Summary of Application Status Survey Results for AI-related Inventions in FY2024

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Key points of the survey results

·<u>Overall Trends in Applications</u>

The number of applications for AI-related Inventions*1 in Japan is on the rise. The growth of applications for AI core Inventions has slowed slightly, but is still on the rise.

·<u>Application Trends by Technology Area and by Deep Learning</u>

AI technologies are increasingly being applied to the image processing field. It also suggests that the application of AI technology is expanding. In addition, the number of applications for AI-related Inventions referring to transformers is on the rise.

· <u>Application Trends in Major Countries</u>

The number of applications for which G06N (AI Core Technology) as IPC has been allocated is on the rise in Japan, Europe, China and Korea, with the number of applications in China being particularly prominent.

*1 For the purpose of this survey, AI Core Inventions (inventions characterized by mathematical or statistical information processing technology underlying AI; FIs allocated are mainly G06N) and AI-applied Inventions (inventions characterized by the application of mathematical or statistical information processing technology underlying AI to various technical fields) are defined as "AI-related Inventions" and are included in the scope of this survey. This definition is valid only within the scope of this survey and does not represent an official definition by the JPO.

1. Overall Trends in Applications

AI-related Inventions (the pink bar) have increased sharply since 2014, with about 10,300 in 2022. AI-related Inventions to which G06N is allocated (the yellow bar) have also increased steadily with about 3,000 in 2021, and is still on the rise, although the growth has slowed somewhat.
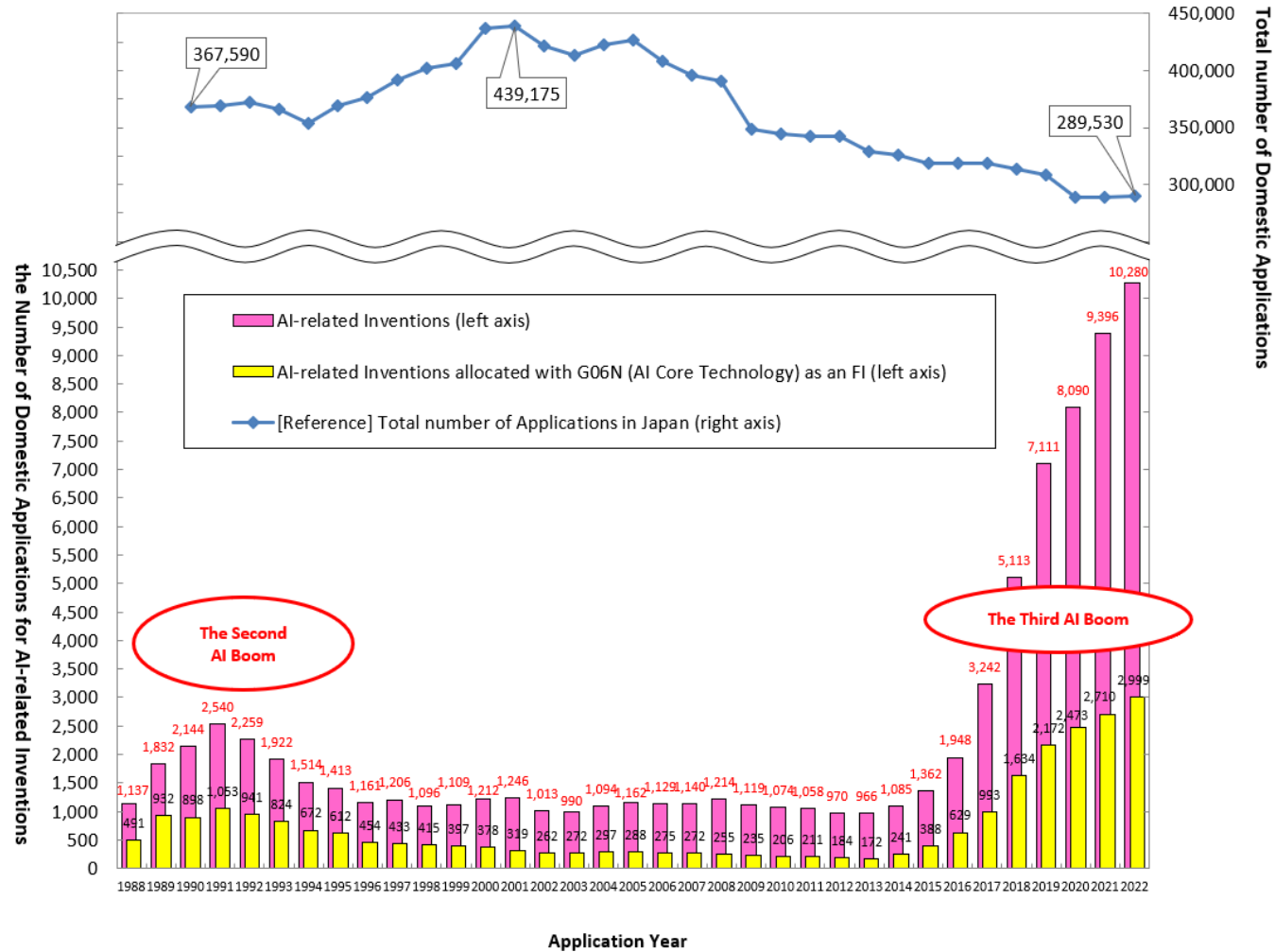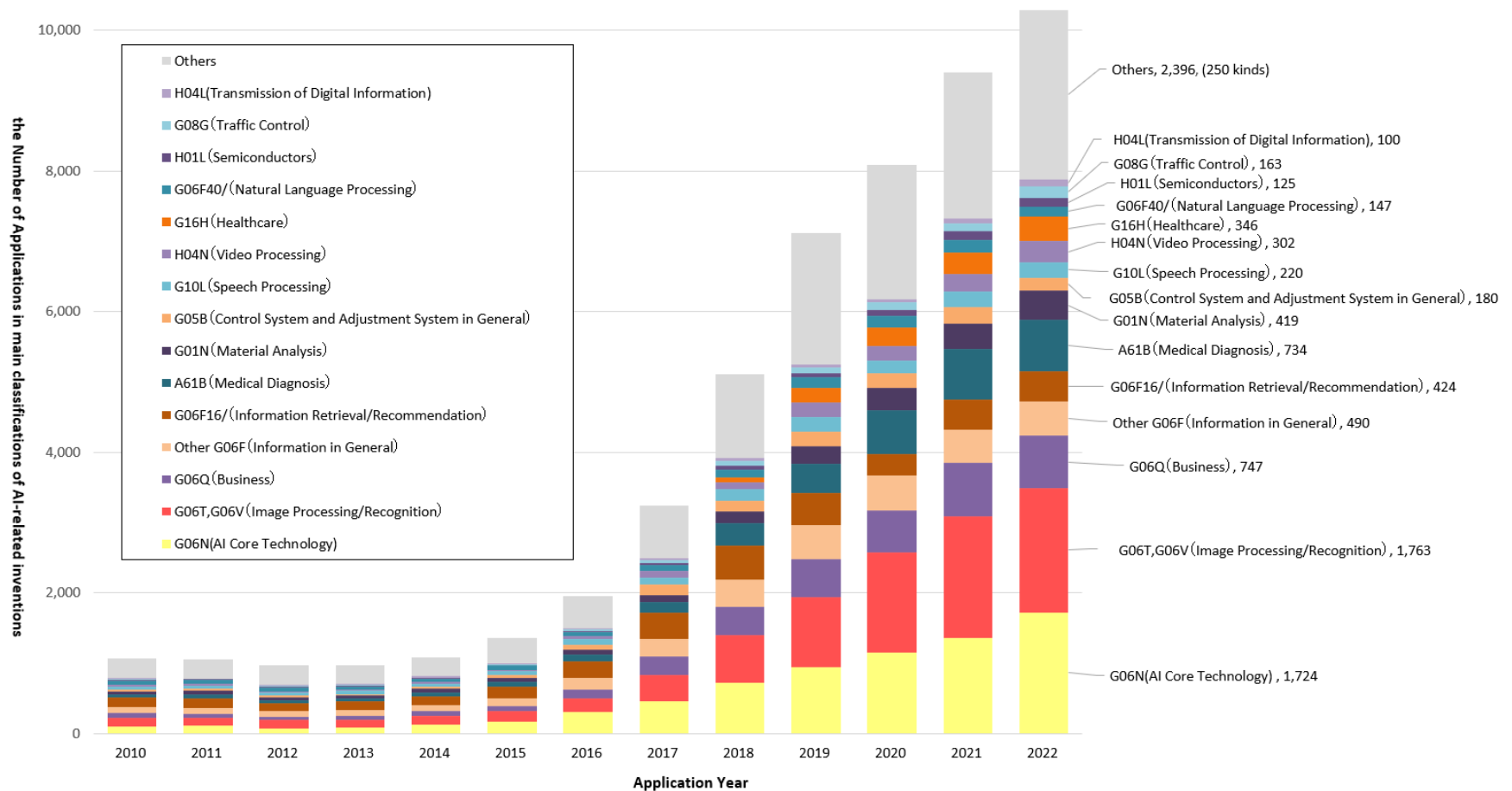

The number of domestic applications for AI-related Inventions

2. Trends of Applications by Technical Field

As the main classification*1 of AI-related Inventions, G06T, G06V (Image Processing/Recognition) is the most common, other than G06N (AI Core Technology). The number of technical fields that can be grouped under "Others" is also on the rise, suggesting that the application of AI technology is expanding.

*1   The classification that best describes the invention.

Composition of main classifications of AI-related Invention (with the numbers shown in 2022, etc.)

3. Trends of Applications for Deep Learning

The number of applications for AI-related Inventions referring to CNN, RNN, or LSTM has been increasing since 2014. On the other hand, the number of applications for AI-related Inventions referring to Deep Reinforcement Learning has remained flat in recent years. In addition, the number of applications for AI-related Inventions referring to Transformers has been on the rise, surpassing that of Deep Reinforcement Learning in 2020.

CNN : Convolutional Neural Network
RNN : Recurrent Neural Network
LSTM : Long Short-Term Memory
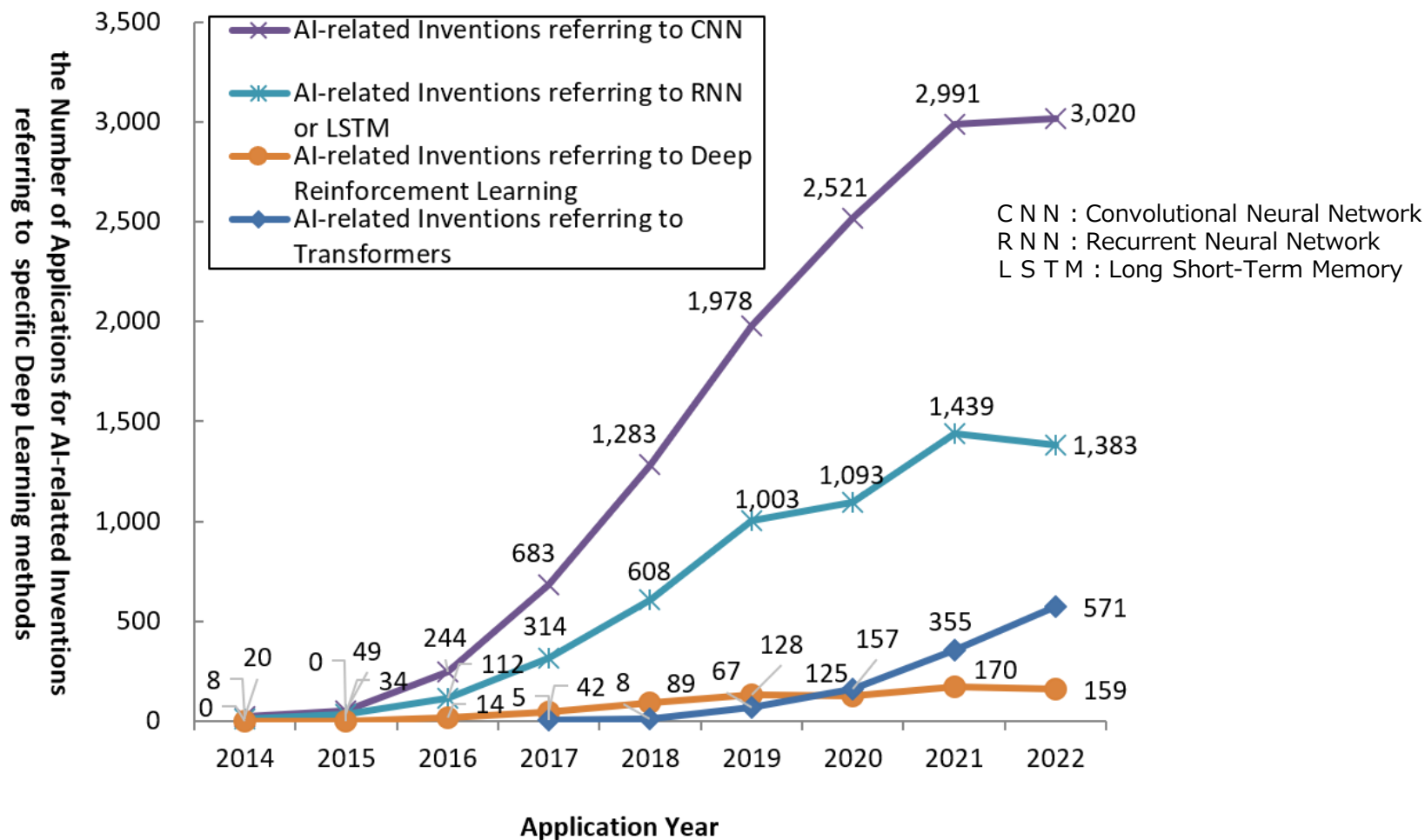
The number of applications for AI-related Inventions referring to specific Deep Learning methods

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４. Application Status in Major Countries

It can be seen that the number of applications allocated with G06N (AI Core Technology) granted is increasing in Japan, Europe, China and Korea. In particular, China stand out in terms of the number of applications filed, with both being the major application destinations among five IP offices.
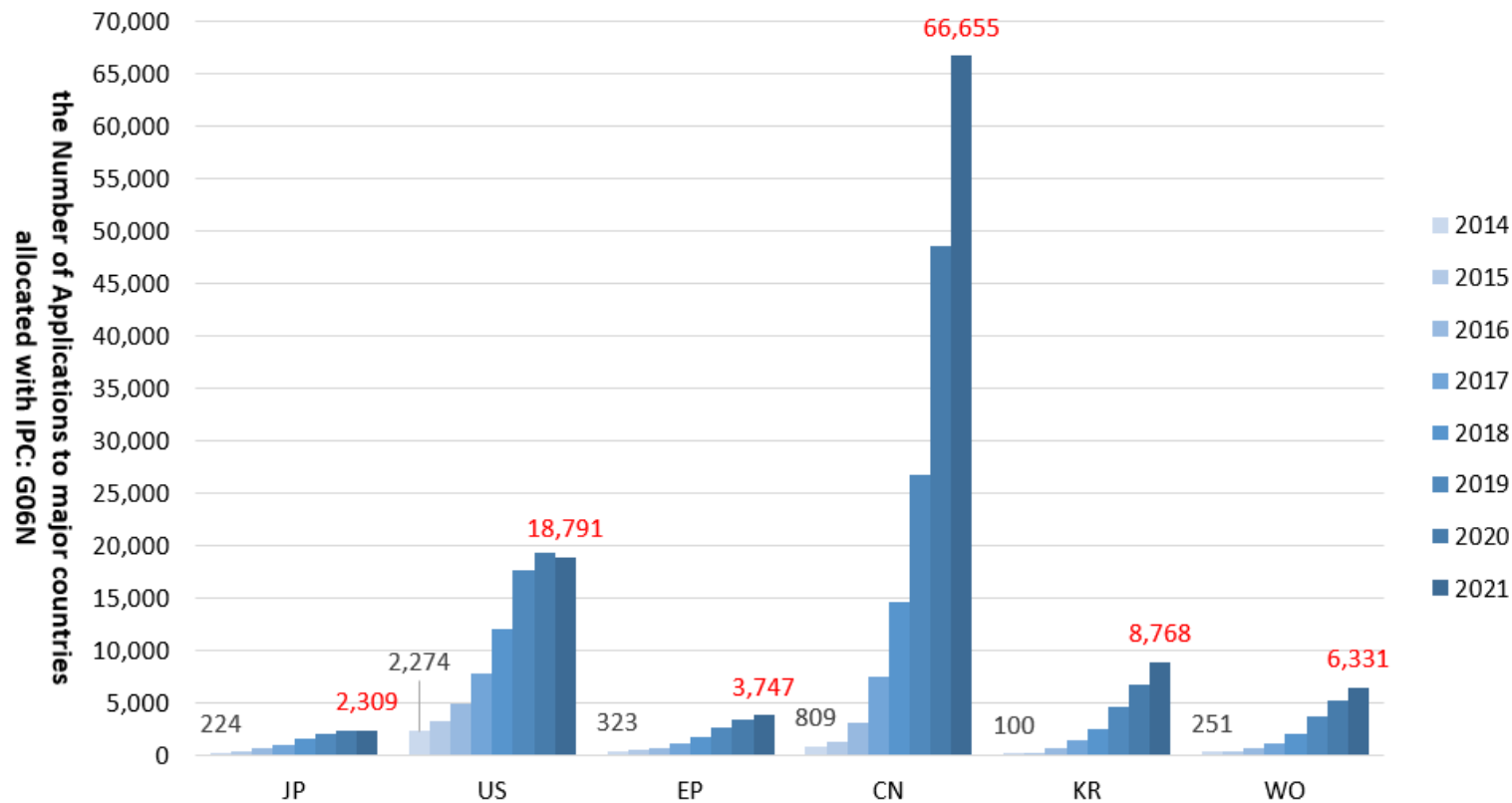
The number of applications to major countries allocated with IPC: G06N (AI Core Technology)
(with the numbers in 2014 and 2021 noted)

【Remarks】
- The data in "4. Application Status in Major Countries" were obtained from WIPO Patentscope and the JPO prepared the graphs (retrieved on September 19, 2024). Due to the difference in databases, the number of JP applications does not match the number of domestic applications in "1. Overall Trends in Applications" and "2. Trends of Applications by Technical Field".
- The number of applications in recent years may not reflect all the data, depending on the timing of reflecting the application to the database. In addition, the allocated IPC may be changed depending on the examination process, etc.
- The country codes in the chart mean JP: Japan, US: the U.S., EP: Europe (EPO), CN: China, KR: Korea, and WO: PCT international applications (regardless of the applicant's nationality).