乳牛牛蹄照護機器人需求

Needs of Robots for Hoof Caring of Dairy Cattle

報告人：曹全偉技佐、吳明哲組長
Mr. Chaun-Wei Tsao & Mr. Ming-Che Wu
Taiwan Livestock Research Institute

Problems Description

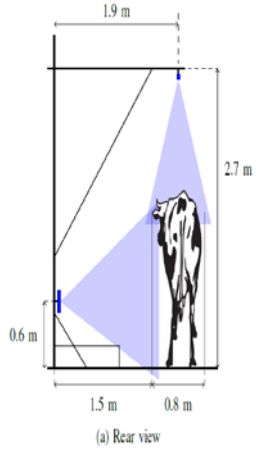
- An important factor contributing to milk production is the amount of water consumed by cows.
- Whenever the hoof of the cow suffers from hoof disease, it will cause the milking cow to reduce the walking behavior in order to avoid the pain.
- The milk production of milking cow will be seriously affected by hoof disease.

Current ways to prevent hoof disease

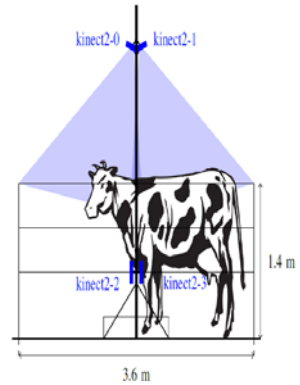
- Regular manual inspections.
- Spraying disinfectant when milking.
- Cleaning the cowshed with compact frequency.
- Using sawdust or rubber pad.
- Regular hoof repair job.

Current technique to prevent hoof disease

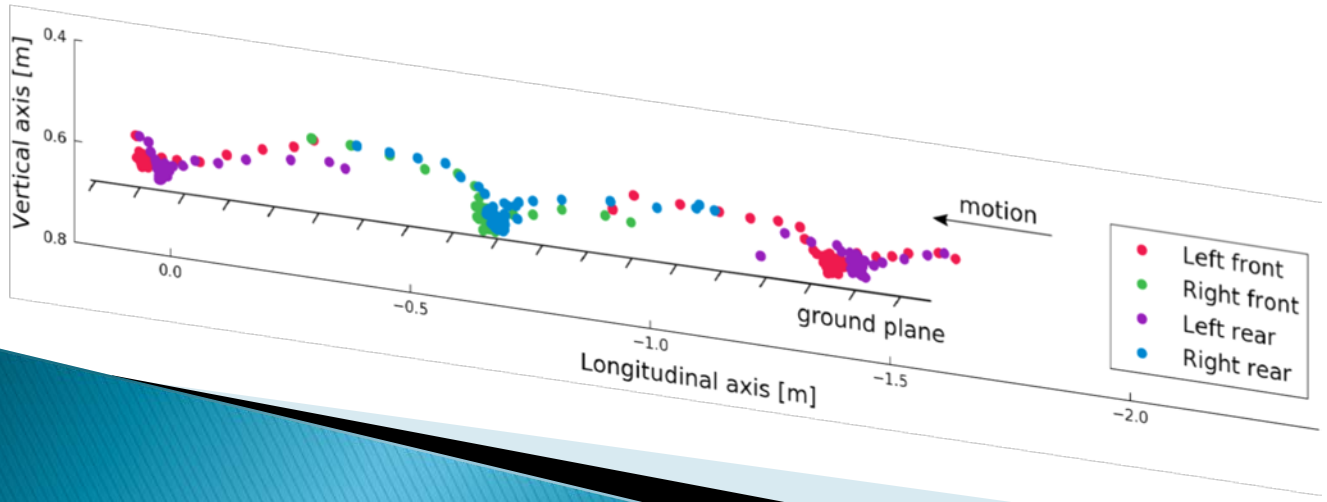
- Using a Region based Convolutional Neural Network framework(R-CNN) to build model for recognizing carpal/tarsal joints and hooves.
- Using four 3D sensors record cattle passing through for hoof tracking.
- According tracking result to detect the lame cows.

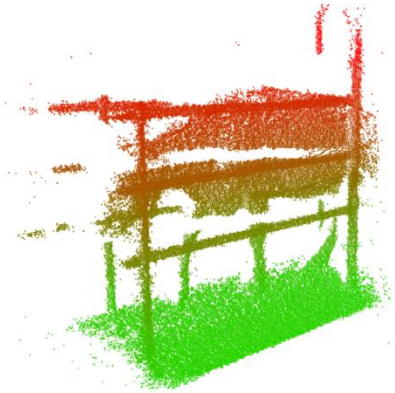


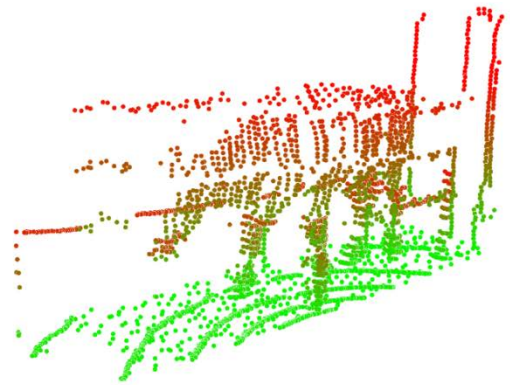
(a) Rear view



(b) Side view




(a) Kinect-v2 ToF (81452 points)


(b) 64 line + 16 line LiDAR (3679 points)

Current technique to prevent hoof disease

Our Needs of Robots for Hoof Caring

Robot ?
Hoof Care?

Sort

Inspect

Cure

Expected Benefits

- Improving animal welfare and economic performance.
- Reducing the labor involved.
- Automatic lameness detection could provide an objective, consistent lameness assessment.
- Reducing lameness in dairy farms, especially for dry cows and young female cows.
- Decreasing the monetary losses of lameness.

~Thank You~