Towards a Software-Defined Farm

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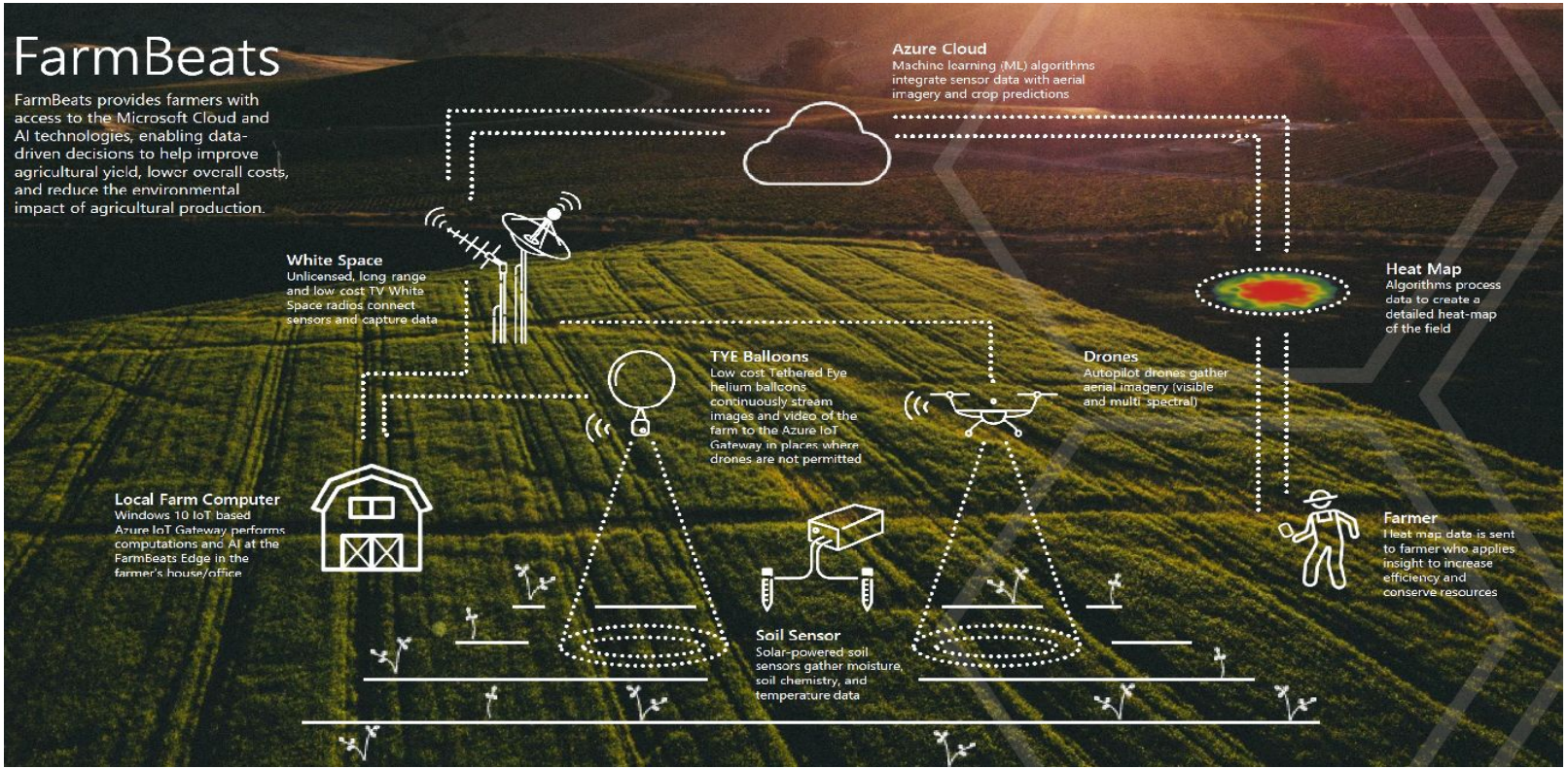
Feeding 10 billion in 2050: Man vs Machine

- Increase agricultural total factor productivity (TFP)
  - …. by 2% per year from 1.5%?
- Reduce crop loss to env stress, disease, insects, etc
  - … by 20%
- Improve water-N-P use efficiency
  - …. by 50%

Cornell Institute for Digital Agriculture

Feeding 10 billion in 2050: Man vs Machine



Research Questions

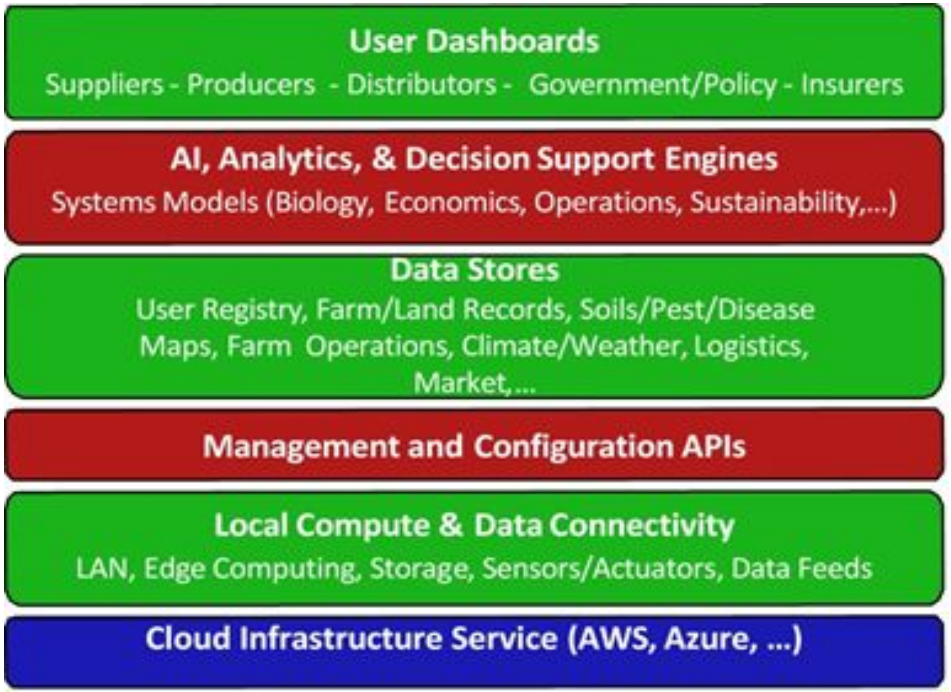
1. What are the right abstractions to underpin innovation in digital agriculture?
2. Is it possible to innovate while keeping IoT platforms equitable?

Roadmap

- Technical approach
  - Software-Defined Farm
- Social approach

Towards a Software-Defined Farm (SDF)

Sense + Data + Comm + Cloud + Analytics + Actuation = SDF



Off-farm Service providers

Data prioritization

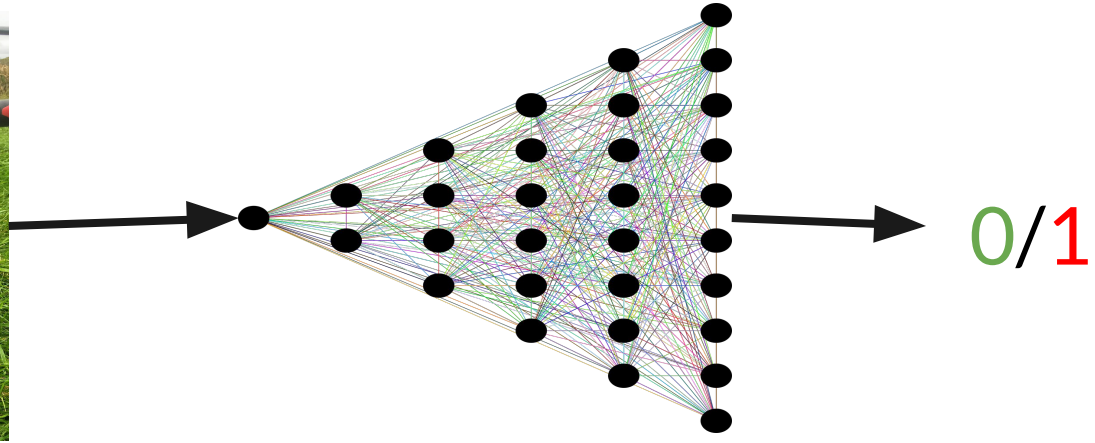
Data diversity

Easily adaptable software templates

FarmBeats

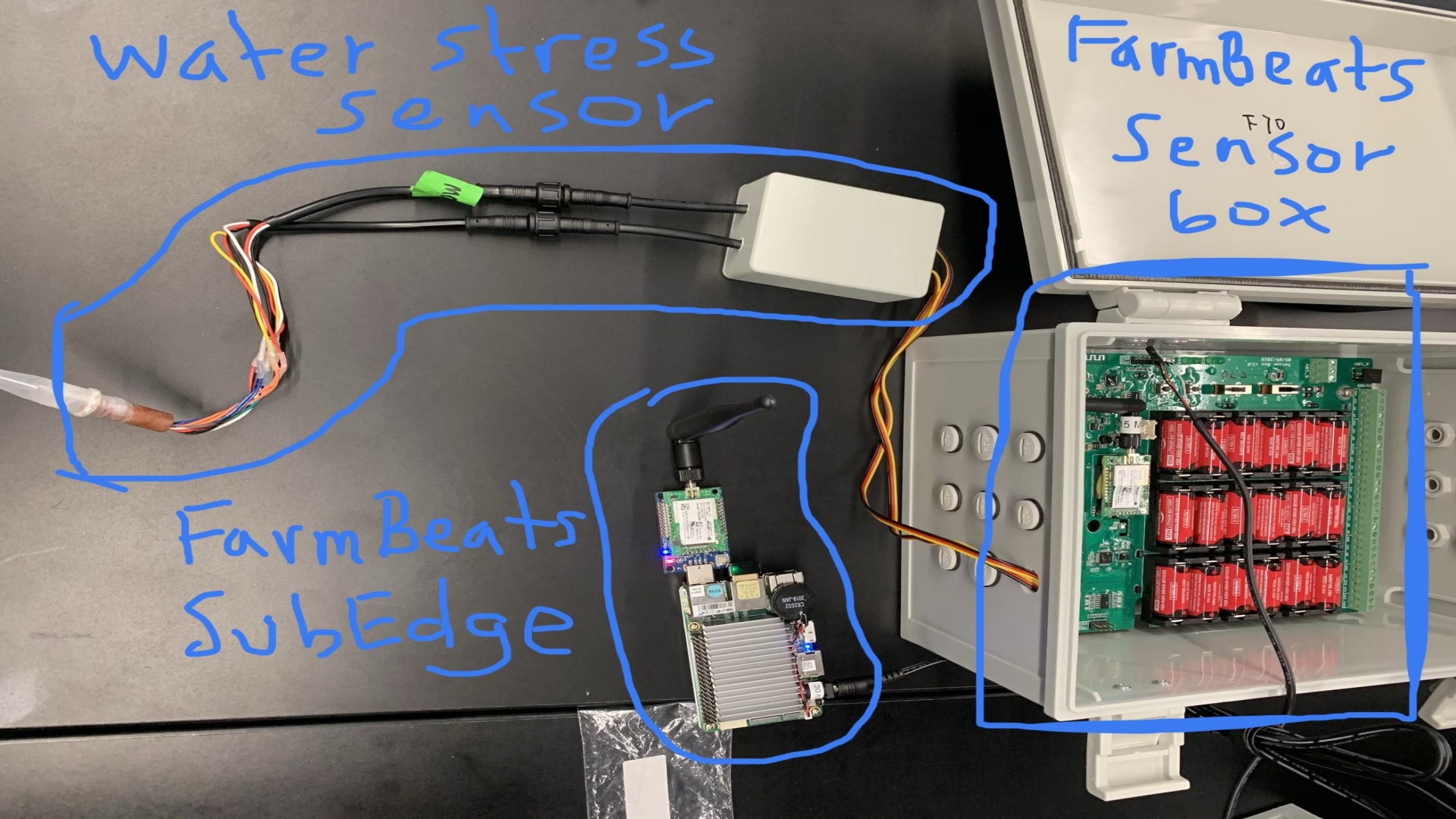
Mike Gore Lab:
Identifying Northern Corn Leaf Blight

Identifying Northern Corn Leaf Blight (NCLB)

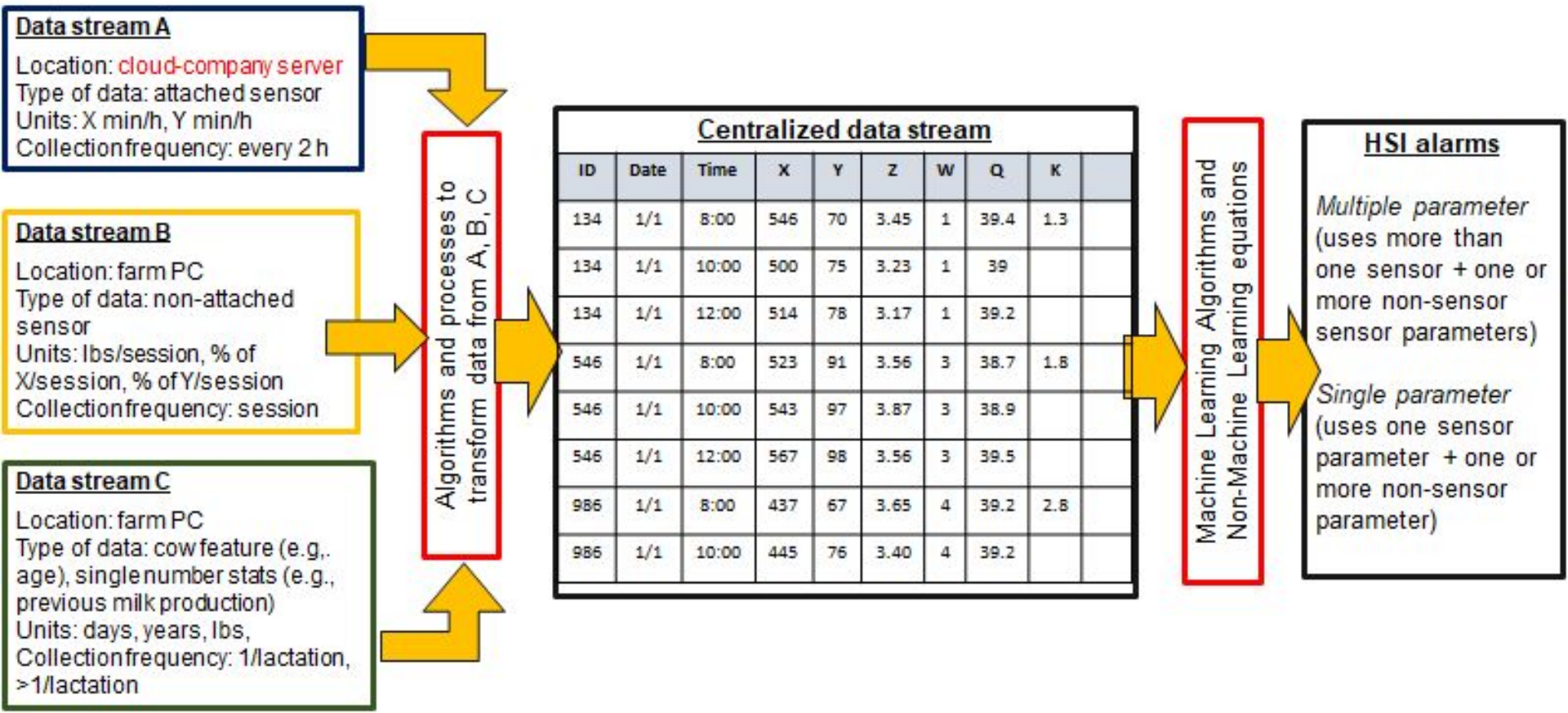


https://pixabay.com/vectors/neural-network-thought-mind-mental-3816319/

Abe Stroock Lab:
Modeling Plant Water Stress


Water stress sensor
FarmBeats Sensor box
FarmBeats SubEdge

Data Management & Processing Plan



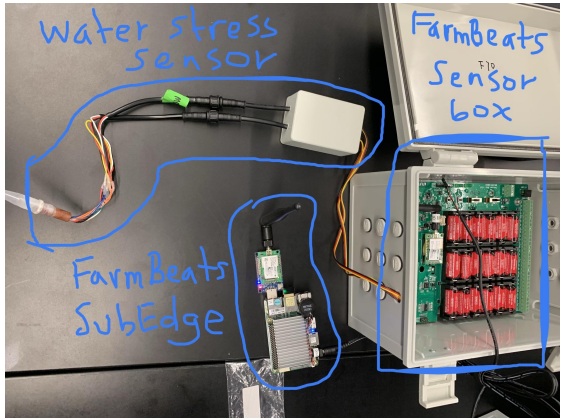
Roadmap

- Technical approach
  - Software Defined Farm
- Social approach

Social Approach

Conclusion

Reduce loss from disease



Water use efficiency

Increase productivity

https://pixabay.com/illustrations/farm-farm-pack-farm-set-farmer-1084225/

Sources

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