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# Detecting social interactions between cows

## Background

Dairy cows are very social animals that frequently interact with their peers. These interactions can be both hostile and friendly. Friendly interactions can include allogrooming while hostile behaviour includes kicking or headbutting. Hostile interactions can in many cases lead to displacement of the recipient where the aggressor takes the recipient's place.

The goal of the project is to develop tools for summarizing animal movement and social interactions on dairy farms.

## Data

The data used was collected through CowView which is a tool developed by GEA Systems. Each cow is fitted with a radio transmitter or tag and several receivers are mounted on different places in the barn.

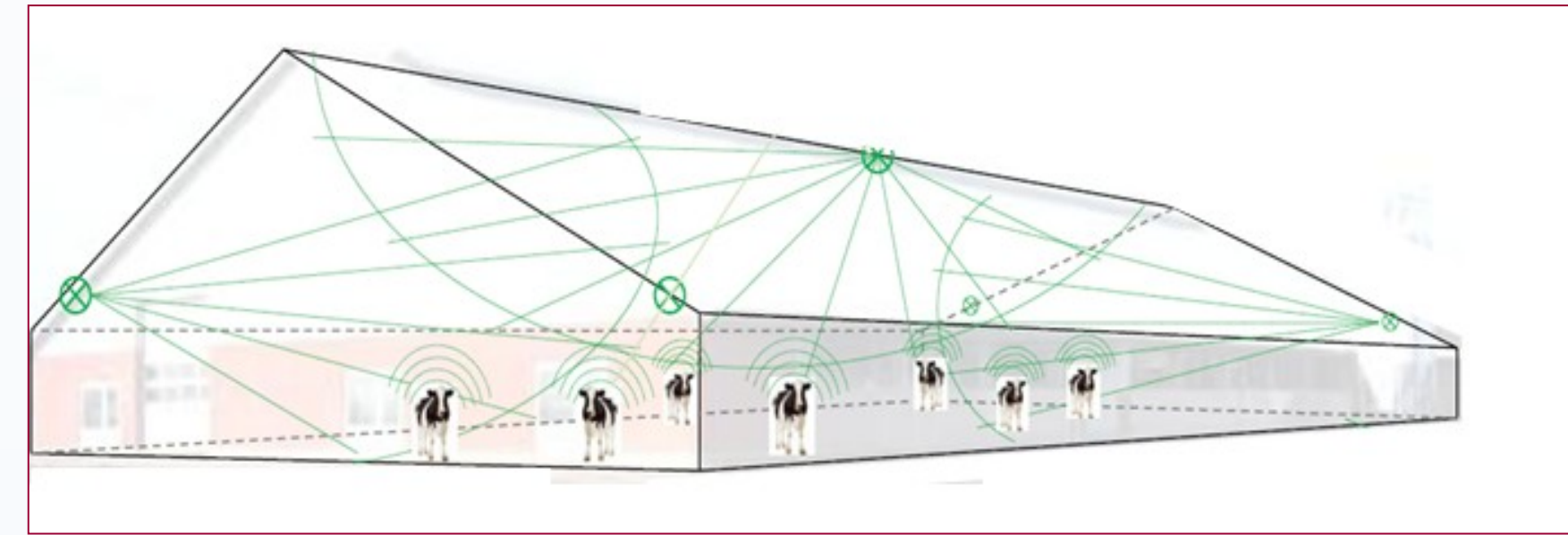


Figure 1: CowView setup.

The tags transmit a signal to the receivers several times each second and by combining the result from several receivers the cow's position can be triangulated with 50 cm accuracy. This allows us to track a cow's position every second of the day.

## Displacement at the feeding area

The most useful method of detecting avoidance behaviour between cows were to look at incidents of displacement at the feeding area.

The method was implemented using Python and searches for sequences in the data which looks like the example in Figure 2.

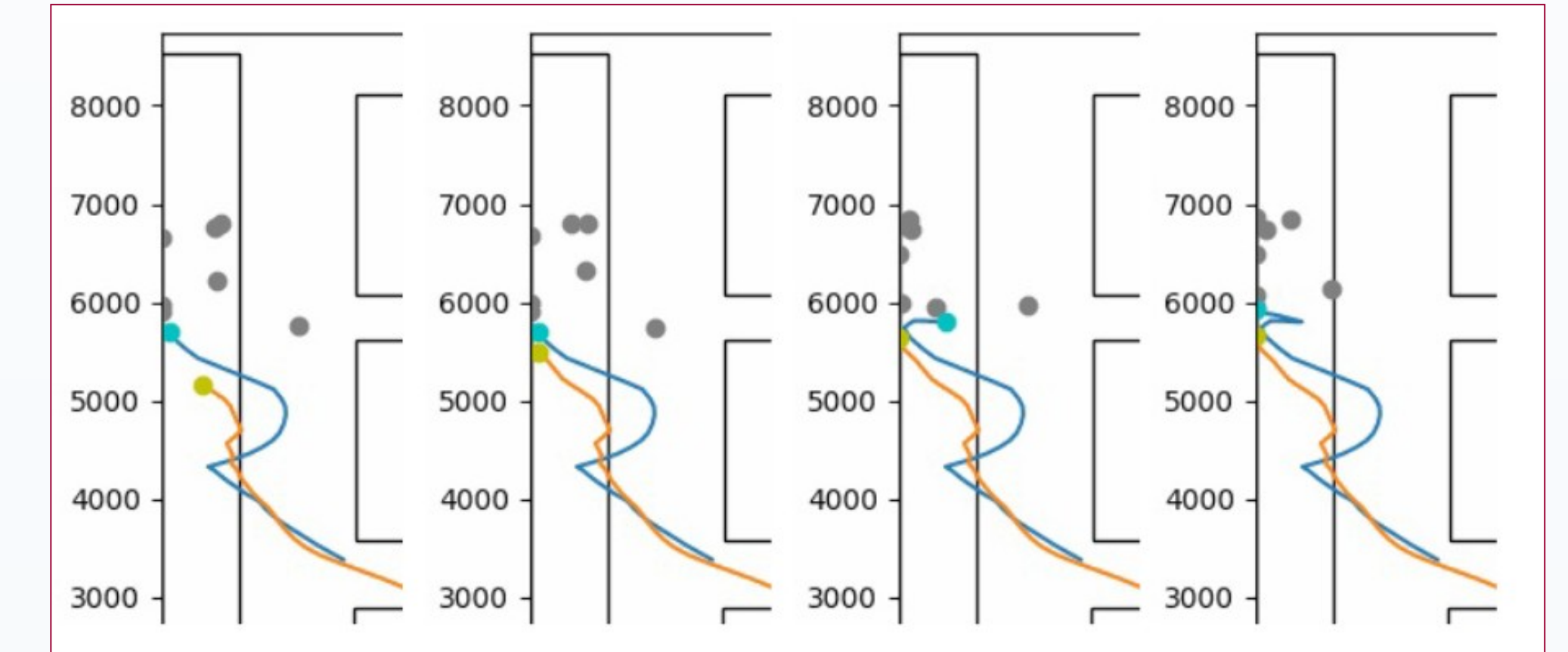
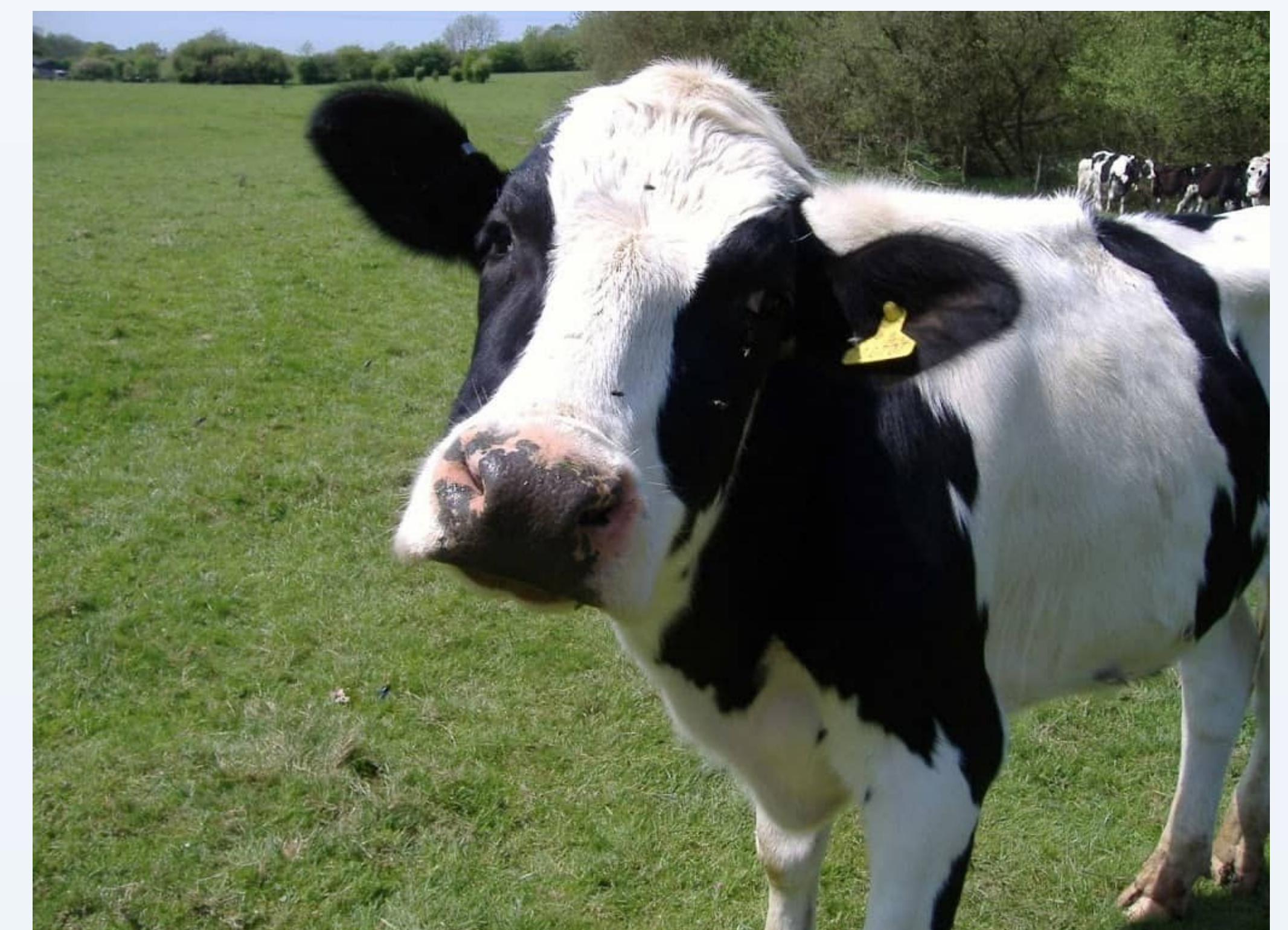


Figure 2: Sequence showing an example of displacement.

## Results

The detected incidents from one day of data were sent to an expert for evaluation. Out of all incidents 50% were labeled as a possible displacement.



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