Group 7: Machine Learning

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Where we are:
- For detection of key plant structures, we seem to be getting close to systems that work.
  - Identifying fruits, flowers, etc.
- Taxonomy identification

Where we are going:
- Moving from image classification to object detection and localization (and more)
  - bounding boxes
  - precise segmentation
  - attentions model
  - counting networks
- How many images do you need to answer your question? Note that evenness of sampling across phenological states and species is critical.
- Transfer learning: better understand the generalization across species / collections (how many more data to annotate?)
- Methods for reliable information about ambiguity/accuracy of individual scorings (active learning)
- Causal inference, decision explanation
- Possible systematic error propagation that could impact studies built on top of the data automatically annotated
- Cost/benefit analyses: When does it make sense to invest effort in developing ML systems? When does it make sense to use other approaches (e.g., citizen science)?