

nvbird airport

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 Challenge

The presence of wildlife (birds and animals) on and in the aerodrome vicinity poses a serious threat to aircraft operational safety.

Airports are typically located on the outskirts of large cities with extensive areas of unused, undeveloped land. That undeveloped land is attractive to birds, due to urban expansion and because they view the vast airport area as a safe place for resting, gathering in flocks, or hiding from predators.

Bird Strikes especially during takeoff may seriously damage the aircrafts or even have fatal consequences. Analysts estimate the cost of bird strikes between 1 and 2 billion US dollars per year. A significant 59% of reported strikes occurred below 100 feet (30 m) and 92% below 3,000 feet (900 m). In terms of flight phase, 33% occur on approach, 31% during take-off and 26% upon landing.

All airports need to take measures for the protection of aircraft, the humans onboard and the birds. Airport operators, as part of their certification requirements, must have a Wildlife Hazard Management Plan and are obliged to undertake a birdstrike hazard assessment, in accordance with CAP 772 (Birdstrike Risk Management for Aerodromes) and install appropriate controls.

Currently the majority of airports rely on human patrols to observe and identify bird movements and scare them away by firing air cannons or play distress sounds from vehicles equipped with big speakers.

Few airports deploy advanced radar systems which are extremely expensive and effective only on flocks of birds or very large birds.

The Solution

Nvbird airport uses RGB cameras in combination with advanced yet inexpensive surface radar, in order to monitor the risk zones of the airport under any circumstances.

The cameras are strategically located along the runway in order to monitor the entire length of the runway and cover both the approach and take-off areas up to a height of 1,500 feet.

The machine learning algorithms and artificial intelligence ensure that birds in critical areas in the flight route of aircraft during take-off and landing are detected. When hazardous objects are detected, the system performs a series of actions in order to prevent them from colliding with the aircraft.

In addition, the system has the ability to detect drones as well as to monitor for any foreign object debris (FOD) on the runway. This relates to various objects (fallen from aircraft or vehicles, broken ground equipment, animals, etc.) that are present on a runway that may adversely affect the fast-moving aircrafts.

The Hardware

The hardware of the nvBird system consists of

Ultra-high definition cameras with a 103° -44° horizontal and 75° -33° vertical field of view and Super Starlight technology able to provide color video in low-light conditions, and clear monochrome images in conditions as low as total darkness.

- a very powerful server, capable of fast processing and rendering high resolution images.
- Radars to detect flocks of birds as far as 8 n.m. in all weather conditions.
- Speakers and strobe lights in order to deter the detected birds within the airport area.

The Software

Our software is built around a unique machine learning algorithm, developed in-house, capable of detecting birds, flocks of birds, drones and other objects of interest within the critical areas of the airports. After detecting a hazardous object there is a sequence of decision-making processes based on Artificial Intelligence that monitors their position, flight trajectory and speed and estimates whether they could adversely affect the airport and aircrafts safety.

The Platform

Our platform is web-based, with a friendly user interface and can be accessed by a simple browser. Once the user logs into the system, he has access to valuable data, reports and KPI's from the airport areas the nvbird system is monitoring. The dashboard is configurable, and the user can adjust it to his preferences. The platform features a solid report generator that delivers customizable reports on demand.

How it works

We use state of the art Artificial Intelligence algorithms to detect birds in risk zones. Our system can continuously improve its detection capabilities by using Machine Learning technology.

Ultra High Definition cameras with a field of view:

Horizontal: 103°

Vertical: 75°

Diagonal: 135°

are combined with Thermal vision technology to achieve 24 hours, all weather detection and operation.

The radar as part of the system can detect birds from up to 8n.m. It is located in a designated area inside the airport perimeter and works parallel to the cameras creating a safety surveillance dome with a radius of 8n.m.

Nvbird is modular and scalable in order to meet all installation requirements.

The system can be implemented but not limited to in the following cases:

1. During the take-off or landing process, a bird or flock of birds flies over the runway.
2. During the take-off or landing process, a bird or flock of birds flies at a distance of 3-8 n.m. in the landing-take-off route of the aircraft.

Projects

A pilot project is under development in an airport located in a Greek island.

How we differ

1. The system uses a combination of radar and HD cameras to detect birds at areas on the airfield where they could cause a hazard to the planes.
2. The cameras are placed in strategic locations at the airport so that the whole runway and airfield is covered.
3. Using artificial intelligence and machine learning algorithms the system eliminates fault activations of deterrence sound, maximizing airport and flights safety and minimizing expensive aircraft damages from bird collisions.
4. The process detection-identification deterrence is completely autonomous.
5. The system requires minor maintenance.