Bird Strike On Aircrafts

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What is the problem?

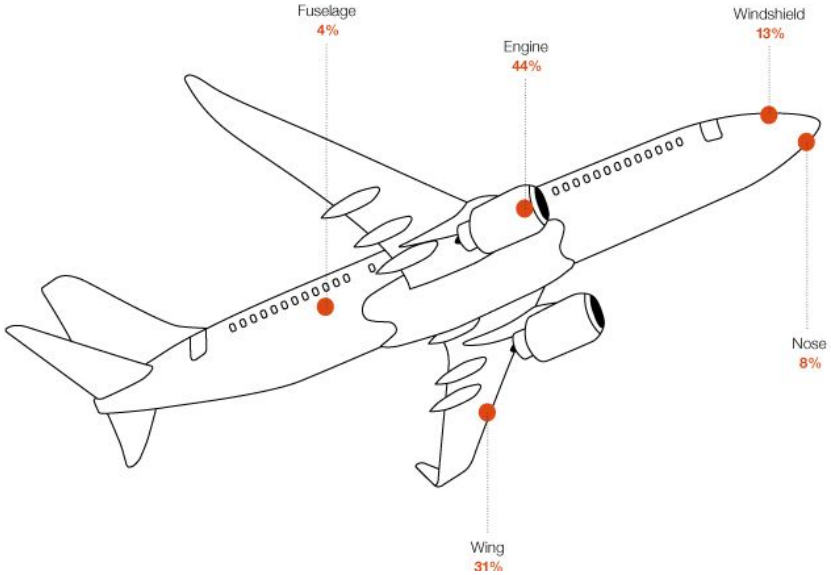
- Bird strikes are a common problem in the aviation industry causing potential damage to the aircraft or its engines.
- Bird strikes on aircraft are estimated to cause around 1.6 billion dollars worth of damage each year.
- It not only results in significant costs, but can also lead to a plane crash and injury to persons.

What is the problem?

- Although the crashes involve a myriad of wildlife, the majority of the crashes involve birds.
- Every time a bird collides with an aircraft, a bird strike inspection must be performed to evaluate the hazard.
- Bird strikes can have significant economic and occasional safety consequences for flight operations.

Example of a bird strike

% of Body damage



Existing solutions In other countries

- provide adequate wildlife control measures both natural and artificial
- Mesh or grill in front of the engine
- Radar systems

Natural wildlife control measures

- Shorter vegetation, the netting of water reservoirs, passive bird control measures on buildings and falconry.
- The use of saker, peregrine and other falcons with various teams distributed over the day can create hostilities in the affected territory.
- Flying models in the form of predators are used. These are controlled by experienced pilots. The models are capable on long ranges and flying high.
- Install bird control measures in airport buildings. We provide a number of extremely effective systems e.g. electrical systems, spikes, wire systems etc.

Artificial wildlife control measures

Predator Cry Systems

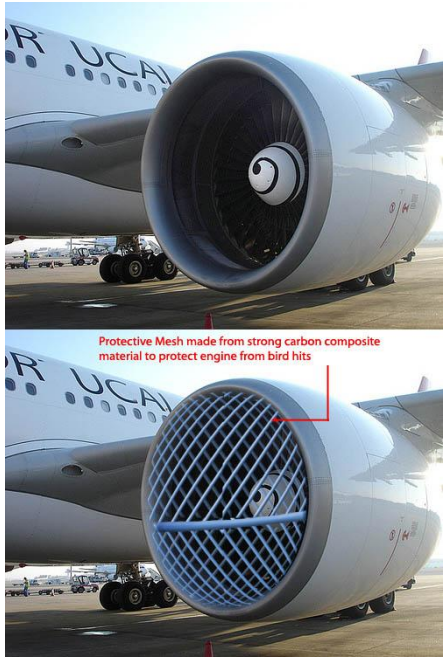
- Birds react to acoustic stimuli. These imitate predator and the warning cries of the birds to be controlled. The habituation effect is reduced by modulating the cries, changing frequencies and intensity.

Visual Methods

- Birds perceive light at 532nm wavelength particularly well. The TOM500 laser system is with its green light very effective. The laser is only directed downwards so that it is completely safe.

Preventing physically

- Mesh in front of engine



Problem

Screen or grate in front of the engine would produce turbulence in the air behind it, and what the engine needs is a smooth flow of air. If the flow is disrupted, the compressor at the front of the engine may stall, causing the engine to lose lift.

TONI Bird Control Systems

The latest radar technology allows the exact localisation of birds and to monitor their behaviour which allows air traffic to be controlled or bird control measures to be initiated.

TONI Bird Control Systems – a team of bird control specialists, ornithologists and radar technicians will provide you with comprehensive and integrated bird strike solutions.

S-band (100mm) radars with a range of 6-8 nm are used with which even the smallest flying object of ca. 2 mm can be plotted.

The latest software analyses the data of all flying objects and classifies them on the basis of their typical flight behaviour.

MERLIN Radar

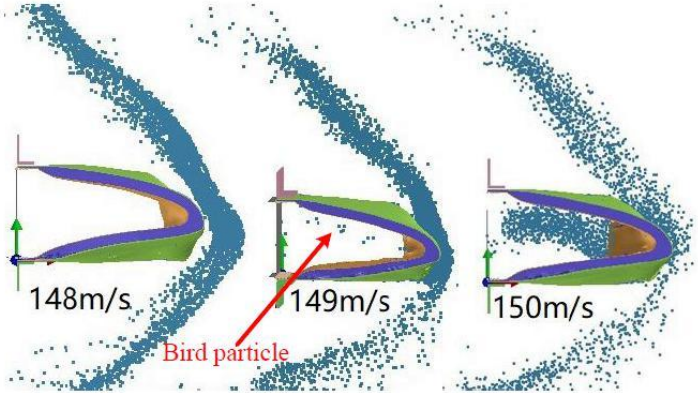
The First Fully Automatic Radar Solution

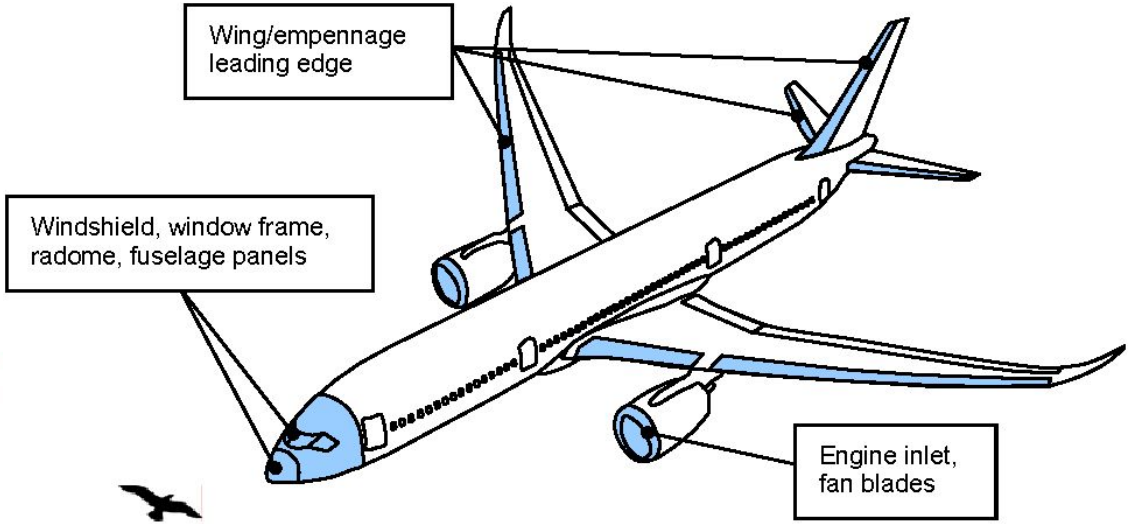
It analyses the radar raw data using typical flight patterns and automatically classifies the risk to runways.

Fully automatic feedback via monitors to the airport tower and bird control personnel is possible also automatic identification and classification

Other methods implementable in India

- The German Air Force (Luftwaffe) Method
- Basic ecological bird-strike prevention measures include (Wilhem Rulhe, 2008):
- Pyrotechnics





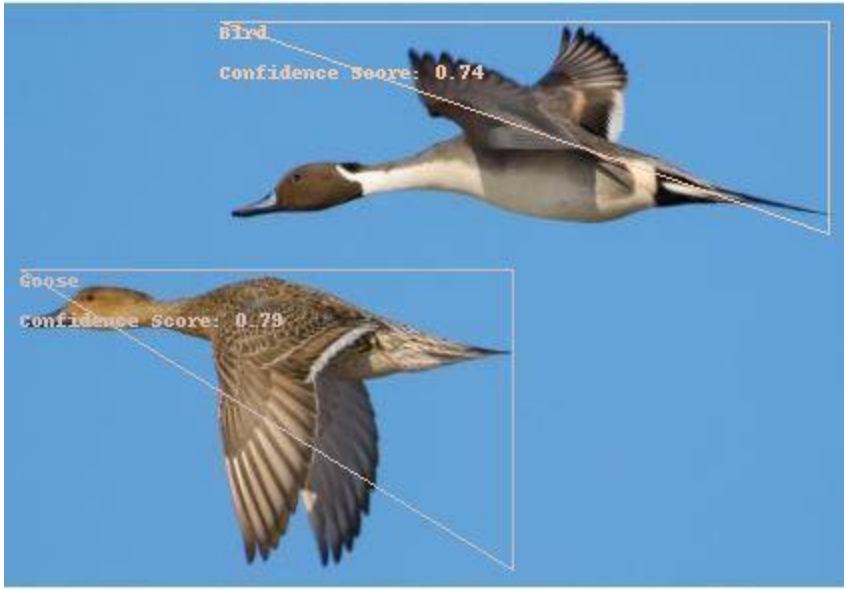
Proposed solution

Using Google Cloud Vision
Object Detection:

Google Cloud Vision

Object detection systems can be used to mitigate bird strikes by evaluating risk before takeoff.

Using Google Cloud's API Live Object Detection and Tracking to detect objects in live streams, which would be ideal for pilots who need to scan their line of vision in real-time flight.



Example of how it works

Proposed Algorithm

The algorithm of the project would involve the use of the Google Application Credentials and Service Key, and having them read and link to the desired JPEG images of the bird wildlife, all saved under the same virtual environment.

Next, the contents of the image would be analyzed and print the number of objects in the image, the classification of the object, and the confidence level.

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