

Ricoh and RIKEN develop a proprietary algorithm to visualize critical junctures of technological trends from literature data

Successful quantitative assessment of emerging technology indicators

TOKYO, June 14, 2023 – Ricoh Company, Ltd. (President and CEO: Akira Oyama) and the RIKEN Interdisciplinary Theoretical and Mathematical Sciences Program (iTHEMS, with Senior Visiting Scientist Hideaki Aoyama and Visiting Scientist Wataru Souma) have jointly developed an algorithm to quantitatively measure and understand critical junctures of new trends based on existing technical literature data.

Recent years have seen a surge in the development and application of research methods that utilize data to comprehensively and quantitatively grasp global technological trends. The traditional data analysis approach to understanding technological trends is to analyze the keywords described in patents, papers, and other technical documents. However, because this approach does not track changes over time, it is difficult to quantitatively capture the indicators of emerging technologies.

In this joint research project, which was conducted between March 2022 and February 2023, Ricoh and RIKEN developed a unique algorithm that can discern quantitative patterns of increase or decrease of keywords appearing in chronological data, which succeeded in visualizing indicators of emerging technology. This means, for example, that by focusing on keywords that have rapidly increased in recent years, researchers can identify critical junctures of technological trends and select research topics earlier. This algorithm technology is also powerful in its ability to analyze any type of chronological data, in addition to literature data. A patent application has been filed for this technology.

Hideaki Aoyama, Senior Visiting Scientist, iTHEMS, RIKEN and Emeritus Professor, Kyoto University says, "This new algorithm is a product of purely academic research we have been conducting at iTHEMS, RIKEN, driven and supported by Ricoh's strong motivation for tools to evaluate and classify development of new technologies. The core of this method is a low-dimensional mapping of normalized cumulative development curves, whose calculational method is easily understandable, and the resulting diagram (map) allows straightforward understanding by users. Furthermore, this mapping method can be applied to many fields of data classification. I am pleased that Ricoh is the leader in using this exciting technology."

Koichi Ike, IP Landscaper Expert, Intellectual Property Center, Ricoh Company, Ltd. adds, "By conducting data-driven research using this technology, Ricoh will bring comprehensiveness and speed to its search for new research and development topics, thereby contributing to the search

for emerging research themes and the creation of high-value intellectual property. We are proud of this technology, as it embodies Ricoh's Mission and Vision of "Fulfillment through Work" to transform how people work and shape the future of work."

Related Information

A visualization method to detect indicators of emerging technologies

https://www.ricoh.com/technology/tech/125_detect_indicators_of_emerging_technologies

Initiatives in Intellectual Property

<https://www.ricoh.com/technology/rd/ip>

<For inquiries about the technology>

https://webform.ricoh.com/form/pub/e00114/technology_inq_en

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Ricoh is a leading provider of integrated digital services and print and imaging solutions designed to support digital transformation of workplaces and optimize business performance.

Headquartered in Tokyo, Ricoh's global operation reaches customers in approximately 200 countries and regions, supported by cultivated knowledge, technologies, and organizational capabilities nurtured over its 85-year history. In the financial year ended March 2023, Ricoh Group had worldwide sales of 2,134 billion yen (approx. 16.0 billion USD).

It is Ricoh's mission and vision to empower individuals to find Fulfillment through Work by understanding and transforming how people work so we can unleash their potential and creativity to realize a sustainable future.

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