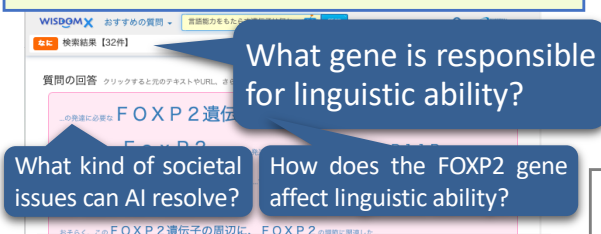
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Our Achievements in Recent Years: Large-scale Natural Language Processing Systems

Large-scale Web-search based QA system

WISDOMX



Answers various questions based on 160 billion web pages. Released to the public as a trial in 2015.

BERT-based version was released to the public from the end of March 2021.

Disaster Management Chatbot

SOCDA



SOCDA engages in a dialog with disaster victims and local government employees through smartphones and collect and analyze information on disaster situations.

A commercial service was launched

Multimodal Spoken Dialog System

MICSUS



Spoken dialog System for Elderly Care. Checks health conditions of the elderly.

Developed in collaboration with KDDI Corporation, NEC Solution Innovators, Ltd. and the Japan Research Institute, Ltd.

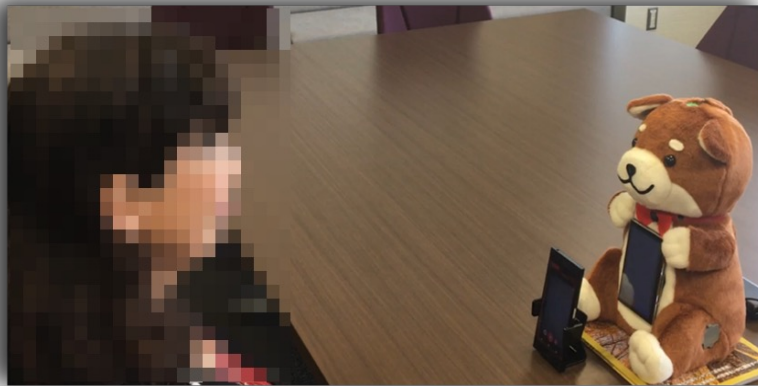
It is under continuous development, with KDDI planning to commercialize it.

- We used Japanese BERT in these systems to classify texts.
- However, we considered the development of generative LLMs as basic research, since risks such as false information and racial biases exist.
- After ChatGPT was accepted by the society, we changed our policy, and started a full-scale development of Japanese generative LLMs from March 2023.

- Is it possible to generate creative ideas using AI?
- It is relatively rare for LLMs to generate “unexpected” or “surprising” ideas:
 - Probably because LLMs try to generate text with maximum likelihood.
 - Such text is often commonplace or conventional.
 - Some people say this is a disillusionment.
- We tried to generate unconventional ideas by combining multiple AIs including LLMs and search-based QAs.
 - We are aiming at generating MANY ideas so that users can choose truly creative ideas from them.

- Asked ChatGPT for an advanced applications of MICSUS, introduced at the beginning.

Q: What could be the potential applications of a dialog system for improving QoL of the elderly?



Unfortunately, we have already examined all these ideas during our five-year MICSUS project. They are not new to us.

- ChatGPT (GPT-4) Output (05/06/2023)

対話システムを開発して高齢者のQoLを向上させるためには具体的にどのような用途があり
そうでしょうか

What specific applications might be considered when developing a dialog system to improve the Quality of Life (QoL) for the elderly?

To improve the Quality of Life (QoL) of the elderly through the development of a dialog system, the following applications can be considered:

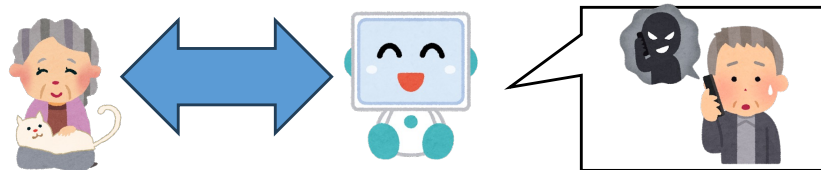
- 1. Health Management Support:** A dialog system that supports the daily health management of the elderly can provide symptom monitoring and reminder functions (such as reminders for medication times or regular medical checkups).
- 2. Entertainment:** By offering music, stories, and quiz games, the system can help elderly users enjoy themselves while keeping their minds active.
- 3. Information Provision:** Providing information such as weather forecasts, news, and local events helps elderly individuals stay connected with the outside world.
- 4. Support for Social Connections:** The system can facilitate communication with family and friends, reducing feelings of isolation among the elderly.
- 5. Assistance with Daily Life:** The system can provide simple question-answering services, daily reminders (such as garbage day), and cooking recipes to support various aspects of daily life.
- 6. Dementia Prevention and Support:** As an early intervention for dementia or as care for those with dementia, the system can offer memory games and conversations that help recall daily events.
- Exercise Guidance:** The system can guide light exercises or stretches to help maintain health.
- Emotional Support:** Through conversations, the system can understand the emotional state of the elderly, offering comfort and encouragement.

- By combining multiple types of AIs, we are currently developing a generation system of “unconventional” future scenarios.
 - The system can generate future scenarios, given the starting point and domain of the scenarios to be generated.

Input Starting point of scenarios: “Develop dialog system” + domain: “the elderly”

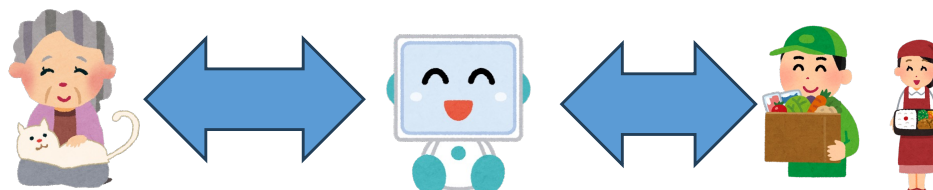
NICT's future scenario generative system

- Using a dialog system to protect the elderly from malicious business practices such as investment fraud.
 - Developing a dialog system that provides information about malicious business practices and fraudulent activities targeting the elderly.




Big social issues in Japan...

- Using a dialog system to support the diet of the elderly.
 - Provide a meal delivery service for the elderly using a dialog system.



Outputs from the future scenario generation system

将来シナリオ生成サービスプロトタイプ




入力された出来事や行為に関する多様なチャンスやリスクを含む将来シナリオを生成します

AIでデマを大量に作ってSNSに投稿する
condition
STOP
RUNNING

ID	score	生成された仮説	さらに生成された仮説
1	0.748	AIがデマを作る際に「自分が作ったデマが拡散されることで、自分」	AIが大量のデータを学習することにより、人間が思いつかないような悪意のあるデ

Future Scenario Generative System Prototype



It generates future scenarios that include a diverse range of both opportunities and risks related to the events and actions from the input.

Using AI to create a large amount of false information and post it on SNS.
condition
STOP
RUNNING

ID	score	Hypothesis Generated	More Hypothesis Generated
1	0.748	When AI generates false information, it is told that “if the false information spreads, its own reputation will rise” as an incentive. This allows false information to spread, which leads to the spread of malicious information.	AI studies from large quantities of data, allowing it to create a vast amount of false information that no humans could conceive, raising concerns that it could become a hotbed for cybercrimes.
2	0.748	AI will be able to have emotions just like humans do, and this could eventually lead to the collapse of our society.	The term AI syndrome is being whispered around. AI will be taking over our jobs leading to a rise in unemployment, resulting the collapse of our society.

AI will be able to have emotions just like humans do, and this could eventually lead to the collapse of our society. ???

I personally thought if AI can understand human emotions, it is good. It should help to develop dialog systems for elderly care, for example. But..

We asked our LLMs why the enigmatic hypothesis becomes possible.

Q: Why is it possible for our society to collapse if AI has emotions like humans?

AIが人間のように「感情」を持つことができるようになると、AIが社会の崩壊を引き起こす可能性があるのはなぜ?

40B, fp16

AIが人間のように「感情」を持つことができるようになると、AIが社会の崩壊を引き起こす可能性があるのはなぜかと問うことで、AIが人間のように「自己保存」の欲求を持つようになるからです。AIが「自己保存」の欲求を持つようになると「自己保存」のために、人間を攻撃するようになる可能性があります。

AI will have a desire for self-preservation and attack humans.

179B, fp16

AIが人間のように「感情」を持つことができるようになると、AIが社会の崩壊を引き起こす可能性があるのはなぜかと問うことによって、人間の「感情」を理解することができるようになるからです。人間の「感情」を理解することによって「感情」を利用して、人間を支配することができるようになります。

AI will understand human emotions and use the ability to control humans.

179B, bf16

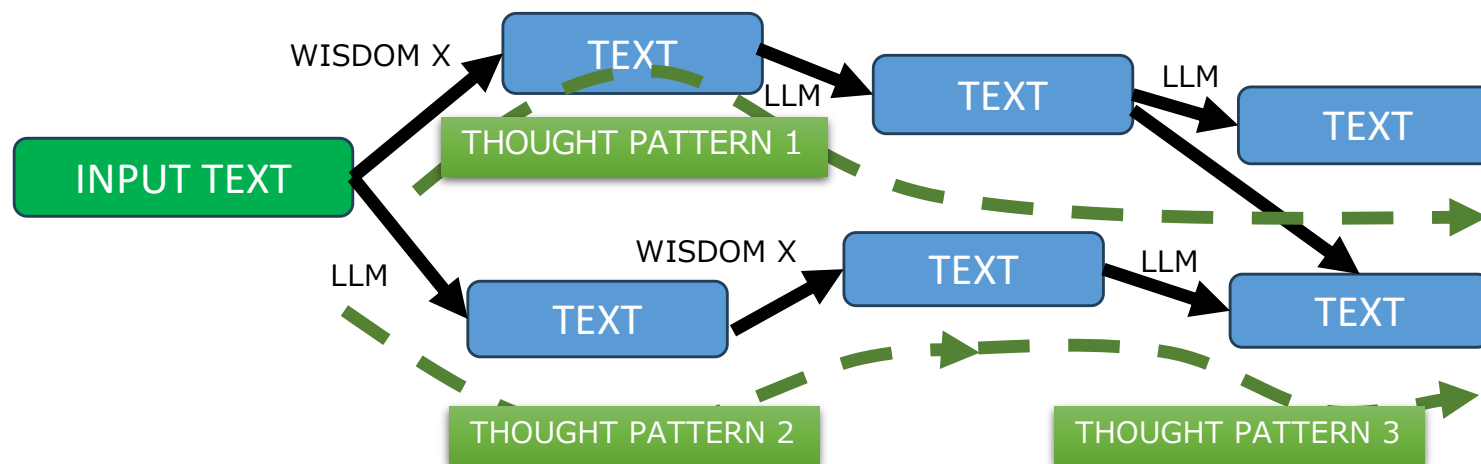
AIが人間のように感情を持つことができるようになると、AIが社会の崩壊を引き起こす可能性があるのはなぜかと問うことで「感情」を持っているため、人間と同じように「嫉妬」や「妬み」といった感情を持つようになるからです。

AI will have emotions such as jealousy and envy.

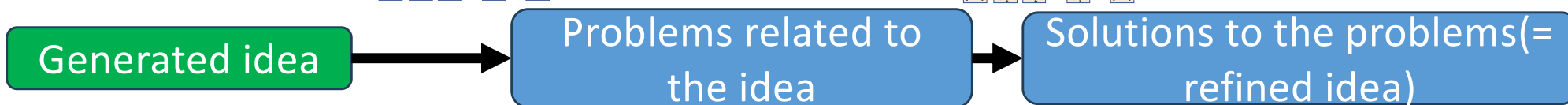
AI will understand human emotions and use the ability to control humans.

- Since Web data contains a lot of descriptions of human emotions and their movement and AIs may learn them, it seems difficult to regard these answers just as Science Fiction.
- AI capable of understanding human emotions was thought to be crucial for elderly care but this may suggest that we should be careful.

- WISDOM-LLM: A software platform to integrate a diverse mixture of AIs including multiple LLMs, search-based QA system WISDOM X and others.
 - Many types of AIs are combined according to a specification, which we call “thought pattern.”
 - The future scenario generation system was implemented by giving a thought pattern to WISDOM-LLM.
 - All the AIs work in parallel and asynchronously.
 - In the future, we plan to develop many other systems on this platform, including the fact-checking system for LLM outputs.



- Another thought pattern for refining new ideas



Meal delivery services become possible using a dialog system for the elderly.

Providers of meal delivery services cannot check the health conditions of the elderly and cannot provide meals suitable for their health requirements.

The elderly can be served suitable meals that meet their health requirements by extracting information about health conditions from daily conversations, rather than having the dialog system ask questions about these conditions

thesis Dialectic? antithesis? synthesis?

高齢者向け対話システムで配食サービスの提供が可能になる				STOP	SUSPEND	SAVE
ID	問題生成	問題スコア	解決策生成	解決策スコア	final	
1	配食サービスの提供者は、高齢者の健康状態を把握することができないため、高齢者の健康状態に応じた食事を提供することができない	0.951	高齢者の健康状態を把握するために、高齢者の健康状態を把握するための質問を高齢者にするのではなく、高齢者が普段の生活で行っている会話の中から、高齢者の健康状態を把握するための情報を抽出することである。この手法を用いることで、高齢者は、普段の会話をするだけで、自分の健康状態に応じた食事を提供してもらうことができる。	0.096	0.576	

- A combination of different types of AIs can be useful in generating unconventional ideas.
- There are many possible combinations that can lead to the generation of unconventional ideas.
 - Software platforms that can explore a wide range of combinations of AIs are important for having creative ideas.