



PRESENTATION

# OFFSHORE

[www.nvisionist.com/nvbird-offshore/](http://www.nvisionist.com/nvbird-offshore/)



**nvisionist**



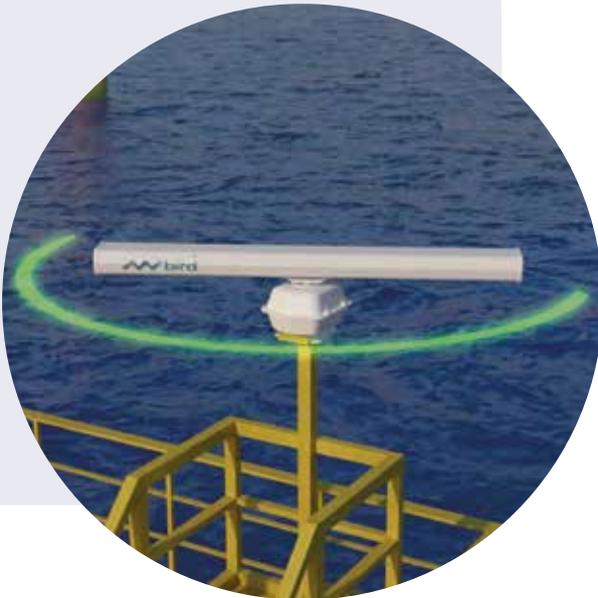
## ● ABOUT US

nvisionist S.A. is as an Advanced Information Technologies company. At nvisionist we design, create and offer innovative solutions and services that benefit organisations, communities, the environment and contribute to the quality of life and conservation of resources.

**The company operates with new technologies, knowledge and education and is at the forefront of innovation to address many of clients' needs in our evolving world.**

Our team is highly experienced in developing, permitting, engineering, project managing, installing, operating and maintaining ICT, Bird Detection & Monitoring and environmental projects.

The executives and the staff of the company are experts at designing applied Artificial Intelligence (AI) and Machine Learning solutions. They provide applied solutions based on advanced Machine Learning algorithms that really work, offering a fast return of the initial investment.



## THE PLATFORM

The system communicates directly with the wind turbines. Access to all operational data is crucial both for the park owner and the environmental authorities.

**We use big data analysis and a report generator to produce a standard dashboard that it can be further adapted to client's needs with graphs, pies, bars, etc. All reports can be exported to various formats.**

All the information get uploaded in the cloud and are accessible to the ornithologists to remotely classify the birds that have not been classified automatically. Then, the system algorithms get “retrained” and the quality of detections and recognitions improves.





## THE CHALLENGE

As more and more offshore wind parks are built around the world, low-conflict areas for wind turbines are becoming scarce, the global need for migrate bird protection is rising and there is also a clear need for more accurate and reliable solutions.

For the first time an innovative system combines radars and cameras to achieve the required accuracy and reliability and at the same time to maximize wind turbine availability. The system can be installed to offshore wind parks and to large flat areas where onshore wind parks are located.





## THE SOLUTION

The innovative solution uses radars and Ultra High Definition cameras of 12 megapixels in combination with Thermal vision technology to achieve 24 hours, all weather detection and operation.

The detection range of the radars is up to 10km. Then cameras are enabled to classify the targeted birds once the distance is less than 1km. The classification of the birds depends on the quality of the dataset the system has been fed. The more data available on a specific bird of interest, the better.

When the birds are flying in a collision route (direction and height towards the rotor swept area) with the wind turbines the system sends an automatic command via the OPC server to slow down the rotor speed in order to further analyze the flight data.

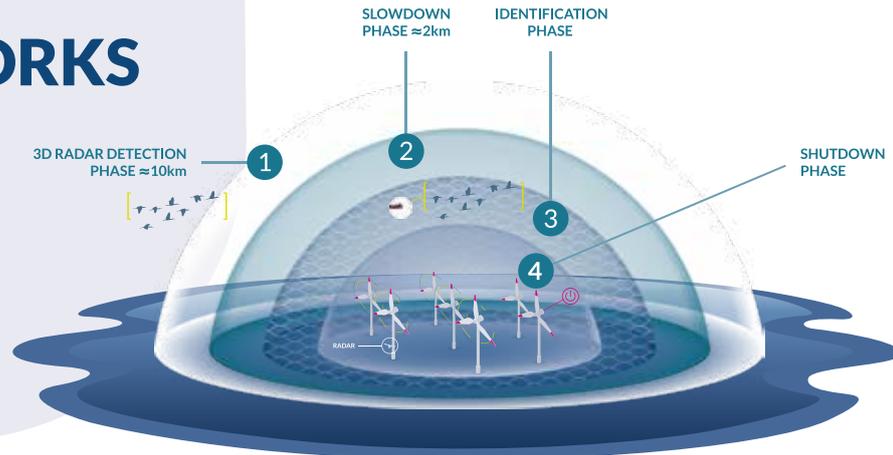
The systems are able to monitor the operation of the wind turbine by receiving input data from the SCADA system in order to improve their functionality.

Furthermore, based on the process of detection and classification, state of the art acoustic driver modules with adjustable volume are used -if allowed- to deter birds entering the wind turbine risk zone, making them change route.

In the extreme scenario that a bird enters the critical zone, the turbine (or group of WTGs) can receive automatic signals in various formats, in order to stop its/their operation and prevent the collision.



# HOW IT WORKS



## 1 3D RADAR DETECTION PHASE

3D Radars are installed on the perimeter of the wind park covering the surrounding area for distances up to 10km. In case of a flock of birds approaching, the flight trajectory is recorded by the 3D Radar.

## 2 SLOW DOWN PHASE

In case the flock is in collision route (direction and height data) with the wind turbines the system sends an automatic command via the OPC of the wind farm to slowdown the rotor speed of those wind turbines in the route of the flock.

## 3 a. IDENTIFICATION PHASE

The cameras record the birds as they approach further and artificial Intelligence and machine learning algorithms are applied in order to categorize them in critical or not critical species according to the environmental impact assessment of the wind park.

## b. DETERRENCE PHASE (optional)

In case the identified birds belong to the critical species and enter the critical zone of one or more WTGs, a sound is enabled to the direction of the birds in order to deter them and steer their flight accordingly.

## 4 SHUTDOWN PHASE

In case the birds remain in the critical zone or further approaching the RSA (Rotor Swept Area) the system sends a direct signal to stop those Wind Turbines in the direction of the flight.





## HOW WE DIFFER

- ✓ AI to maximize accuracy, with minimum false positive or false negative events

Able to estimate distance and height of the detected birds in different background contrast, especially in offshore environments via use of radars

- ✓ Classification of bird species according to EIA  
Robust and able to withstand harsh weather conditions
- ✓ Avoid multiple rows of speakers
- ✓ Advance reporting capabilities to meet authorities demands





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