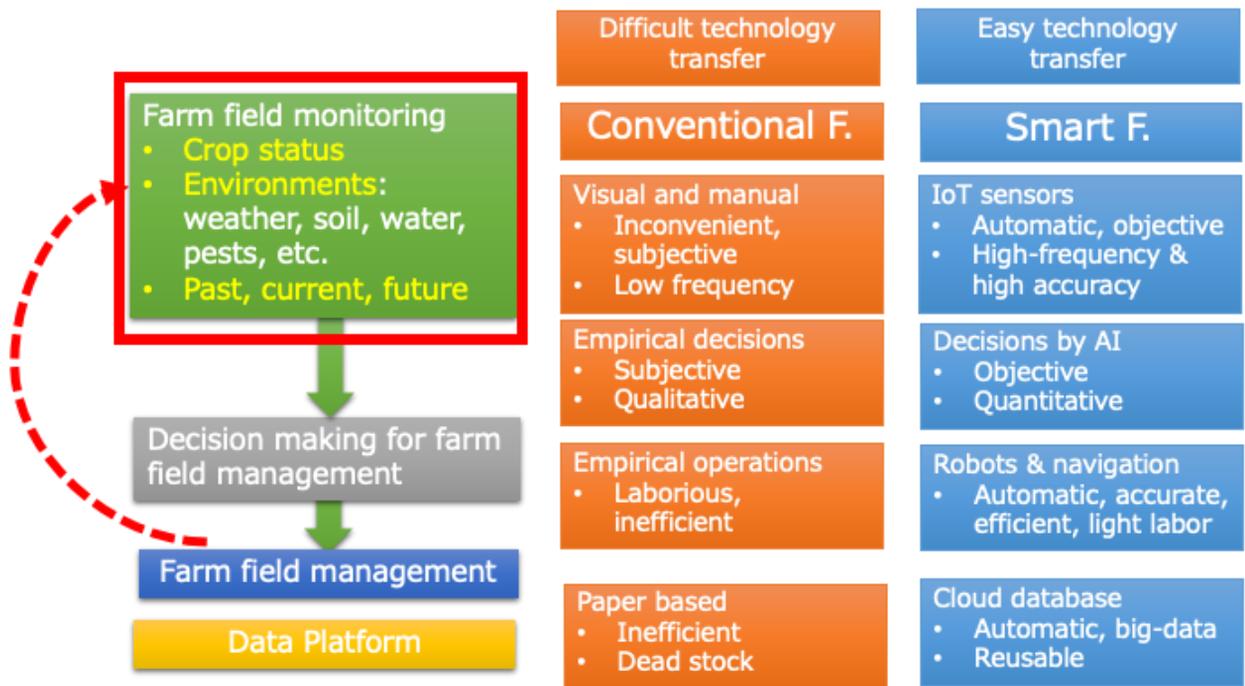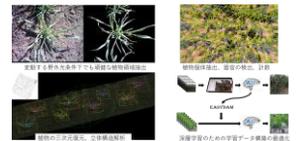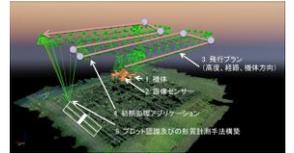# Wei GUO   Associate Professor

Institute for Sustainable Agro-ecosystem Services (ISAS)
Department of Agricultural and Environmental Biology

Research Topics

- Development of field Sensing techniques and facilities.
  （Applied research）
  - IOT, Robotics, UAVs
- Development of phenotyping algorithms and applications.
  （Basic + Applied research）
  - Crop growth monitoring
  - Crop organ detection
  - Crop/tree 3D reconstruction and analyzing
- Development of phenotyping Pipeline, System, protype.
  (Experimental development)
  - Collaboration with Local government/institute
  - Collaboration with Private Company
  - Startup projects

Difficult technology transfer	Easy technology transfer
Conventional F.	**Smart F.**
Visual and manual • Inconvenient, subjective • Low frequency	IoT sensors • Automatic, objective • High-frequency & high accuracy
Empirical decisions • Subjective • Qualitative	Decisions by AI • Objective • Quantitative
Empirical operations • Laborious, inefficient	Robots & navigation • Automatic, accurate, efficient, light labor
Paper based • Inefficient • Dead stock	Cloud database • Automatic, big-data • Reusable

Farm field monitoring
- Crop status
- Environments: weather, soil, water, pests, etc.
- Past, current, future

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Decision making for farm field management

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Farm field management

Data Platform

Research goals

We are developing algorithms and applications for high throughput and high precision evaluation of the growth and performance of organisms from the cellular level to the population level, using image pattern recognition, machine learning, and sensing technologies. We will also contribute to accelerating the social implementation of such new technologies in actual agricultural fields.