



# **The Influence of AI on IP Practice in Japan**

**JPAA  
International Activity Center  
Jinhoon Yoon**

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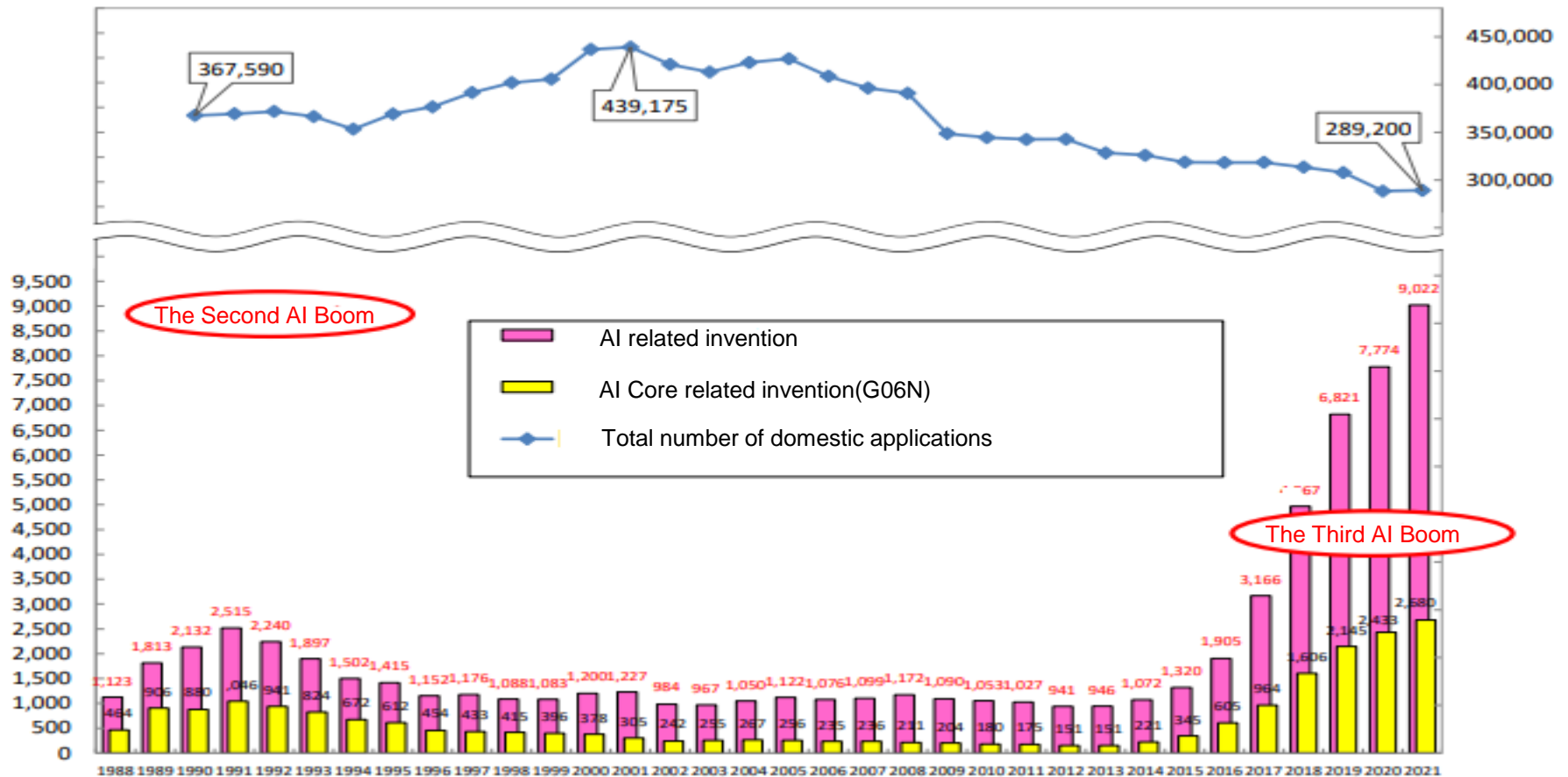
# Overview

- Statistics for AI-related inventions in Japan
- AI (Large Language Model; LLM)
- Application of Copyright Acts on AI
- Regulating and handling AI

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# Overall Application Trends in Japan

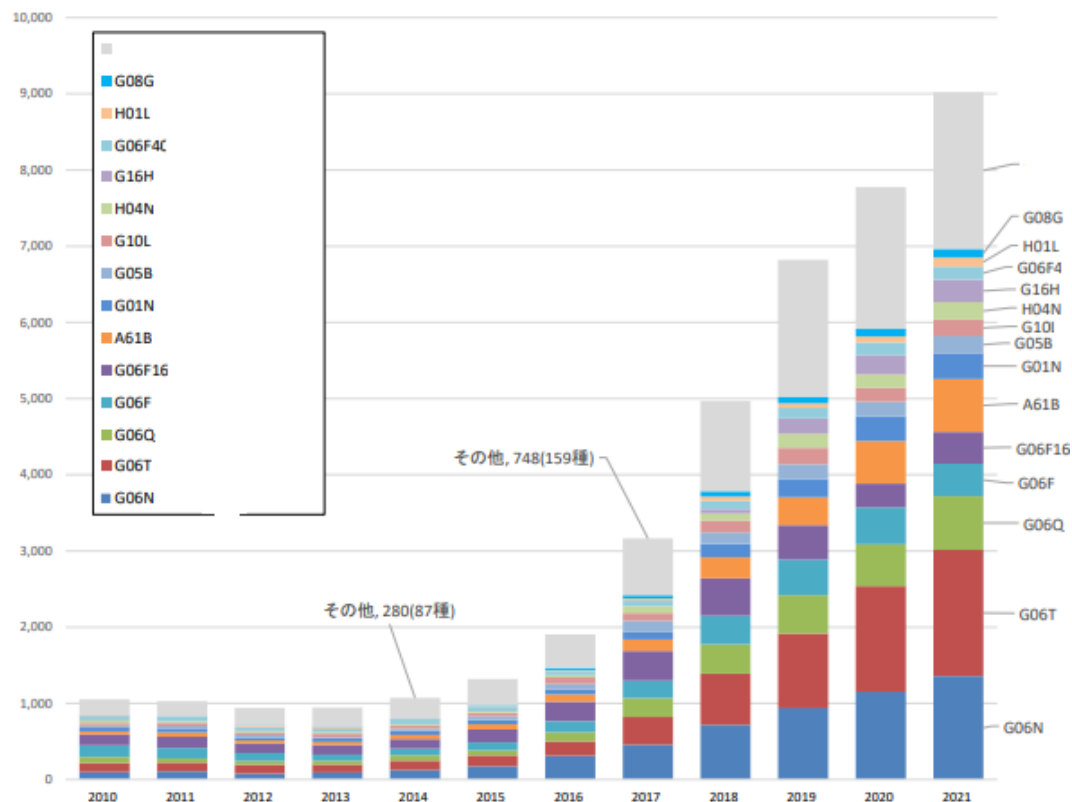


The number of applications for AI-related inventions (pink bars) has increased dramatically since 2014, with approximately 9,000 applications filed in 2021.

Among AI-related inventions, the number of AI core technology (G06N; yellow bars) applications filed in 2021 was approximately 2,700, and although the growth has slowed somewhat, it is still on the rise.



# Application Trends by Technology Field

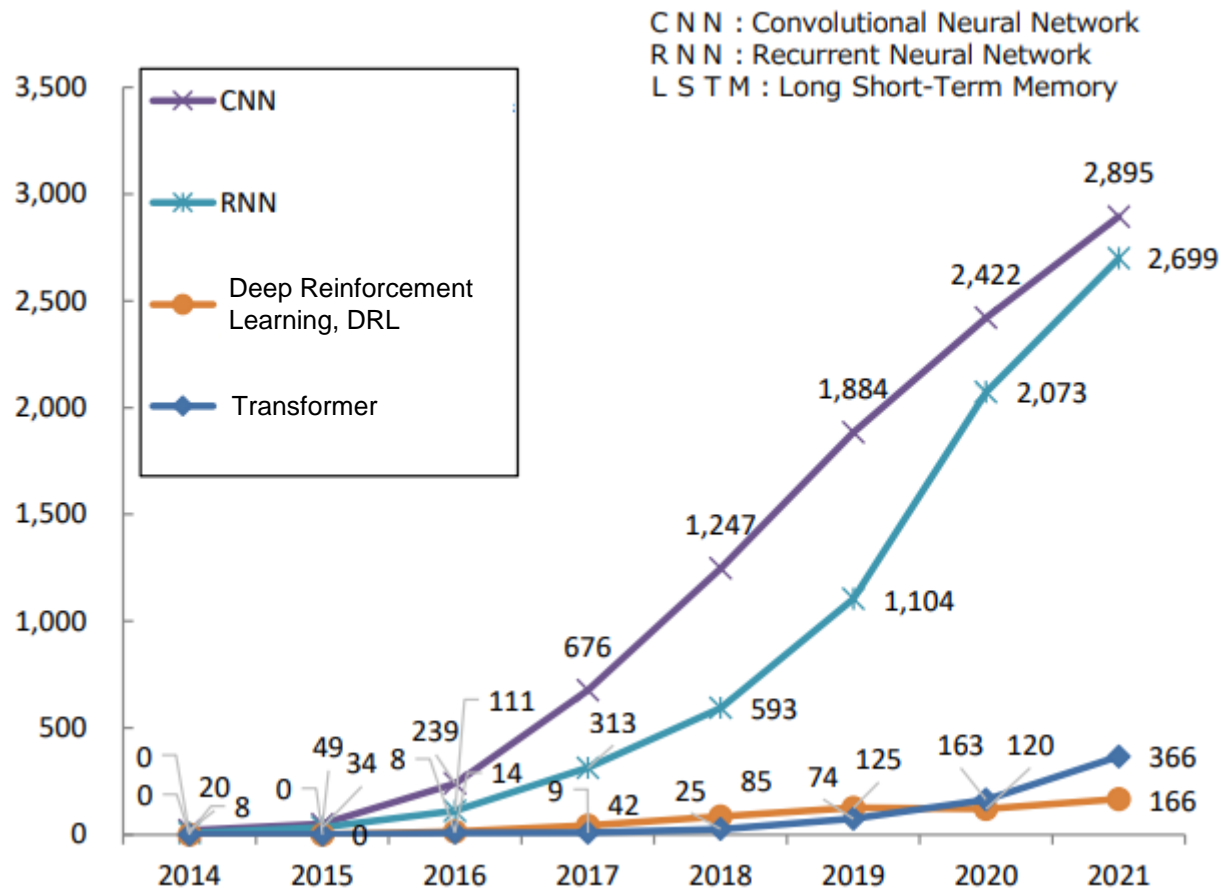


Other than G06N (AI core technology), G06T (image processing) is the most common main category for AI-related inventions.

The number of main categories grouped under "Etc." is also on the rise, indicating that the application of AI technology is expanding.



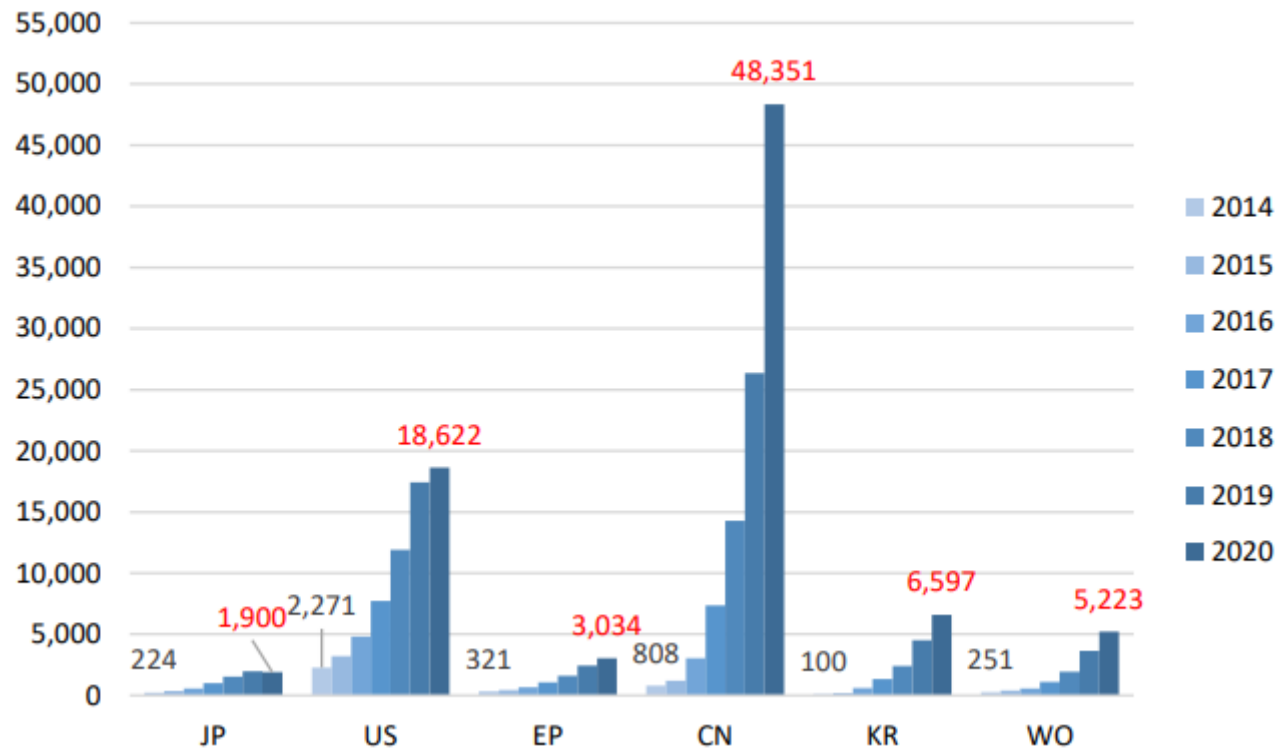
# Application Trends by Deep Learning



The number of AI-related invention applications referring to CNNs, RNNs or LSTMs has continued to increase since 2014. On the other hand, the number of applications referring to deep reinforcement learning has remained flat in recent years. The number of applications referring to transformers has been on the rise, surpassing that of deep reinforcement learning in 2020.



# The number of applications with AI core technology in IP 5



It can be seen that the number of applications with G06N (AI core technology) in all IP 5 offices is on the rise. In particular, the U.S. and China stand out in terms of the number of applications filed. The number of applications filed in the U.S. and China is particularly high, and both are the major destinations of applications in all IP 5 offices.



# Summary

## 1. Overall Application Trends in Japan

The number of applications for AI-related inventions in Japan is on the rise. The number of applications for AI-related inventions in Japan is on an increasing trend, although the growth of applications for AI core inventions has slowed somewhat.

## 2. Application Trends by Technology Field and Deep Learning

AI technology is increasingly being applied to the field of image processing, etc. This also indicates that the applicable fields of AI technologies are expanding. In addition, the number of applications for AI-related inventions referring to transformers is on the rise.

## 3. Application Trends in other countries

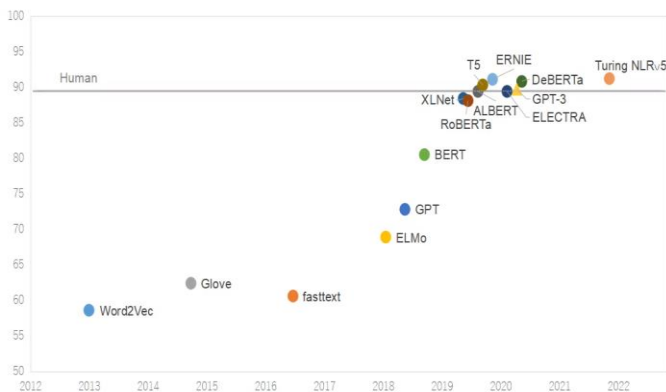
The number of applications with G06N (AI core technology) of IPC by the five national patent offices is on the rise, with the U.S. and China in particular showing a prominent increase in the number of applications.

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# Background to the birth of LLM

- One technology of the third AI boom, centered on deep learning
- Natural language processing accuracy has improved sharply since about 2018.
- Improved performance due to decrease in computing resource prices and increase in system size

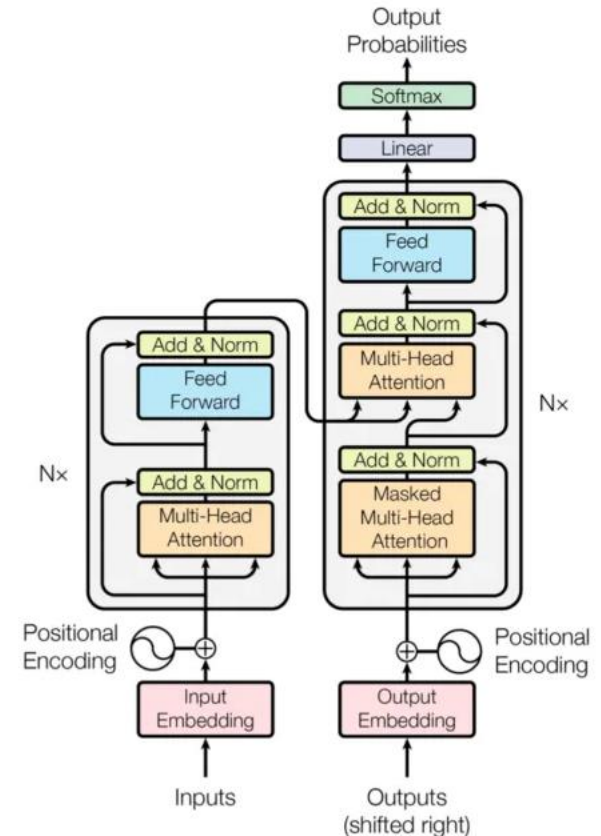
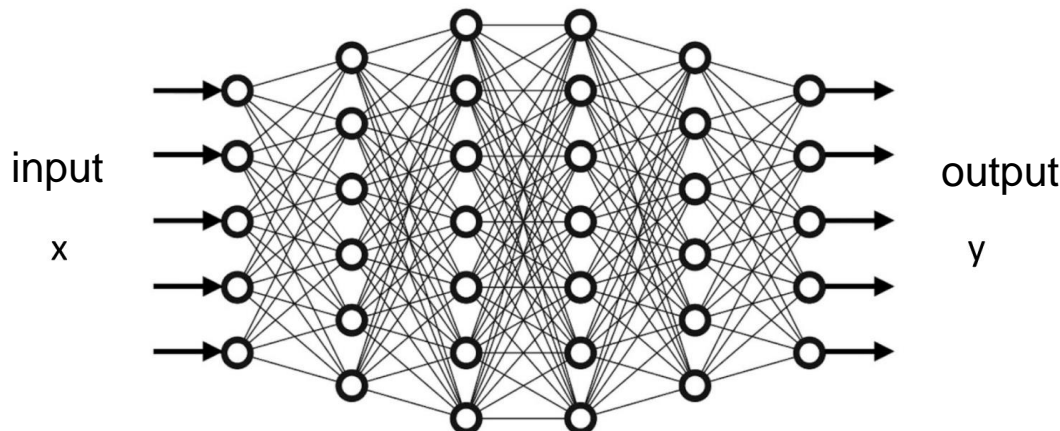


LLM	Release Date	developer	Maximum number of parameters
GPT-3	2020.6	OpenAI	175 billion
GShard	2020.6	Google (WWW search engine)	600 billion
Swich Transformer	2021.1	Google Brain	1.57 trillion
WuDao 2.0	2021.6	Beijing Jiyuan Institute of Artificial Intelligence	1.75 trillion
HyperCLOVA	2021.11	LINE and NAVER	39 billion
Gopher	2022.1	DeepMind	280 billion
Japanese GPT	2022.1	rinna	1.3 billion
GPT-3.5	2022.3	OpenAI	(Estimated) 355 billion
PaLM	2022.4	Google Reserch	54 billion
GPT-4	2023.3	OpenAI	(Estimated) 500 billion to 1 trillion

# Key Points of LLM Technology

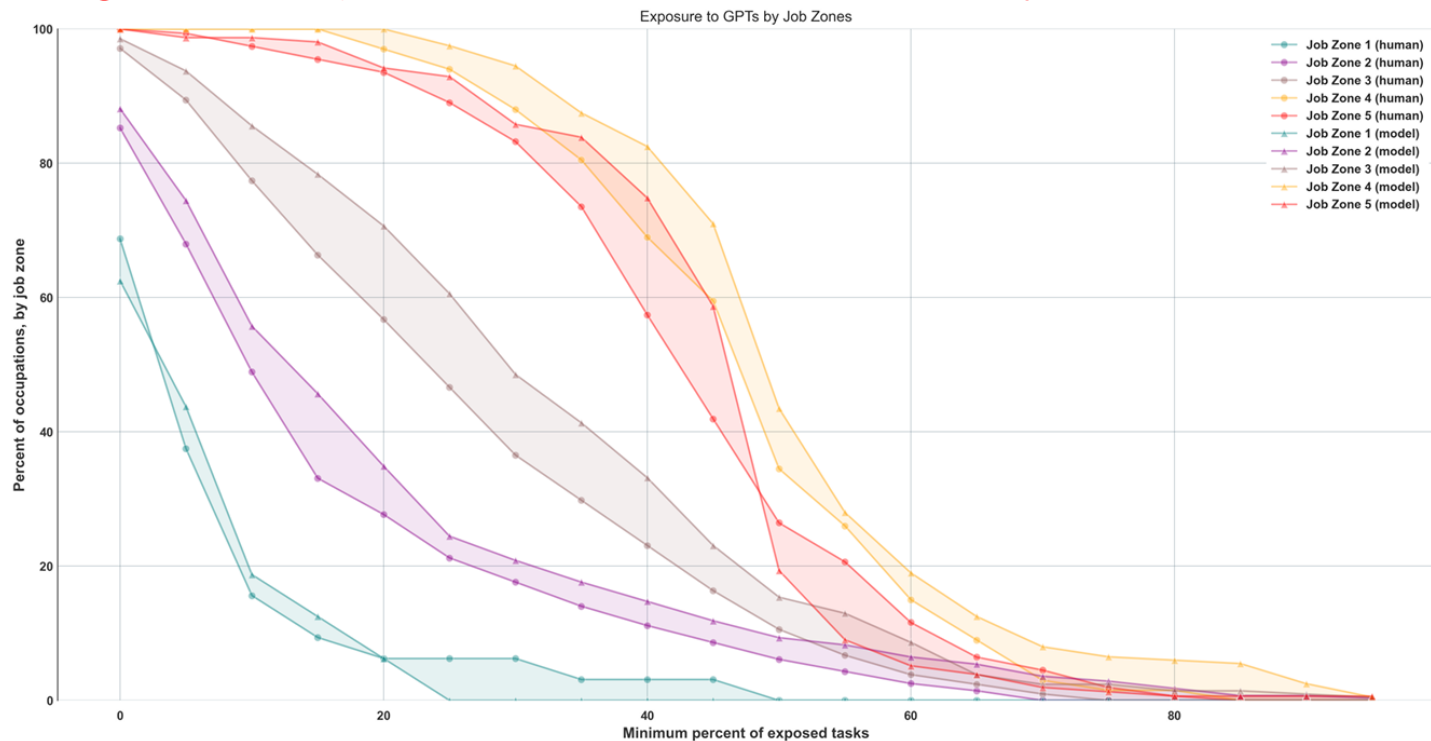
## Technical Background

- LLM is another form of deep learning
- Transformer ([L. Kaiser et al., 2017](#))
- Scaling Law ([J.Kaplan et al., 2020](#))



# Paper: Early Look at the Labor Market Impact

The paper states that the more educated people are, the higher the percentage of their jobs that will be substituted by AI.



# Paper: Early Look at the Labor Market Impact

Basic Skill	$\alpha$ (std err)	$\beta$ (std err)	$\zeta$ (std err)
<i>All skill importance scores are normalized to be between 0 and 1.</i>			
Constant	0.082*** (0.011)	-0.112*** (0.011)	0.300*** (0.057)
Active Listening	0.128** (0.047)	0.214*** (0.043)	0.449*** (0.027)
Mathematics	-0.127*** (0.026)	0.161*** (0.021)	0.787*** (0.049)
Reading Comprehension	0.153*** (0.041)	0.470*** (0.037)	-0.346*** (0.017)
Science	-0.114*** (0.014)	-0.230*** (0.012)	-0.346*** (0.017)
Speaking	-0.028 (0.039)	0.133*** (0.033)	0.294*** (0.042)
Writing	0.368*** (0.042)	0.467*** (0.037)	0.566*** (0.047)
Active Learning	-0.157*** (0.027)	-0.065** (0.024)	0.028 (0.032)
Critical Thinking	-0.264*** (0.036)	-0.196*** (0.033)	-0.129** (0.042)
Learning Strategies	-0.072* (0.028)	-0.209*** (0.025)	-0.346*** (0.034)
Monitoring	-0.067** (0.023)	-0.149*** (0.020)	-0.232*** (0.026)
Programming	0.637*** (0.030)	0.623*** (0.022)	0.609*** (0.024)

In the paper, science and critical thinking are less affected by AI, Writing and programming are considered more affected by AI.

Table 5: Regression of occupation-level, human-annotated exposure to GPTs on skill importance for each skill in the O\*NET Basic skills category, plus the programming skill. Descriptions of the skills may be found in Appendix B.

# What you can do with ChatGPT (general purposes)

Type of work	use case		
Corrections and proofreading of sentences	Point out not only grammatical errors but also areas for improvement in content		
Summary of sentences and concepts	Specify the number of characters for summary		
Bounce ideas off of someone, , Brainstorming	Point out what is missing in a certain idea	AI and humans talk to each other to generate new ideas	
Research, and Identification of key issues	Explain the gist of issues	Identify the key issues in a debate-style	Create a comparison table in a tabular format
Proposal of ideas	Form SEO-oriented title and keyword	Automatic generation of ad texts	Answer by pretending to be something you are not.
	Create an outline for a wedding speech	Propose contents for a popular blog	Generate examples
	⋮	⋮	⋮

Same task as before, but much more accurate

Due to ChatGPT's outstanding communication accuracy and overwhelming amount of knowledge (amount of data, number of parameters), it is now possible to do things that were never possible before.

# What you can do with ChatGPT (Patent Attorney Services)

Type of work	use case		
Corrections and proofreading of sentences	(Patent Specification Preparation and Response to OA) Check for errors in documents	(Patent Specification Preparation and Response to OA) Translation	(Patent Specification Preparation and Response to OA) Create a search expression for relevant patent literature
Summary of sentences and concepts	(Patent Specification preparation) Prior art research	(Response to OA) Case Summary	
Bounce ideas off of someone, , Brainstorming	(Response to OA) Verification of proposed response		
Research, and Identification of key issues	(Response to OA) Create a comparison chart between the present invention and cited inventions		
Proposal of ideas	(Patent Specification Preparation and Response to OA) Drafting a Patent Specification or a written argument	(Patent Specification Preparation) Creating a variant example	

- [Also, many back-office tasks can be replaced by AI.](#)



# Virtual Response Example by ChatGPT(GPT-4)

## Requesting a response from ChatGPT (GPT-4)

A trademark application was filed in Japan for the trademark "Ramen BANZAI" for the designated service of "provision of food and drink." A notice of rejection was issued on the grounds that it is similar to the cited trademark "Ramen BANGAI" for the designated service of "provision of food and drink."

As if you were a patent attorney, please draft a written opinion against the grounds for rejection.

# Virtual Response Example – 1/2 by ChatGPT(GPT-4)

## A Response from ChatGPT

Re: Opposition to Trademark Rejection – "Ramen BANZAI" (Application No. [Insert Number])

Dear Examiner,

We are writing in response to the rejection notice concerning the trademark application for "Ramen BANZAI" under the designated service of "provision of food and drink," due to its alleged similarity to the existing "Ramen BANGAI" trademark.

### 1. Distinctiveness in Phonetics and Semantics:

Firstly, it is important to highlight **the phonetic and semantic differences** between "BANZAI" and "BANGAI." While there is a superficial similarity in the sound, the ending syllables "ZAI" and "GAI" are distinct, reducing the likelihood of confusion. Furthermore, the connotations of "BANZAI," often associated with **celebration and enthusiasm**, are markedly different from "BANGAI."

### 2. Visual Distinction:

Visually, the characters used in "BANZAI" and "BANGAI" are **distinct, particularly the last characters**. This distinction becomes more **pronounced when the trademarks are rendered in stylized font**, as is common in the food and beverage industry.



# Virtual Response Example – 2/2 by ChatGPT(GPT-4)

## 3. Consumer Perception and Industry Context:

The **target consumers** for "Ramen BANZAI" are likely to be discerning and familiar with the nuances of different ramen brands. In the context of the food and beverage industry, where brand differentiation is crucial, it is unlikely that the average consumer would confuse "Ramen BANZAI" with "Ramen BANGAI."

## 4. Precedents and Comparative Cases:

[This section should include specific examples of previous decisions by the Japan Patent Office or courts where similar levels of phonetic and visual differences were deemed sufficient to distinguish trademarks in related industries.]

In light of these points, we respectfully request the reconsideration of the rejection notice. We believe that "Ramen BANZAI" possesses a sufficient distinctive character and is unlikely to cause confusion with "Ramen BANGAI."

We are prepared to provide further evidence or clarification as required.

Sincerely,

[Your Name]

[Your Position]

[Your Contact Information]



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# Japanese Copyright Act

## Article 30-4 (Amended in January 2019)

(Exploitation without the Purpose of Enjoying the Thoughts or Sentiments Expressed in a Work)

It is **permissible to exploit a work**, in any way and to the extent considered necessary, in any of the following cases, or in any other **case in which it is not a person's purpose to personally enjoy or cause another person to enjoy the thoughts or sentiments expressed in that work**; provided,

however, that this does not apply if the action would unreasonably prejudice the interests of the copyright owner in light of the nature or purpose of the work or the circumstances of its exploitation:

# Japanese Copyright Act

## Article 30-4 (Amended in January 2019)

(i) (...omitted...)

(ii) if it is done for use in **data analysis (meaning the extraction, comparison, classification, or other statistical analysis of the constituent language, sounds, images, or other elemental data from a large number of works or a large volume of other such data)**; the same applies in Article 47-5, paragraph (1), item (ii));

(iii) (...omitted...)

# Guidelines (May 30, 2023)

Relationship between AI and copyrights, etc.

- ✓ Copyrights protect works that "creatively express thoughts or feelings" and **do not cover mere data (facts) or ideas (work style, painting style, etc.)**.
- ✓ Regarding the relationship between AI and copyright, the applicable provisions of copyright law differ between the **"AI development/learning phase"** and the **"generation/utilization phase,"** and should be considered separately.

# Guidelines (May 30, 2023)

- AI Development/Learning Phase

- In principle, it can be used without the permission of the copyright holder.
- However, this provision does not apply if the use exceeds the limit deemed necessary .....

- Generation/Utilization Phase

- **Determination of copyright infringement** in the case of uploading and publishing images, etc. generated using AI, or selling copies, is **the same as for ordinary copyright infringement**, except in certain cases.
- If the generated image, etc. is **found to have similarity** to or **reliance** on an existing image, etc., the copyright holder can **claim damages or an injunction as copyright infringement**, or even be subject to **criminal penalties**.



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# Regulating and handling AI

Globally, each government is allowing the use of AI, but also regulating it

- Ministry of Education, Culture, Sports, Science and Technology (Japan) banned the use of AI to generate book reports. (Use for proofreading is acceptable.).
- Kobe City has established specified, by ordinances, which information is not allowed to be input for business use of AI (privacy information, information on corporations, and life protection information, etc.).
- Nature (Journal) bans publication of AI-generated images.
- EU AI Act mandates transparency in AI use (chatbots, content, etc.).
- An attorney in the U.S apologized for including non-existent examples of AI-created arguments.

Are regulations necessary in patent attorney practice?

- Should guidelines for the use of AI in patent attorney practice be established?
- If we enact it, should we just set forth a major policy? Or do we establish one for each operation?

Thank you so much for  
your listening!