# Team 7 - CattleLocate

Imagine a rural farm where there is a vast area of land where cattle roam. A storm is nearing your farm, and you must locate all cattle to bring them to shelter. Failure to gather them quickly could lead to the death of many cattle. However, there are several square miles of land where each of them could be at the moment. Time is limited, so searching for them could prevent the farmers from gathering them before the storm arrives. In January 2016, Texas farms were subject to a blizzard, in which thousands of cattle suffocated from snow drifts covering them [1].

Our solution to this problem is to use drone technology with tracking markers to survey the land that is part of the farm. There are existing solutions that use drones to take pictures of cattle today [2], but do not use tracking markers to distinguish each cow. Our solution will not capture photos or video, but will instead upload the locations of each cow when the tracking markers are sensed by the drones using our software. Using tracking markers similar to what is used during vehicle crash testing, the drone's camera software will be able to recognize each animal by the tracking marker on them and plot out on a map available online. Our solution is modular, in that drones may be added to the survey system to solve this scale problem. Each drone can be kept to certain GPS area, and drones can be added when necessary.
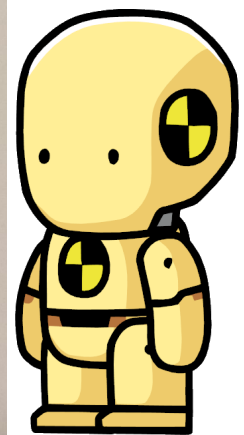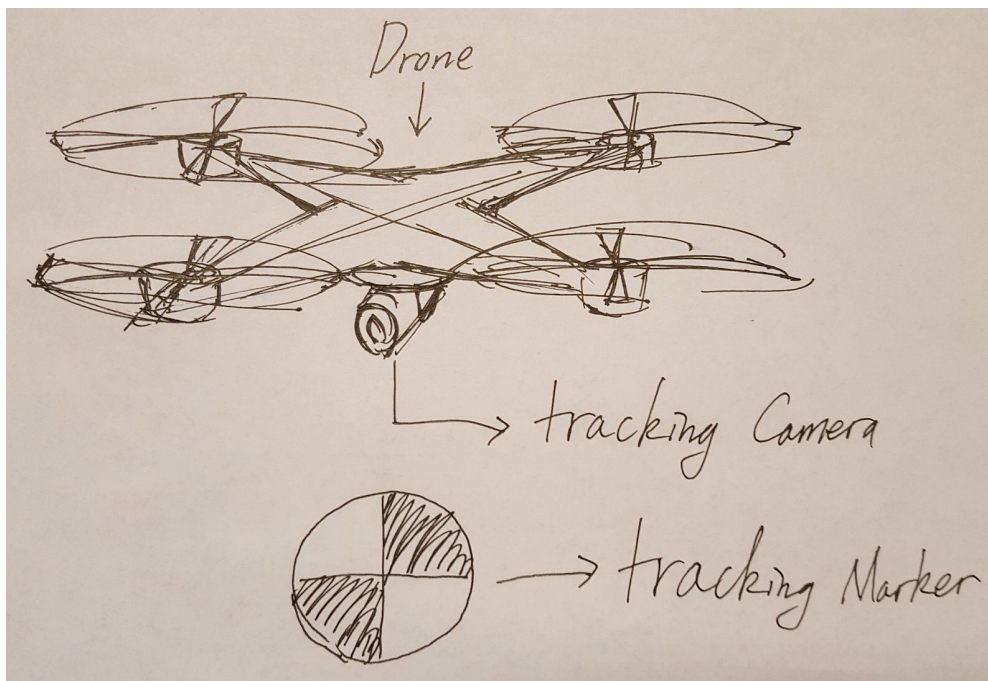
To improve upon the solution and identify each particular cow, RFID tags can be integrated with the tracking marker. The RFID sends a unique signal which can be received by the receiver at the boundary or fence of the farm. It can send an alert to the farmer if the cow escapes the fence.
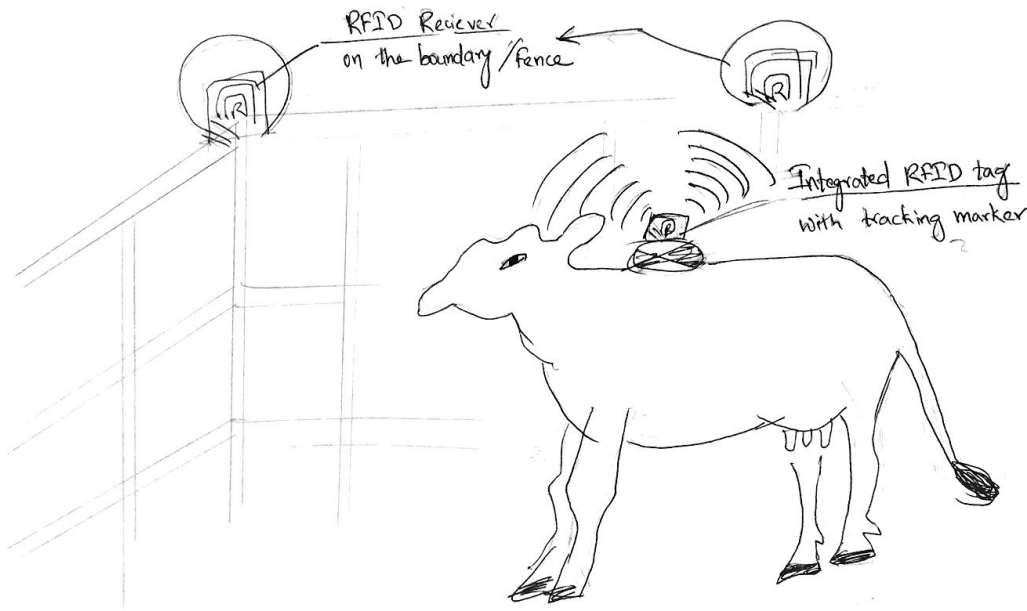
One challenge that our system will encounter is weather. However, with last known location available online, farmers will be able to gather recent locations. After the weather returns to acceptable conditions, the drones will be able to function properly again. A second challenge is how to recognize the markets at night, in the dark. Two potential solutions to this challenge are to use a night-vision enabled camera, or use luminous tracking markers.

Both the buyer and user of the product would be farmers of small and large scale farms. Larger farms are more desirable for this product, as there is more land to survey.

Using CattleLocate, farmers will be empowered to know the near-real time location of all of their cattle, by the use of drones with locating targets on each animal. CattleLocate is modular, so farms of all sizes are capable of implementing this service.

Sources
[1]http://www.texasstandard.org/stories/after-blizzard-ranchers-track-down-wayward-cattle-online/

[2] http://www.farms.com/ag-industry-news/tracking-cattle-using-drones-531.aspx