

日時：2019年5月14日(火)17:15～
講義：アグリバイオインフォマティクス教育研究ユニット
フィールドインフォマティクス

ドローン画像を用いた植物の生育解析

郭威
東京大学大学院農学生命科学研究科
附属生態調和農学機構
国際フィールドフェノミクス研究拠点

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1

Useful Information

- Github page for today's lecture (<https://github.com/ocean/DroneImgLecture>)

Agenda

- Brainstorming
- Review of case studies.
- Demo and current issues.
- Proposal for an “Image challenge for field plant phenotyping”.

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2

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About us

Topics:
 • Image based phenotyping, Field sensing(IoT, Robots), Agri-Big data
 Member:
 • Prof. Ninomiya; Prof. Hirafuji; Asst. Prof. Guo; Dr. Mu;
 • Students from France, Indian, China and U.S.

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3

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Plant Phenotyping in different scale

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4

Are you ready ?

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Are you Ready?

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5

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Tell me about your Background

7

15

16

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Drone for agriculture



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- 精密農業 (Precision Agriculture)
- スマート農業 (Smart Agriculture)
- デジタルファーミング (Digital Farming)
- 育種産業 (Breeding industry)
- Looking for your thoughts (report)

8

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How will you use the Drones?

16

16

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9

Hardware, Core Technologies and Policy



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- Hardware
- Core Technologies
 - Flight control
 - Data collection
 - Data analysis
 - 3D reconstruction and Field Mapping
 - Plot/Region segmentation
 - Target detection/identification/recognition
- Public Policy over the world

10

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Data collection



RGB/Modified RGB Thermal multispectral hyperspectral Lidar

11

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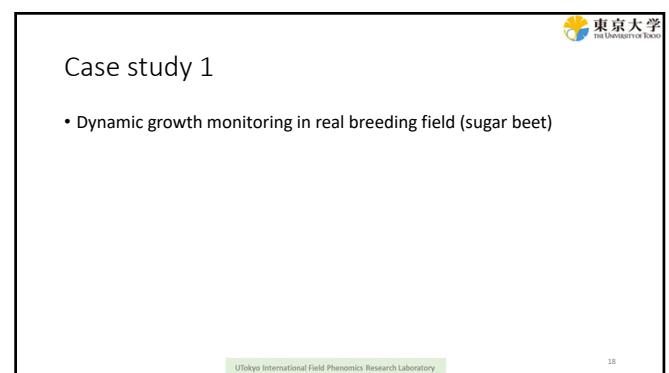
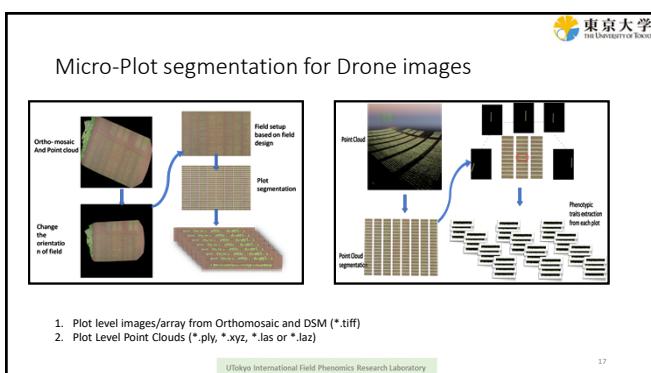
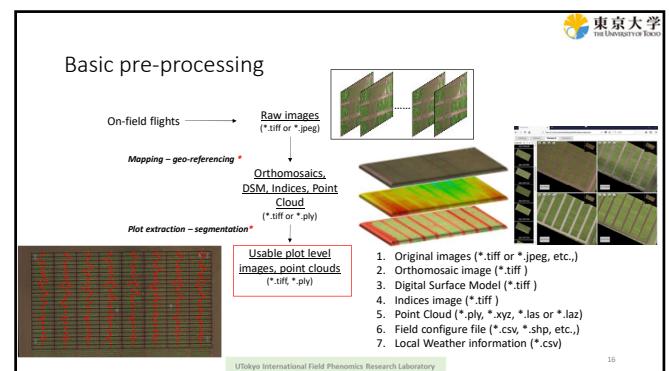
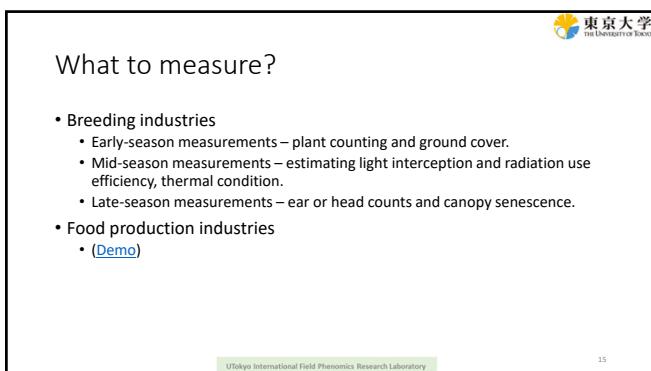
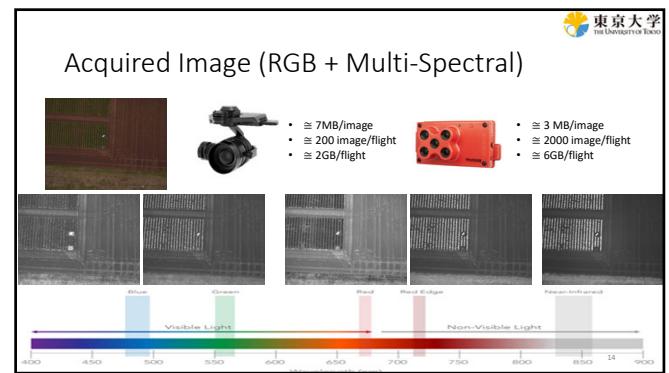
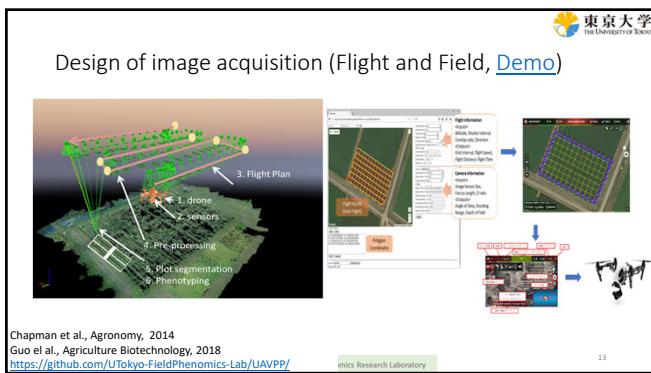
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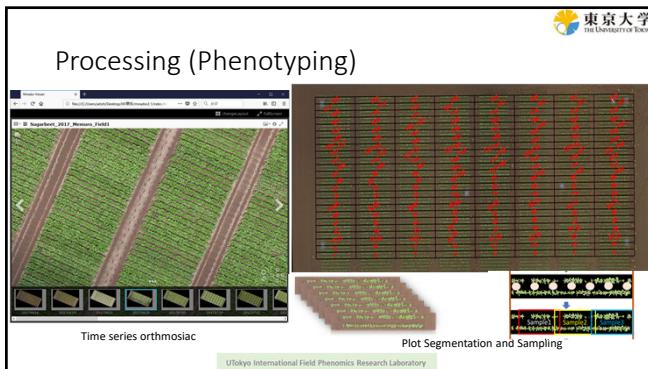
Data collection



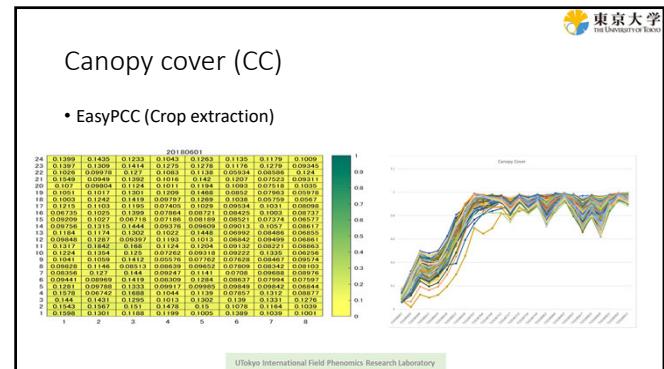
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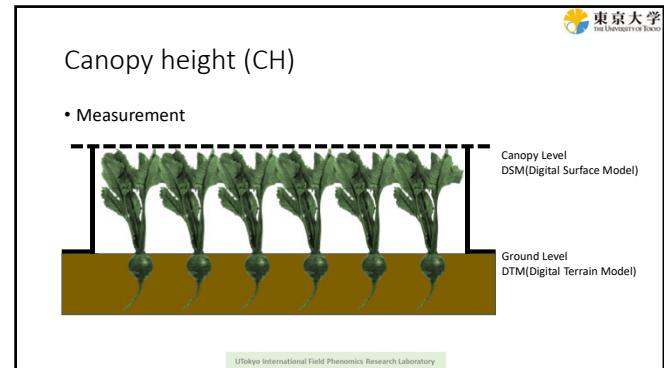
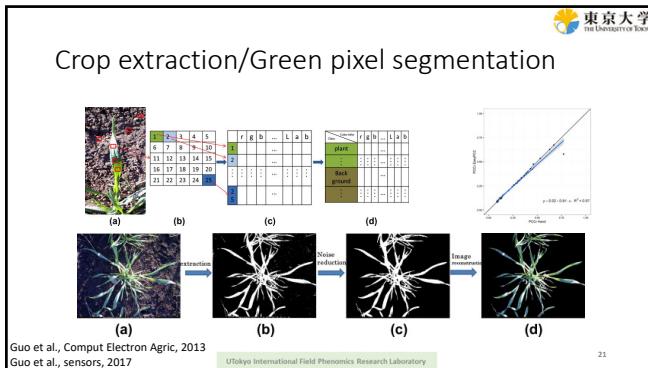




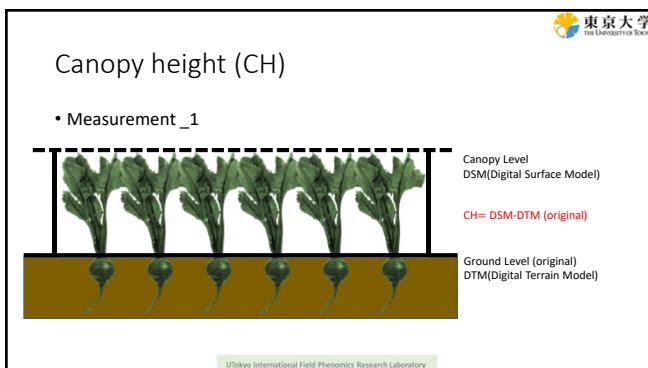
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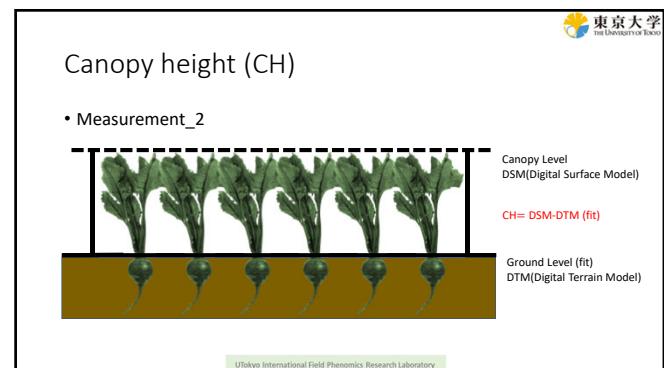
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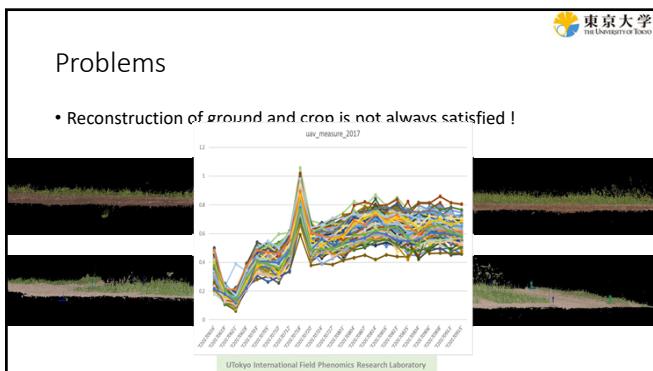
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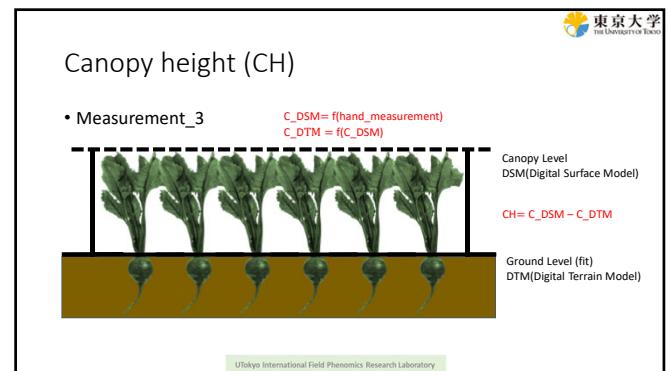
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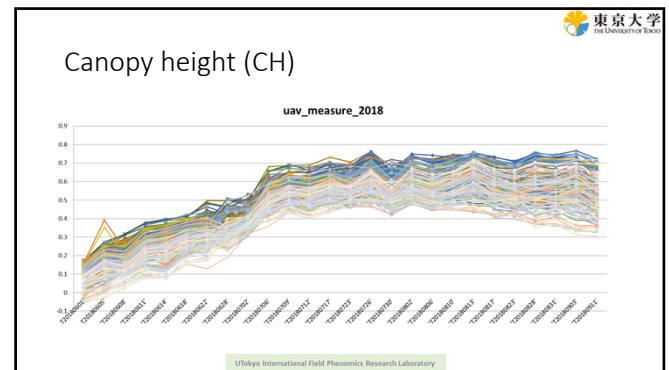
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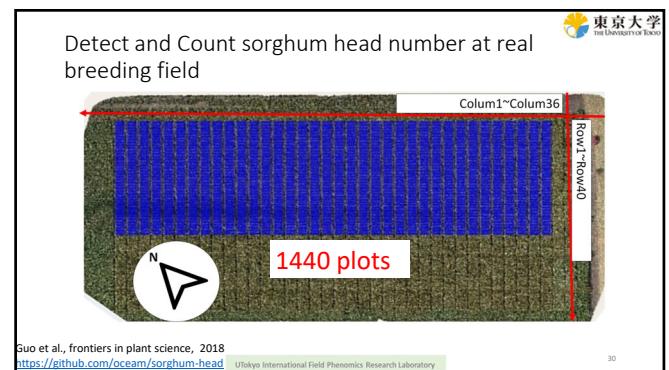
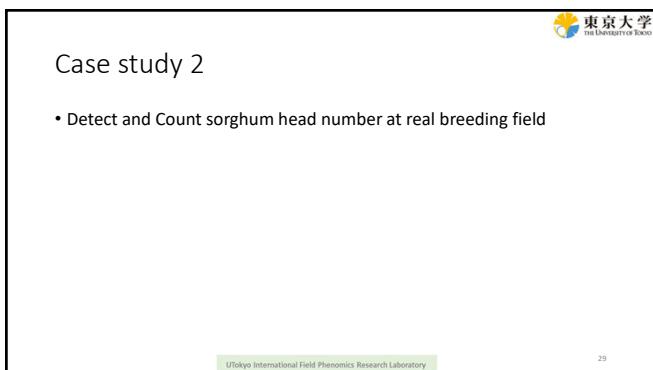
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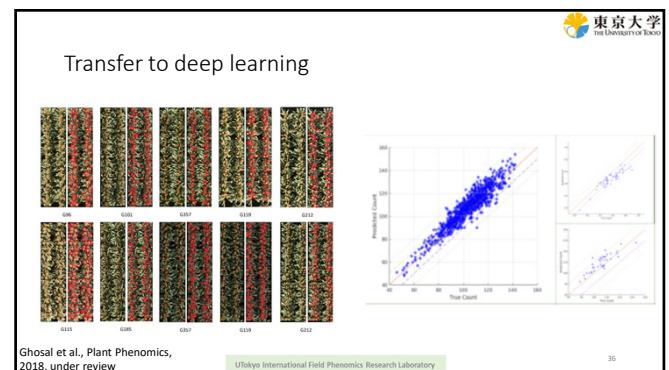
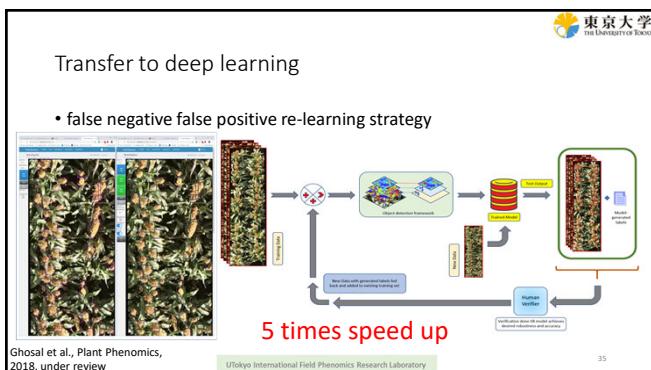
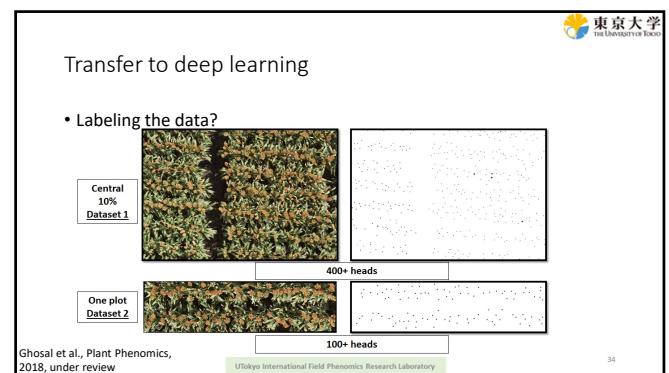
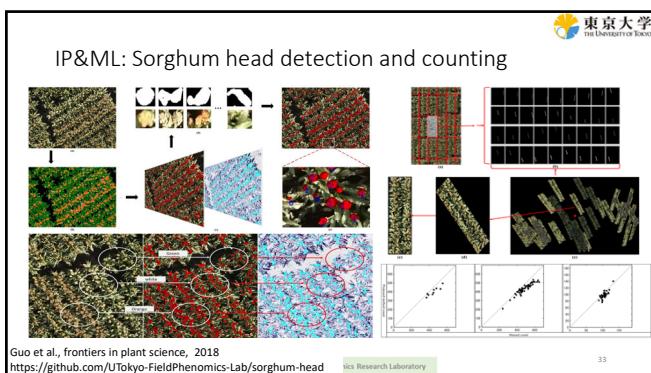
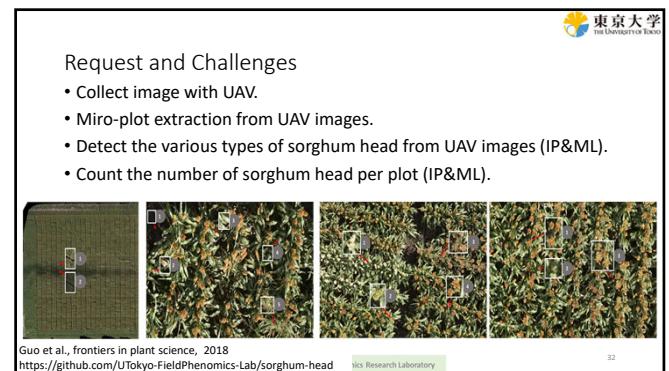
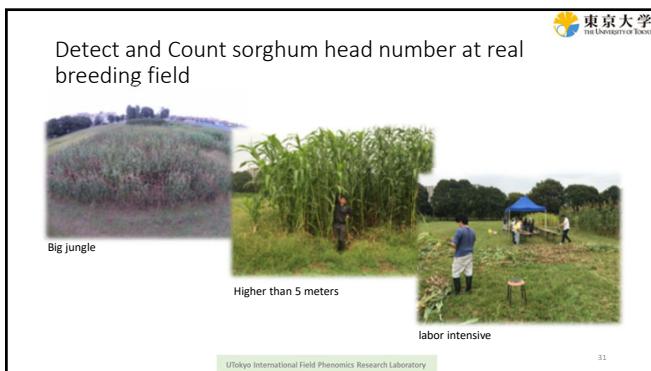
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28



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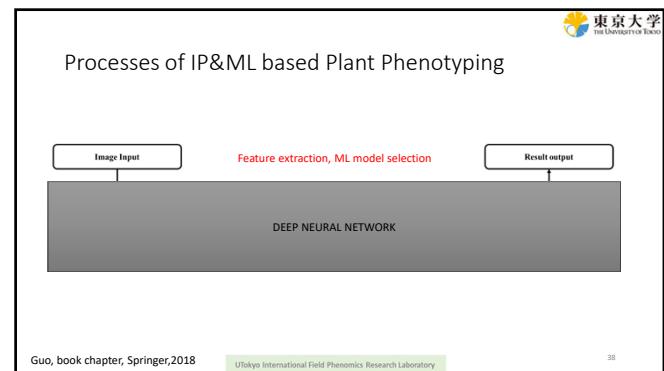


DEMO

- UAVPP, Breeder-Friendly-Plant-Phenotyping-tools for UAV, Wiki page
- (<https://github.com/UTokyo-FieldPhenomics-Lab/UAVPP>)

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37



38

Current issues

- Multispectral image alignment
- 3D reconstruction

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39

Public Policy over the world (online check)

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Do you want to try it by yourself?

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41

Image challenge for field plant phenotyping

- Increase the Accuracy
- Increase the efficiency of training data collection
 - Given an image, can we guide to the most needed target to be labeled (most efficient bounding box) and left the others to be labeled automatically?
 - Given a dataset, can we tell which are the best need to be annotated?

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42

Image challenge for field plant phenotyping

Corroborators:

- France: Dr. Fred Baret, Dr. Simon Madec (INRA)
- Australia: Dr. Scott C Chapman (UQ, CSIRO)
- U.S.: Dr. Baskar Ganapathysubramanian, Dr. Soumik Sarkar (Iowa State University)
- Japan: Dr. Yuko Ozasa (Keio University)

Call for participates!

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43

Question time

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Questions?

デジタル農業しやすい農法研究はありますか？
agroecologyへの応用開拓はありますか？
セド王芋で農業の課題解決に取り組んでいます
ラベリング系の画像のデータセットとかでパブリックな
育種の発展でその出版規則をドローンで行かなければ
データを出せばいいのかどうかなどありますか？
レポートに書くべきことなどありますか？

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7

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44



45