Per-Cow Intake Monitoring Using Stereo Vision

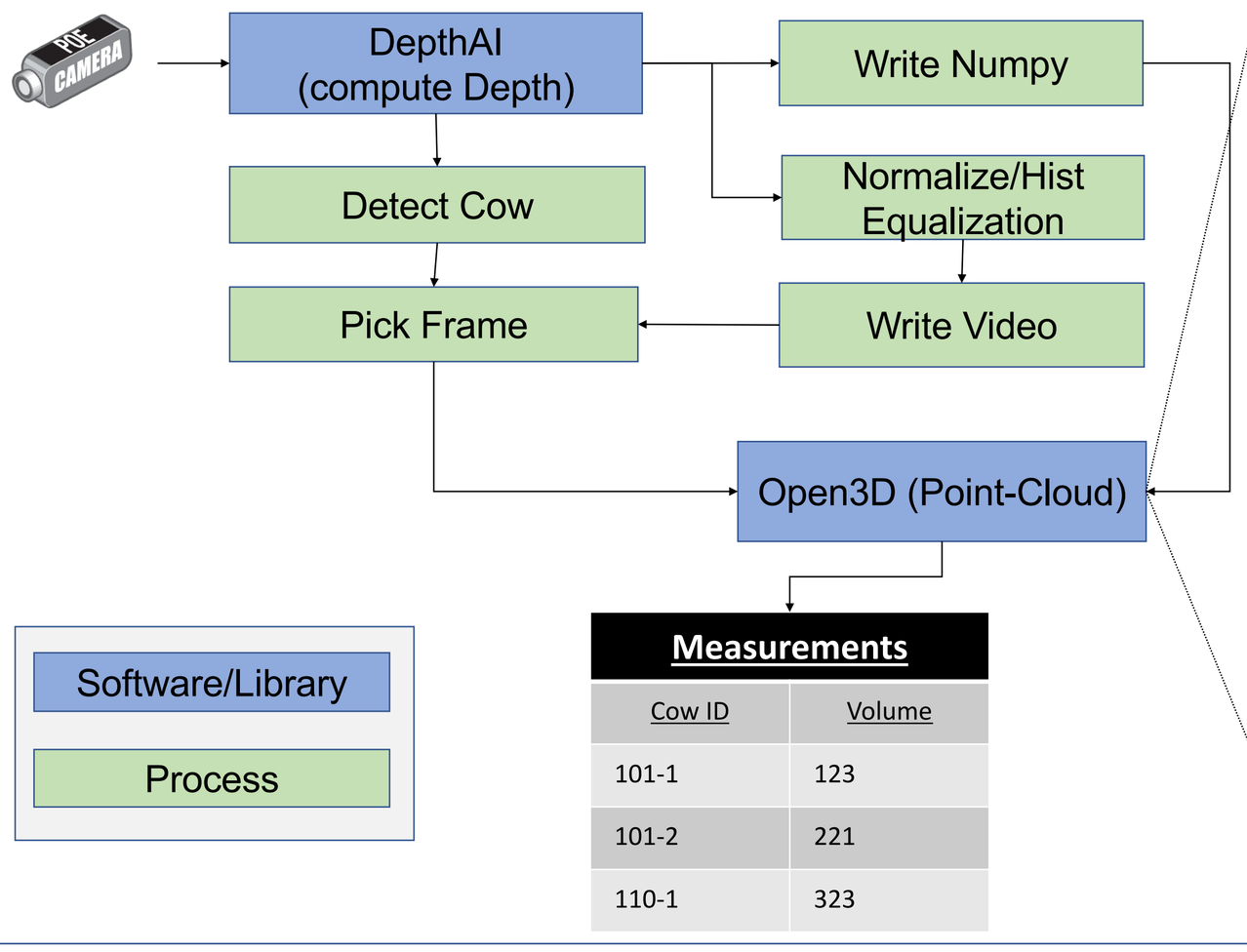
Introduction

- 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

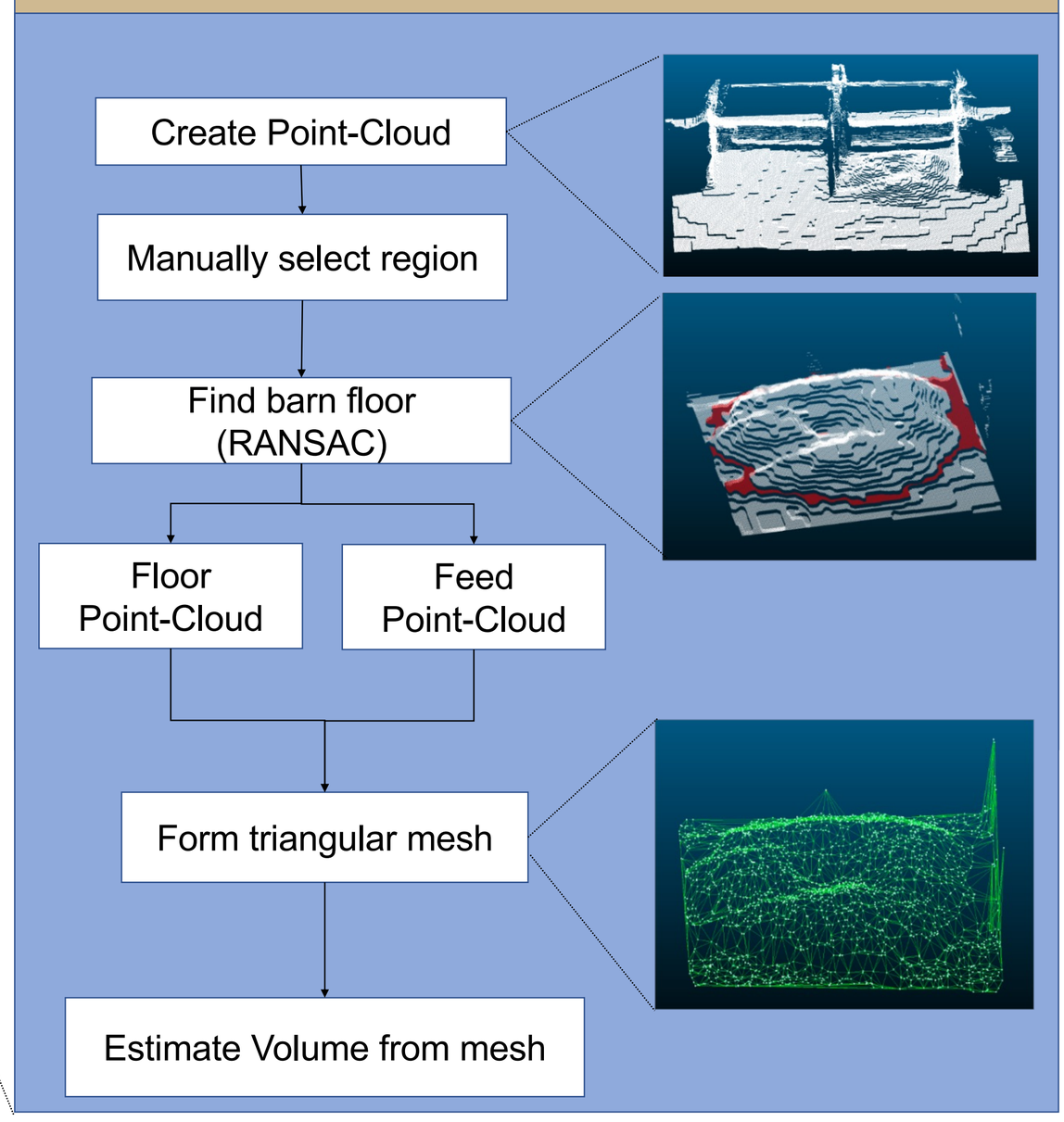
Overall Architecture



Measurements

Cow ID	Volume
101-1	123
101-2	221
110-1	323

Open3D (Point-Cloud)



Approach

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

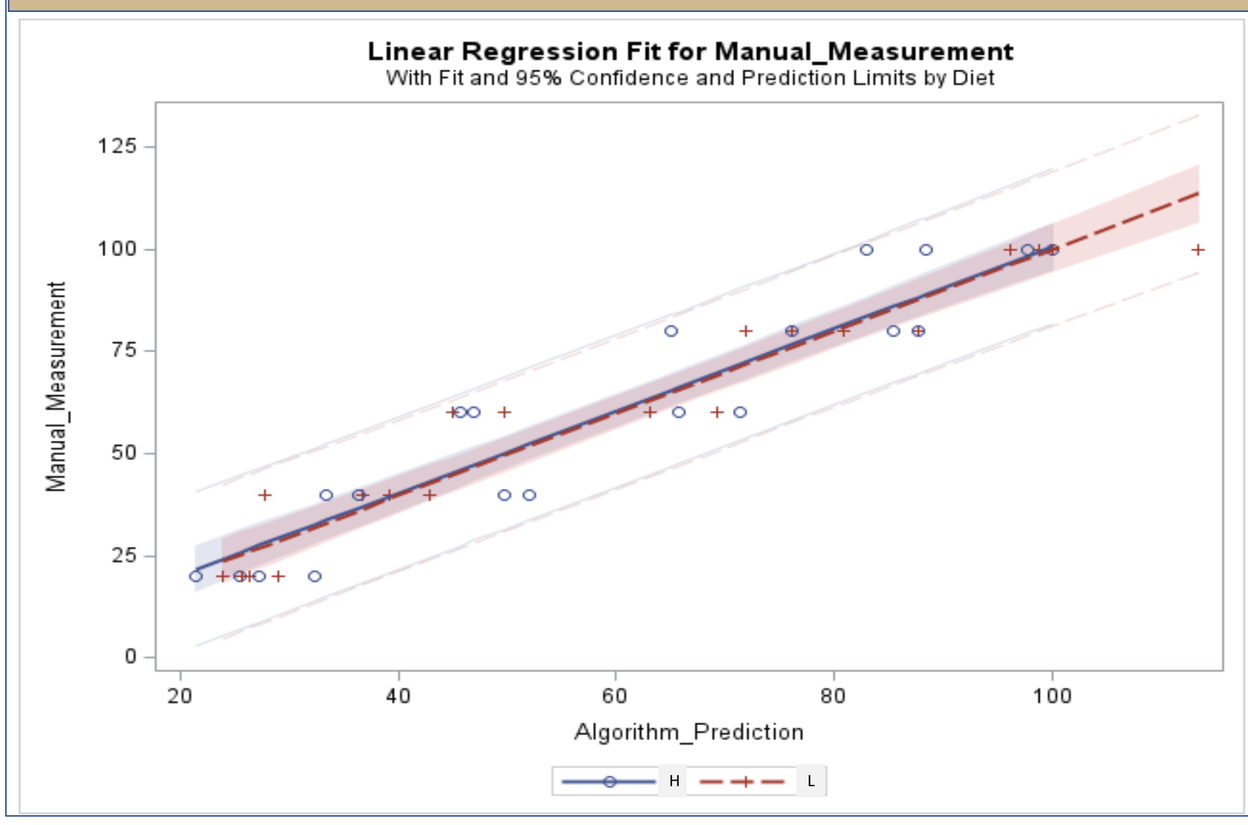
Experiments

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

Future Work

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

Results



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NIFA: National Institute for Food and Agriculture
AFRI: The Agriculture and Food Research Initiative
IDEAS: Inter-Disciplinary Engagement in Animal Systems