# Auburn USDA CS Liaison Meeting Agenda

**Date:** 13 March 2025

**Zoom Info:**

* <https://hmc-edu.zoom.us/j/91402147478?pwd=bau13Kp335ceA9YCc3AApWyI5eH6rD.1>
* Meeting ID: 914 0214 7478
* Passcode: CLINIC2025

**Meeting Goals**

* Demonstrate progress towards goals
* Get clarification on data augmentation reasonableness

**Agenda**

* Logistics
  + Next week is Spring Break, no meeting.
  + Spring Presentation [Zach]
    - We will send a draft of our slides by EOD, but note that we have very limited time to implement any feedback.
* Progress Updates
  + New GUI features [Mehrezat & Devanshi]
  + Data Augmentation [Lillian]
    - We want feedback on how reasonable some of these augmentations look.
  + UNet [Milo]
  + Transformer Model [Zach]
  + Hyperparameter Tuning [Zach]

**Assigned Notetaker:** Devanshi (Milo Backup)

**Minutes:**

Dr. Backus: Engineering team trip recap

* The engineering team was successful.
* By Friday evening, they were able to get everything working.
* (Their) next steps:
  + Rectify depth issues related to aphid potential drops.
  + Reduce clunky size.
  + Computer software was non-functional—they need to work with last year’s display software.
* They may take a second trip to Parlier for testing.

Zach: General debrief for our site visit last week: successful.

Logistics:

* Next week is spring break.
* Only a few weeks remain in the clinic program.
* We’re working on our final presentation—no feedback expected on content, but we will pass the visual materials to you.
* We will also provide a recorded version for you to share with higher-ups.

New GUI Features:

Mehrezat: Work is on hold due to the upcoming presentation, but label durations are next on the list to be implemented.

Devanshi: Working on a scroll bar and rule augmented HMM.

Lillian: Focused on data augmentation. By next time, she aims to show plots and determine the most effective methods.

Zach: Once plots are ready, we will run it by you liaisons.

UNet:

Milo:

* Making minor fixes to the UNet to improve functionality.
* Implementing slightly larger changes to UNet structures and new features to enhance data visibility.
* Expecting a small performance boost.

Zach:

We had previously discussed using a transformer model.

Comparison:

* CNN looks at individual time steps and integrates information layer by layer, but has limitations.
* Transformers compare every time step with every other time step.

Results:

* Initial performance is on par with other models.
* We will evaluate improvements through hyperparameter tuning.

Our Aim: Identify optimal settings and determine the best possible outcome with the dataset.

Other than that, updates are minimal due to the upcoming presentation.

Dr. Backus:

Unfortunately, none of us can attend Project Day due to federal travel and outreach funding restrictions at many universities.

We will review presentations remotely.

Zach:

No worries—you mentioned this at the site visit.

Devanshi:

Translating the Wu paper.

Zach:

We already use these techniques, and they don’t seem particularly novel.

Any performance differences may be due to a data-rich environment.

Dr. Backus:

They are successful, but the question is whether we can achieve similar results for insects.

Zach:

Data has a snowball effect—the amount continues to grow.

Dr. Backus:

How similar is your program to Fenming’s?

Zach:

Similar process, no novel methods—follows standard protocol.

Dr. Backus:

His program is the only one that works at scale and is widely used.

Zach:

Having 40 labs using it helps accelerate improvements.

Dr. Backus:

We will likely start with 10 labs and expand based on hardware availability.

By the end of the semester, will you have a mosquito-compatible program?

Will the training program incorporate new species for other arthropods?

Zach:

We might have to wait until summer interns can support the ML training facilities for you as entomologists to be able to facilitate this kind of acceleration.

Devanshi:

Translated the paper—will include it today’s email, as well as the facility to be able to read such papers.

Prof. Hope:

Asked about generating data.

Devanshi:

Not augmentation—they apply transformations, essentially an FFT.

Zach: Thanks everyone. See you after spring break.

Dr Backus: Great meeting everyone. Get some rest.