The aim of this project is to design an autonomous bird deterrent system that is effective in deterring birds from areas such as airports, farms and public buildings.

Machine vision will be used in order to continuously track the movement of the birds in flight and the surrounding area.

Agriculture

1) Birds cause more damage to produce farms. Each year birds destroy crops and cause farmers significant economic damage. Studies at the New Zealand show that 87% of crop damage from birds.

2) A study conducted in Poland concluded that, in the years 1974 and 1980, 22% and 16%, of cherry crops were destroyed by birds. In that same survey, overall bird damage was also collected for four crops: wheat, oats, corn, and barley.

3) this can lead to a significant reduction of crops (1–2 tons per week) and increased risk of disease (reducing the quality of the fruit).

4) Using of net for protect farms is too expensive.

5) that was significant enough to be considered a problem.

6) some Diseases are easily spread in places of high population due to the amount of droppings birds produced. Because, birds go at landfills, on oil-rig platforms, and come in parks.

Aviation industry

1) The USA (2001) has also found that bird damage annually causes $500 million of damage to aviation industry and the cause of 400 human deaths from bird-aircraft collisions.

2) In 2003 alone there were 4300 bird-aircraft collisions reported by the U.S.

3) This amount of damage has made the U.S. place a high priority on the development of a successful bird deterrent system to ensure the safety of its aviation industry.

❖ **Common methods of scaring birds:**

✓ **Visual Deterrents**

1) Visual deterrents cause visual stimulation in birds that can cause fear. A sense of danger can be created by a simulated hunter.

2) they are human-like. they usually made from inexpensive materials and old clothes. The more important things are their body shape with bright colors.

✓ **Reflectors**

1) Reflective is a rubber or a sheet of silver metal, and the other side is colored with a resin.

2) This tape emits flashes of light when the light hits it and produces some sounds when the wind hits it. Because of the noise and reflection, this type of tape is often found in farms.

✓ **Radio-Controlled Aircraft**

1) Aircraft may scare birds off both farms and airports. However, RC aircraft require a skilled operator, this aircraft has proven to be difficult to fly and, therefore, requires a specifically trained operator.

2) And also, due to their low battery capacity, which equals low flight duration, it is necessary to evolve planning optimization.

✓ **Voice**

Sound production causes human annoyance and noise pollution.

✓ **Chemical methods**

It causes the destruction of a certain species of birds and the pollution of the environment and agricultural products.

✓ **the light**

Light production without specifics aim is not very efficient and over time the birds get adapt to it.

that was developed out of the Netherlands for controlling birds in airports. It had been adapted to agriculture and used successful in blueberry farms in Europe and America.

How does the technology work?

1) it is based on using a high-powered laser that the birds perceive the laser as a physical threat and un safe area.

2) The laser is combined with a camera and software for programing. so that it has continuous movement throughout the area.

3) it is programmed by setting waypoints and times when the program should be active.

4) This way, the laser can be directed to the areas where it is required and avoid shining outside the area to be controlled.

5) As it is automated, it is able to repel birds whenever required.