



Validating CowView

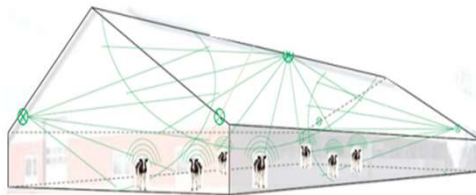
Comparing automatic classification of cow activity to human observers

Introduction

- Farmers and SLU researchers want to monitor social interaction and disease spread.
- Software classifies the the cow as performing one of 6 activities based on positional data.
- Cows were observed while eating and resting by researchers at SLU.
- This study validates the software's classifications using human observations.



Cows wear radio senders which communicate their position to receivers in the ceiling.



Conclusions

- High true positive rate at the feeding table.
- Many false positives as 155 of 171 periods of feeding started earlier AND ended later in CowView than in the observers notes.
- To improve, first determine if programmed position of the feeding table or CowView filters are to blame
- 0 out of 20 cubicle periods were spanned by the observer period in the same way
- However, cubicle periods had a lower true positive.
- Potential filters are discussed in the report.

Method

- Notes made by observers were cleaned and entered into a database with Python scripts.
- The periods of time when the activity of a cow was known were matched with CowView classifications from the same period.
- The true positive rate was calculated as the percentage of seconds when the system agrees with human observers.
- 45 cows performing 191 activities were observed.

Case studies

3 case studies of video of were performed of situations identified in the database:

- A cow observed eating uninterrupted
- A cow observed eating with many interruptions
- A cow observed to be in a cubicle uninterrupted but classified as repeatedly leaving and entering by CowView.

	True positive	#Cows	#Periods
Feed	90.4%	32	171
Cubicle	83.7%	15	20