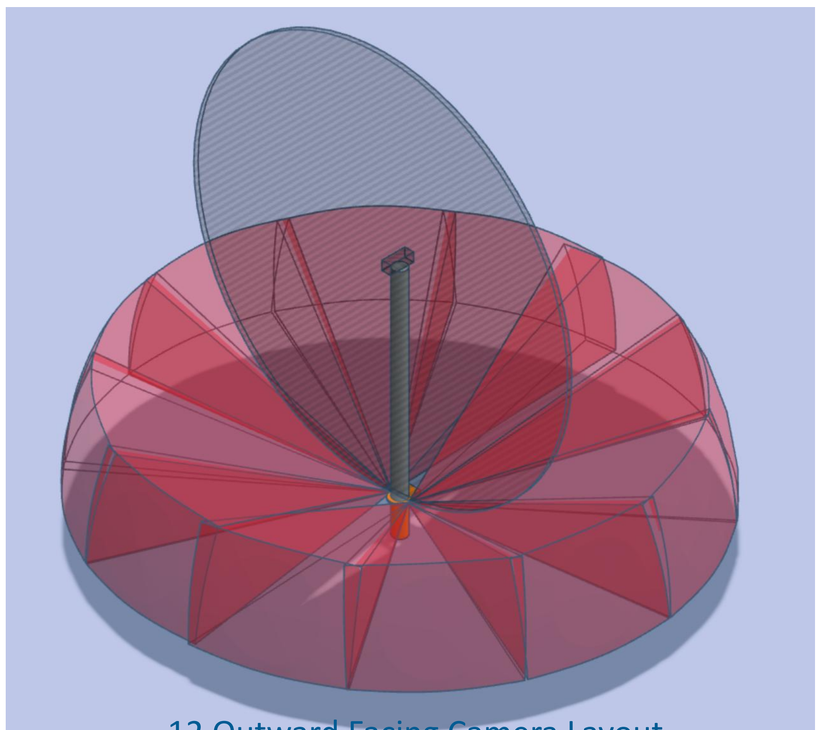
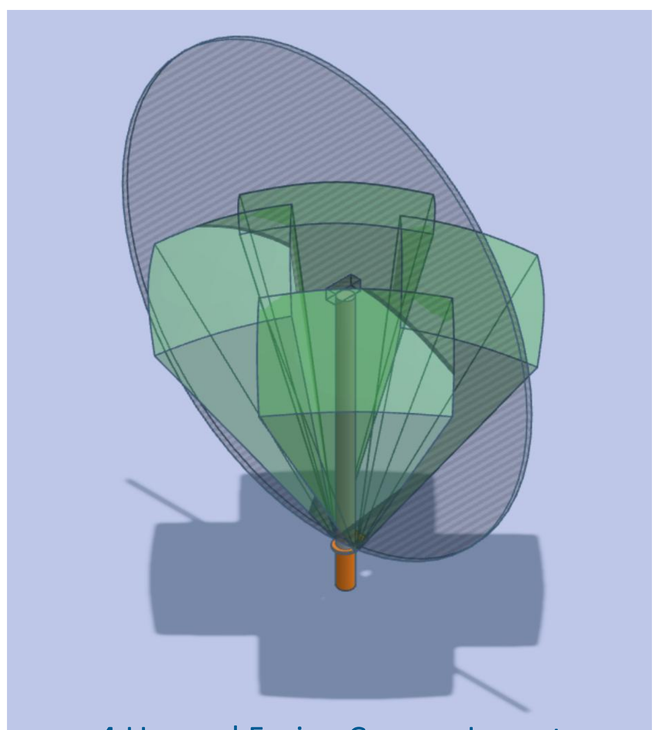
Thermal cameras work to monitor **wildlife activity** at **offshore wind** turbines

Development of an offshore wildlife activity and mortality detection system using thermal cameras



12 Outward Facing Camera Layout



4 Upward Facing Camera Layout

Intro

A pilot study is being conducted to determine the efficacy of using thermal cameras on an offshore wind turbine to monitor wildlife activity, avoidance and collisions. The project is taking place at the Hollandse Kust Zuid (HKZ) Wind Farm off the coast of the Netherlands. We will capture data for a full year (2025) with analysis focused on fall and spring bird migration.

The technology goal is to understand the strengths & limitations of thermal cameras and obtain practical experience offshore.

The biologic goal is to determine the number of wildlife collisions, understand under what conditions they occur, and how they relate to observed flight intensity.

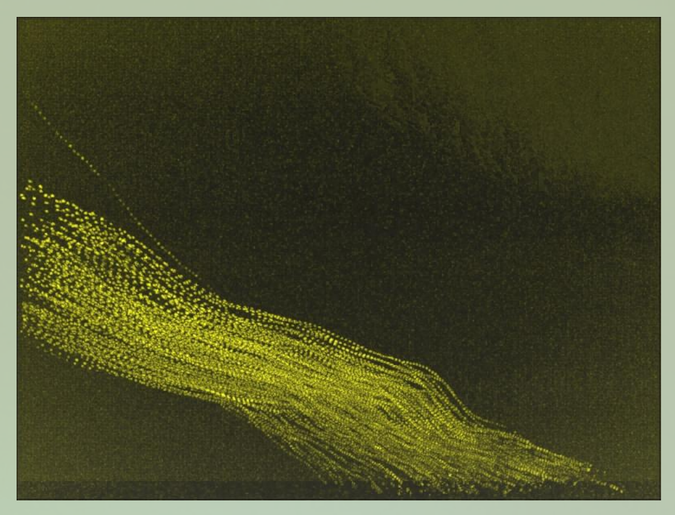
Methods

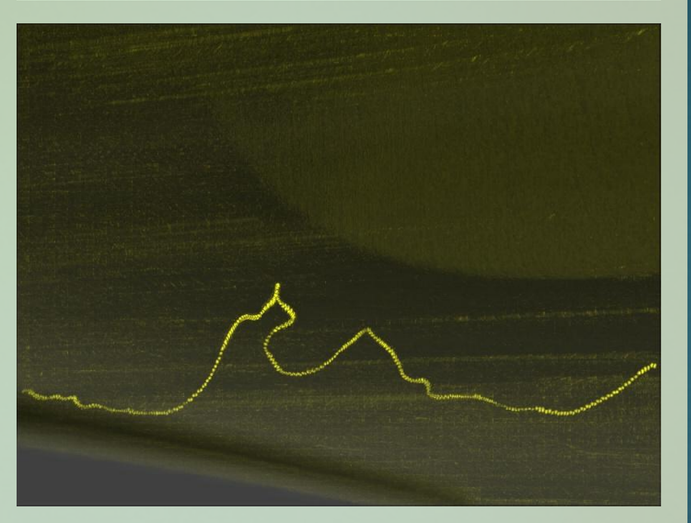
- 12 thermal cameras facing radially outward covering the full 360^{o} around the turbine to detect mortality.
- 4 thermal cameras looking up to monitor the rotor sweep.
- All cameras are mounted on the transition platform.

The cameras record 24 hours a day and the videos are processed using machine vision and AI to detect, track, and classify each track. The tracks will be used to analyze the behavior of wildlife near the turbine, including any micro-avoidance and behavior that may lead to a fatality.

Initial Results & Next Steps

Cameras were installed in November 2024 and have recorded continuously since. All videos have been processed into tracks and summary images. Next steps include creating an ML track classification model and the identification of potential fatalities.





Acknowledgements

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