Snapshot report

Fingerprinting

Digital fingerprinting for primals back to carcases

Project code
2024-1074

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Project description

This project's intent is to perform initial beef validation on a AI solution that would allow for beef primals to be tracked by Carcass ID, without cumbersome changes to production environments. Traceability after carcass breakdown is a key industry need. Currently, once a carcass is broken down beyond quarters it is not practical to track and trace pieces, as this would require physical labels on every piece, which adds substantial complexity to systems, along with foreign body and quality concerns.

Project content

This project intends to prove the core technology associated with a solution to this traceability problem, developed by FloVision Solutions. This solution is referred to as "Fingerprinting", where a unique "fingerprint" of each object can be scanned and matched together, analogous to human fingerprint analysis or facial recognition. This project will focus on Striploin primals and ensuring they can be traced from quarter, when a physical label is still present and could be read, to post trimming, when the primal is about to be packaged and a label could easily be printed for further traceability.

5 batches of data were gathered across 3 production days. A variety of data augmentations and algorithm iterations were tested to optimize the Fingerprinting solution. Following these, all the data was processed and the Fingerprinting AI ran an exhaustive matching process, attempting to match every DC1 (Data Collection Point 1) image with every DC2 (Data Collection Point 2) image for that batch. DC1 was located before the chiller, when the meat is in quarters. DC2 was located between striploin trimming and packing. A total of 66,366 unique pairs of images were gathered to be assessed.

Project outcome

5 batches of striploin data were analysed. Batch information is shown in the below table.

Batch	DC1 Images	DC2 Images	Total Number of Pairs	Positive Pairs	False Positives	Missed Pairs
Batch A	88	99	8,712	37	0	~0
Batch B	74	128	9,472	30	0	~0
Batch C	65	114	7,410	41	0	~0
Batch D	157	179	28,103	79	0	~0
Batch E	103	123	12,669	15	0	~0

It can be concluded that the Fingerprinting test resulted in approximately 100% accuracy, certainly well above the targeted 95% outlined in the project objectives. There were 0% false positives, beating the 1% target outlined in the project objectives.

Benefit for industry

If a reliable solution can be validated that can trace primals back to their carcass, without substantial infrastructure and procedure change, this unlocks huge value in yield, genetics, quality control, recall efficiency, etc.