

AA3D

Drone demonstrations for reindeer herding

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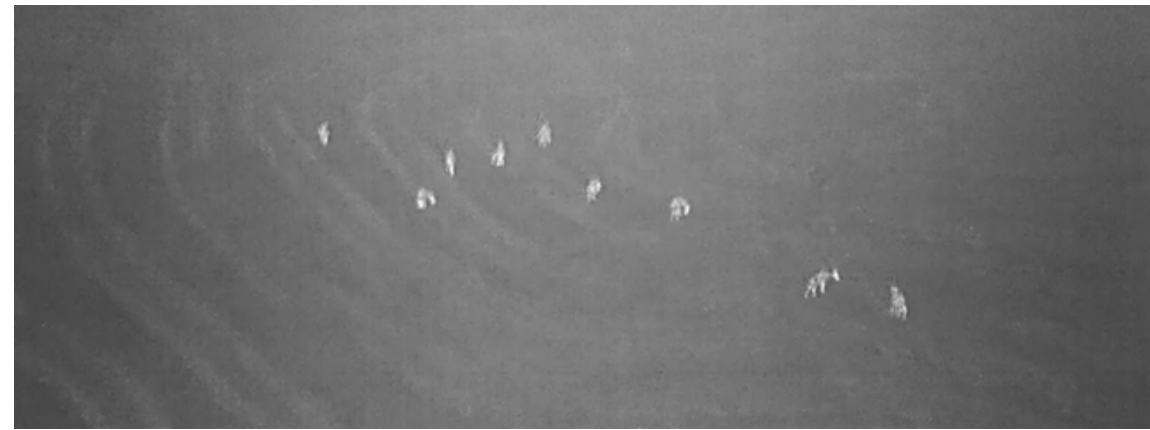
Drone demonstrations for reindeer herding needs

- Finding and observing the reindeer with a drone
- Getting the reindeer moving with the drone
- Locating the missing reindeer in difficult terrain
- Using GPS data to find a reindeer with a drone flight



Finding and observing the reindeer with a drone

- Project tested and demonstrated the use of drone equipped with a normal camera and thermal camera to locate and observe the reindeer.
- The thermal camera image shows reindeer quite clearly even in terrain where are a lot of trees, but especially during daylight hours, the drone's normal camera is accurate enough to find and observe the reindeer.



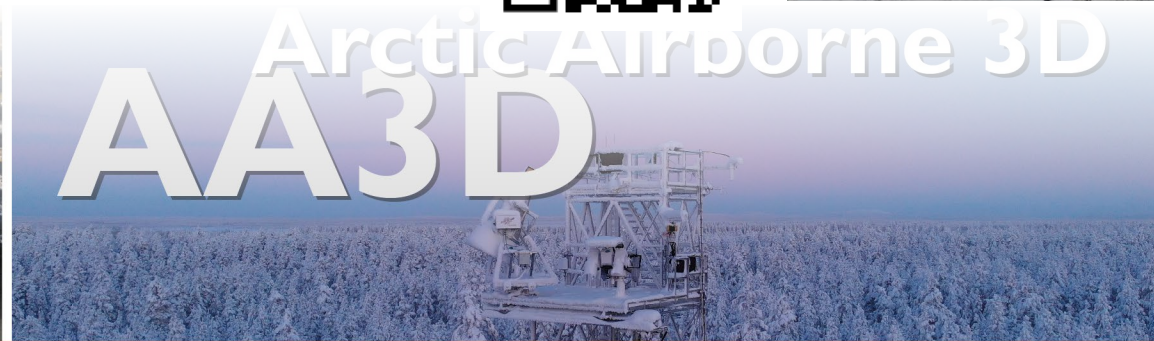
Getting the reindeer moving with the drone

- It is problematic when the reindeer come and stay near to people, fields or houses for a long time and may cause damage. Project explored the possibility of using a drone to move the reindeer away from areas where they are undesirable.
- Two different sizes of drones were demonstrated
 - DJI Mini and DJI Mavic
- Smaller drone seems to mostly annoy the reindeer but the bigger one produced the sound that was loud enough to get the reindeer move.
- Full demonstration video:
<https://www.youtube.com/watch?v=U9Bvrlc9Ngw>



Locating the missing reindeer in a difficult terrain

- The goal of this demo was to check the wellbeing of a reindeer in a difficult terrain
- The reindeer's positioning collar appears to have been in the same GPS location for a long time and the owner worries for the reindeer's wellbeing
 - It was also possible that the reindeer has gone outside the coverage area and the GPS information was not updated
- A drone equipped with a camera was used for checking the status of the reindeer
- The reindeer is easily spotted from the terrain and the quality of the on-board camera enables it to even see the collar
- The case demonstrated the reindeer being fine and the false GPS information being a result from a network or coverage error, or a function of the collar
- Full demonstration video:
 - https://www.youtube.com/watch?v=4HgZDWI_yBs



Using GPS data to find a reindeer with a drone flight

- The goal of this demonstration was to locate and find a suspected dead reindeer according to the latest GPS information from the positioning collar.
- The latest data from the positioning collar had been received 33 days ago
 - Lack of data/missing data could be a result from a broken collar or the possibility of the reindeer being out of the coverage area
- The status of the reindeer had to be checked for further actions
- An autonomous drone flight was planned and executed around the latest GPS information
- During the drone flight the terrain was observed from the screen, and photos were taken from the area
- Unfortunately, in this case the reindeer have been deceased. However, it is important to locate the remaining and identify reindeer losses.
- Full demonstration video:
<https://www.youtube.com/watch?v=VkusPSO3XLo>



Summary

- Reindeer move over a large area, so it is sometimes a challenge for the reindeer herders to know where all the reindeer are and whether all the reindeer are well and alive.
 - It is easier to monitor the situation in the field from the air to find the reindeer and check the status of it.
- Reindeer herders are working usually in remote and difficult terrain. They often encounter situations where they need to access reindeers quickly and flexibly over rough terrain, using a ATVs or snowmobiles.
 - Drone reaches the hard-to-reach places effortlessly and does not mind about the difficult terrain
 - The on-site-search is a lot of faster done with a drone flight than by foot or any another vehicle



Thank you!

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