**Introduction**

- Ruminant animals are commonly housed and fed in groups, making individual intake measurements challenging.
- Individual intake information will provide insight on health and productivity, allowing for individual management of animals.
- Stereo vision, coupled with on-going complementary efforts to identify individual animals, may provide volume estimates of feed across time.

**Objective**

- Estimate the volume of feed offered to dairy cattle across time to enable per-bout intake of feed throughout the day.

**Open3D (Point-Cloud)**

1. Create Point-Cloud
2. Manually select region
3. Find barn floor (RANSAC)
4. Floor Point-Cloud
5. Feed Point-Cloud
6. Form triangular mesh
7. Estimate Volume from mesh

**Approach**

- RGB Stereo Camera
- Estimation 3D geometry of the feed pile(s) using 3D triangular mesh

**Experiments**

- Two types of feed
- Different pile shapes
- Different lighting scenarios

**Future Work**

- Feed composition analysis
- Integration to video streaming
- Cow presence detection

**Results**

![Linear Regression Fit for Manual Measurement](image)

**Authors**

Prajwal Rao*, McKinley Flinders*, Dr. Amy Reibman§1, Dr. Jacquelyn Boerman§2

*Graduate Student; §Advisor

1 Department of Electrical and Computer Engineering, Purdue University, West Lafayette, IN 47907
2 Department of Animal Sciences, Purdue University, West Lafayette, IN 47907

**Acknowledgements**

This research was supported by Purdue University’s Colleges of Agriculture and Engineering Collaborative Projects Program 2022. This research was also supported by a NIFA/AFRI IDEAS grant.