Fujitsu Limited
Kyushu University
April 12, 2018

Fujitsu and Kyushu University Enter into Joint Research on AI in Agricultural Production

Supporting increasingly sophisticated and stable production based on a proprietary plant growth model

Tokyo and Fukuoka, Japan, April 12, 2018 – Kyushu University and Fujitsu Limited today announced that they will conduct joint research in the field of agriculture, for two years beginning April 2018, with the goal of increasing the stability and sophistication of agricultural production using artificial intelligence.

In this joint research, Fujitsu and Kyushu University will take plant growth status data, including plant height and the leaf surface area measured using Kyushu University's phytometric (*1) technology, and a proprietary plant growth model that integrates the spatiotemporal change data (*2) of plant theory, and integrate with a Fujitsu-developed AI engine able to predict information including growth rate and harvest periods, in real time.

The two organizations will also conduct R&D on systems that can bring about efficient plant cultivation, in line with demand, by regulating plant growth in the field based on these predictions.

Fujitsu will leverage the findings of this joint research in the Fujitsu Group's agriculture businesses, and together with an evaluation of effectiveness, it also aims to deliver new technologies as solutions to the agriculture industry. Kyushu University will offer education in smart agriculture, promoting dissemination of these results, together with human resource development.

Background

The stable supply of plant products and the improvement of revenue remain important issues in the field of agriculture.

Various factors, however, including good or bad weather and plant growing conditions at typical agricultural production sites, can make it difficult to flexibly supply such products that meet demand. Until now, know-how related to plant cultivation has often relied on the expertise of individual farmers, creating wide variability in the timing of the harvest and in yields and quality between individual farm fields. It has become essential to improve on-the-ground agricultural production in order to achieve consistency in terms of timing, yields, quality, and pricing.

Kyushu University and Fujitsu have been conducting joint research in the field of mathematics aimed at resolving issues in society since 2014. Now in new research, based in part using the results of earlier efforts, they are pursuing more stable and advanced agricultural production.

Summary of the Joint Research

Throughout the course of this joint research, Fujitsu and Kyushu University will incorporate Fujitsu's image processing technology, which features high recognition accuracy, into Kyushu University's alternative plant phytometric and assessment technology. In so doing, they will develop new technology that collects image data on crops using cameras and automatically measures different aspects showing the growth status of plants, including height, number of leaves, inter-nodal length, and stem diameter. Using Fujitsu's AI engine, which will combine this data with Kyushu University's plant growth model, this research additionally aims to make the optimal environmental conditions to ensure crop quality and the target harvest date, creating a system that regulates the environment according to crop growth status.

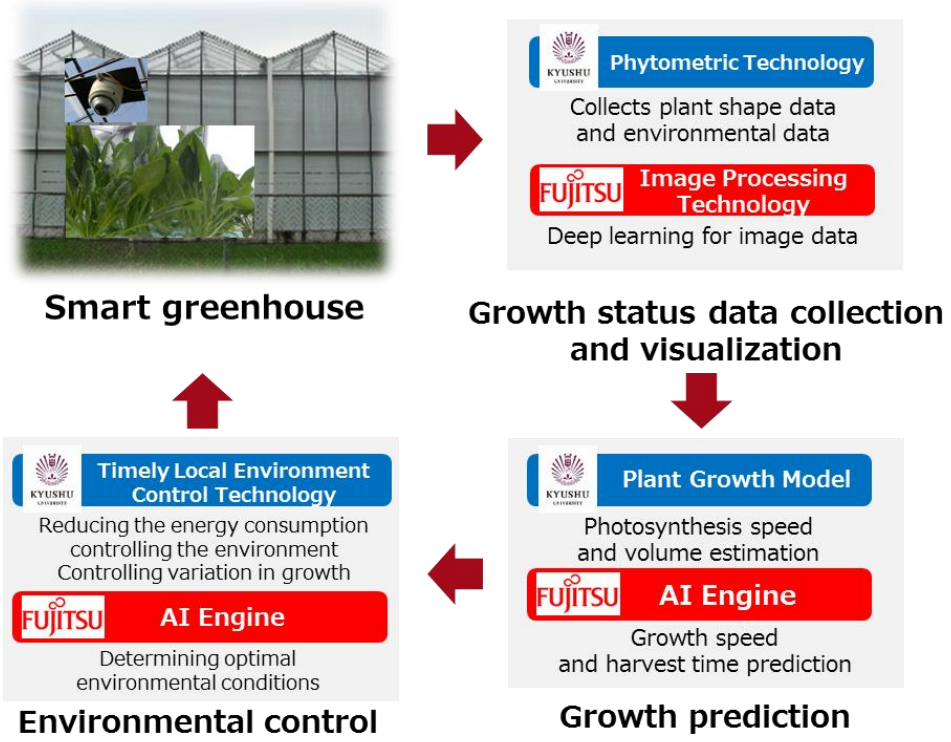

Figure: Diagram of the joint research project

1. Research period
April 2018-March 2020

2. Location
A smart greenhouse located on Kyushu University's Ito Campus, Fukuoka Japan

3. Roles and Responsibilities
Kyushu University:
Environment for plant growth as well as R&D, provision of phytometric data measurement technology
Conduct research aimed at applying the plant growth model to an actual environment
Conduct research and development aimed at applying technology that provides timely control of the local environment (*3) to an actual environment
Develop and implement a smart agriculture education program

Fujitsu:
Integrate the plant growth model into an AI engine
Plant feature quantity extraction and growth estimates using image processing technology as part of phytometric measurements
Predict plant growth speeds and harvest period using the AI engine and optimize environmental control
Create a system supporting plant cultivation that integrate the technological elements listed above

Future Developments
Using the results of this joint research, Fujitsu aims to deploy this technology in farm fields operated by Fujitsu Group companies in the agriculture business, and to make it commercially available as a solution aimed at the agriculture industry. In order to promote the use of ICT in the field of agriculture, Kyushu University will work to bring about smart agriculture, not only within Japan but also in the Asia region and other countries and will actively contribute to the nurturing of human resources.

Related Links
"Kyushu University and Fujitsu Establish Joint Research Unit on Mathematical Techniques for Use in Social System Design," (press release, September 12, 2014):
http://www.fujitsu.com/global/about/resources/news/press-releases/2014/0912-01.html

Glossary and Notes
1. Phytometric: Image diagnostic technology applied to leaf surface area or plant height. It also includes proprietary technology for the measurement of photosynthesis, evaporation, water absorption by roots, and conveyance of photosynthetic products (sugars) to fruits.

2. Spatiotemporal change data: Information on changes due to time and position or location. This case refers to information related to growth, such as photosynthesis and translocation within the plants.

3. Technology that provides timely control of the local environment: Technology to control the environment at a precise level, such as controlling the temperature of only a specific part of the plant for an appropriate length of time.

Press Contacts
Fujitsu Limited
Public and Investor Relations Division
Inquiries: https://www.fujitsu.com/global/about/resources/news/presscontacts/form/index.html

Public Relations Office, Kyushu University
MAIL:koho@jimu.kyushu-u.ac.jp
URL:http://www.kyushu-u.ac.jp

About Fujitsu
Fujitsu is the leading Japanese information and communication technology (ICT) company, offering a full range of technology products, solutions, and services. Approximately 155,000 Fujitsu people support customers in more than 100 countries. We use our experience and the power of ICT to shape the future of society with our customers. Fujitsu Limited (TSE: 6702) reported consolidated revenues of 4.5 trillion yen (US $40 billion) for the fiscal year ended March 31, 2017. For more information, please see http://www.fujitsu.com

About Kyushu University
Kyushu University is a comprehensive and one of the top research universities in Japan. The university is located in Fukuoka, which is historically renowned as Japan's gateway to Asia for profound cultural and economic interactions due to its geographical proximity to continental Asia.
Kyushu University is comprised of 12 undergraduate schools, 18 graduate schools, 17 faculties, 5 research institutes, University hospital and library, as well as over 50 affiliated research centers. It is recognized as an international university, it has an enrollment of about 20,000 students including more than 2,000 international students from over 100 countries. For more information, please visit its website http://www.kyushu-u.ac.jp/en/