

Kyoto University and Fujitsu Launch Joint Research Project to Advance Medicine through the Use of AI

Kyoto, Tokyo, and Kawasaki, January 24, 2018 – Kyoto University, Fujitsu Limited, and Fujitsu Laboratories Ltd. today announced that they have established the Department of Medical Intelligent Systems, a joint research project at the Kyoto University Graduate School of Medicine to use artificial intelligence (AI) in the field of medicine. The research activities are being conducted as of January 2018 and will run for approximately two years.

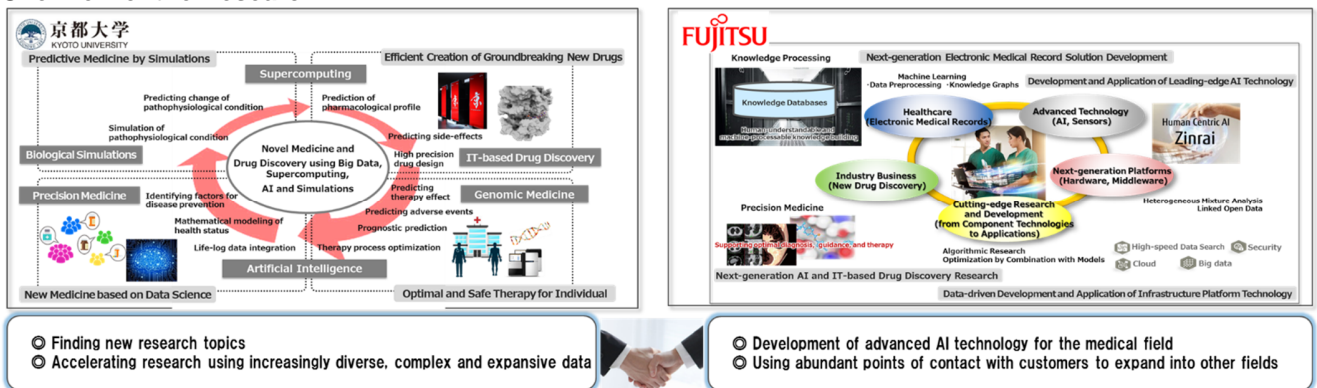
The joint research project will use all types of medical information, including patient data accumulated on electronic medical records collected by Kyoto University Hospital and the Fujitsu Group's advanced AI technology, Fujitsu Human Centric AI Zinrai. Through collaboration between Kyoto University's physicians and bioinformatics researchers (*1) and the Fujitsu Group's AI engineers, the project will leverage this information and use AI to accelerate R&D toward advanced, next-generation medicine, such as creating new approaches to diagnostic support and drug discovery. Fujitsu and Kyoto University aim to apply the knowledge database platform they've developed through their joint research and the insights it elicits to related fields, such as health insurance, and broadly put them to use for the benefit of society.

Background

With rapid advances in scientific technology, the digitalization of medical front lines continues to progress, and a wide range of medical information (real world data) is being accumulated. It is strongly anticipated that this trend will bring about advanced, next-generation medical care that will deliver optimal care to patients, stemming/resulting from the combination of this data with revolutionary advances in AI to evaluate and analyze medical information, while applying it to the actual clinical front lines.

Currently, AI has already demonstrated an impressive ability to evaluate and analyze certain types of medical images. At the same time, to build AI that can make more sophisticated determinations, it is necessary to use detailed clinical time series data. Much of this data, however, consists of unstructured information, such as notes written by medical personnel. Moreover, there is not yet any AI technology that, in a practical application, can integrate and link together the huge volumes of various types of data, such as the text and figures in electronic medical records, reports in medical journals, genomic data, and diagnostic images. To put this data to use, it has become essential to develop AI for medicine through the close collaboration of researchers with a high degree of knowledge of the medical field with AI researchers and engineers.

Overview of the Research



1. Research Period

January 2018 to March 2020

2. Name of the Joint Research Project

Department of Medical Intelligent Systems (Project Leader: Department of Biomedical Data Intelligence, Graduate School of Medicine, Kyoto University Dr. Yasushi Okuno)

3. Project Location

Clinical Research Center for Medical Equipment Development (CRCMeD), Kyoto University Hospital (located in Kyoto)

4. Description of the Research

The research will use a wide range of different and highly sophisticated medical data, including:

- Patient data collected on the electronic medical records of Kyoto University Hospital
- Cancer patient data recorded in the Kyoto University Cancer Treatment Support Database System
- And cohort data (*2)

For all of the above, consent has been applied for and given by an ethics committee from the Department of Biomedical Data Intelligence and the Clinical System Oncology Project of the Kyoto University Graduate School of Medicine.

To be able to use AI to generate new knowledge and insights, the data will first be preprocessed using AI (natural language processing), and an environment for analysis will be built. Next, with this huge volume of comprehensively sorted data, another form of AI (machine learning) will be used to extract the common characteristics for each disease indication and create models that will contribute to new approaches to diagnostic support, including the identification of specific disease characteristics from medical images, and the discovery of next-generation drugs. In addition, research will be conducted on advancing AI technology specifically within the field of medicine.

The new knowledge and insights discovered, as well as the AI technology for the medical field, will be comprehensively built onto a platform, leading to the future realization of a knowledge database that can be widely used in the medical field.

Data to be used

- a. Electronic medical records stored by Kyoto University Hospital as well as data from its diagnostic support database system
- b. With consent from an ethics committee by Kyoto University, data for use in cohort research that has been approved by the steering committee of the Department of Medical Intelligent Systems
- c. Public text data from sources such as diagnostic/treatment guidelines and prescription drug documentation

All patient data and cohort research data used in this joint research will be rendered anonymous.

5. Respective Responsibilities

Kyoto University will provide the expertise of its doctors and bioinformatics researchers, personnel training, and evaluation of clinical data.

Fujitsu Group will offer AI technology and big data analysis technology, development of AI technology for the medical field, and construction of the knowledge database platform.

Expectations for the Joint Research Project

By using AI to analyze the large volumes of advanced medical data that have been accumulated on the front lines of medicine, Kyoto University and Fujitsu expect to not only improve the quality of medical care, but also to discover new treatments and diagnostic methods. The partners anticipate that this could precipitate major social change, not only in the medical field, but also in related fields like pharmaceuticals and insurance. Furthermore, Fujitsu will continue research on this platform and system for combining and connecting a wide variety of diverse data in the anticipation that it will also prove broadly useful in fields other than medicine, including manufacturing and finance.

This joint research project will not be limited to just evaluating technology, but through the use of real data, will also create genuinely effective and useful knowledge, giving back meaningful results to society.

Related Links

Department of Biomedical Data Intelligence, Human Health Science, Graduate School of Medicine, Kyoto University <http://clininfo.med.kyoto-u.ac.jp/en/>

Glossary and Notes

1. Bioinformatics researchers: Experts in bioinformatics, which fuses life science with information science, who analyze information relating to biological life and handle life science questions from a computational theory standpoint.

2. Cohort: A group used in researching topics such as the causes of disease by comparing the data obtained from following the group, consisting of people with certain elements in common, over a set period of time.

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About Fujitsu

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