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Hitachi Wins First Place in Multiple Tasks of CoNLL 2020 Shared Task and SemEval 2020, International Competitions for Natural Language Processing

This achievement is the first time for a Japanese company, producing novel technologies in AI and Natural Language Processing fundamentals

Tokyo, December 02, 2020 --- Hitachi, Ltd. (TSE: 6501, Hitachi) today announced that it has won in multiple tasks in both CoNLL 2020 Shared Task and SemEval 2020, which are international competitions for natural language processing. This is the first time for a Japanese company to win first place in both competitions in the same year, and the first time for a Japanese company to win first place in the CoNLL Shared Task.
In order to accelerate the digital transformation (DX) of society and enterprises, Hitachi has been focusing on research and development of digital solution technologies in artificial intelligence (AI) and IoT technologies that analyze rapidly growing social and customer data to solve their problems.
In the field of AI, Hitachi has been conducting research on analyzing and processing natural languages such as Japanese and English that are used in daily communication, and Hitachi was able to achieve this result while participating in the competition to develop fundamental technology and human resources.
Hitachi will continue to contribute to increasing the value of customers and improving the Quality of Life (QoL) of people through research and development of AI and natural language processing.

Natural language used in verbal communication can be analyzed and processed using AI to improve the efficiency of business operations and support decision making. To date, Hitachi has developed debating AI that enables AI-human logical dialogue, technology that extracts information necessary for investment decisions from documents such as security reports, and technology that understands human emotions and intentions through question-answering.
Hitachi to date has also been participating in various competitions to further develop fundamental technologies and to cultivate human resources such as data scientists. Both competitions in which Hitachi won in multiple tasks this year have been organized for more than 20 years by a special-interest group of the Association for Computational Linguistics (ACL), an international scientific society for natural language processing, and also prominent companies and universities around the world had been participated in the competitions. CoNLL Shared Task has been focusing on linguistic and

grammatical processing. The shared task has been established various fundamental technologies including grammatical error correction and syntactic parsing. SemEval has been focusing on semantic understanding including a wide range of tasks from fundamental to application.

CoNLL 2020 Shared Task

In this competition, Hitachi was highly recognized for a novel technology for meaning representation parsing. The technology analyzes the semantic structure of sentence meanings, such as "who is doing what to whom," and utilizes machine translation technology to provide a unified analysis for different structures and different languages.

Task in which Hitachi won first place	Overview
Cross-framework track	This track is targeting at parsing English sentences into five different meaning representations. Hitachi was highly recognized for its formulation using machine translation technique and the architecture of its deep learning model.
Cross-lingual track	This track is targeting at parsing meaning representations across multiple languages. The points of Hitachi's technology highly evaluated are the same as above.

SemEval 2020

The competition is basically for semantic understanding, which evaluates semantics expressed in a sentence and what meaning or intent is contained in the sentence. Hitachi applied a highly accurate semantic understanding technique based on deep learning ensemble.

Task in which Hitachi won first place	Overview
Task 3, (Subtask 1, Slovenian), Predicting the (Graded) Effect of Context in Word Similarity	The task is to estimate the contextual similarity between words. Hitachi utilized pre-trained deep learning models in multiple languages, and analyzed the common properties of each model.
Task 7, (Subtask 1 and 2), Assessing Humor in Edited News Headlines	The task compares the edited sentence with the original sentence, assessing the humor. Hitachi has improved the accuracy by using deep learning ensemble.
Task 11, (subtask-SI), Detection of Propaganda Techniques in News Articles	The task is aimed at detecting propaganda in news articles. Hitachi has developed a novel deep learning model.

Hitachi will apply the fundamental technologies highly recognized in the competitions to business solutions, and to develop further novel technologies for AI and natural language processing to increase the value of customers and improve the QoL of people by promoting DX, thereby contributing to the development of a sustainable society.

Acknowledgement
Computational resource of AI Bridging Cloud Infrastructure (ABCI) provided by National Institute of Advanced Industrial Science and Technology (AIST) was used.

About Hitachi, Ltd.
Hitachi, Ltd. (TSE: 6501), headquartered in Tokyo, Japan, is focused on its Social Innovation Business that combines information technology (IT), operational technology (OT) and products. The company's consolidated revenues for fiscal year 2019 (ended March 31, 2020) totaled 8,767.2 billion yen ($80.4 billion), and it employed approximately 301,000 people worldwide. Hitachi drives digital innovation across five sectors – Mobility, Smart Life, Industry, Energy and IT – through Lumada, Hitachi's advanced digital solutions, services, and technologies for turning data into insights to drive digital innovation. Its purpose is to deliver solutions that increase social, environmental and economic value for its customers. For more information on Hitachi, please visit the company's website at https://www.hitachi.com.

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