

Project Documentation: Personal Space Protection Robot

Github Repository (includes README file and schematics):

<https://github.com/Jodistroyer/UAL-CCI-CM-Machine-Vision-Arduino-Laser>

Introduction

Do you ever find yourself frustrated when people invade your personal space while you're trying to work? This project aims to address that issue by creating a robot that uses lasers to deter unwanted intrusions.

Components Used

- Arduino Leonardo
- Breadboard
- SG90 Pan and tilt frame with screws
- SG90 Servo Motor x 2
- KY-008 Laser Module x 3
- Tape for assembly

Inspiration

The idea for this project came from an anti-bird laser video I saw:

<https://www.youtube.com/shorts/t54or5-TojM>

While I don't have a problem with birds, I do have a problem with humans invading my personal space. This motivated me to start this project.

Project Development

Phase 1: Initial Setup

1. **Buying Parts:** I began by purchasing the necessary components.
2. **Assembly:** Using modern engineering techniques (mainly tape), I put everything together.

Phase 2: Prototype

I built a working prototype that could be manually controlled. However, the need for manual control seemed counterproductive. If manual intervention was required, one could simply point the laser directly without the robot.

Phase 3: Automation

To enhance the functionality, I incorporated Artificial Intelligence (AI) and Machine Vision to enable the robot to automatically detect faces and track movements.

1. **Coding:** Extensive coding was required to integrate AI and Machine Vision.

2. **Testing:** The robot was tested to ensure it could accurately track and follow a person's face.

Phase 4: Additional Features

Recognizing that the robot was still missing an element of deterrence, I added speakers and recorded a loud sound that the robot would play whenever it detected a face. This additional feature made the robot shout phrases like "GET OUT!" along with a loud siren sound.

Demonstration

The robot successfully tracks and follows a person's movements, shining lasers directly at their face. It also emits loud sounds when a face is detected, effectively deterring intrusions.

Future Improvements

- Adding more lasers for increased effectiveness.
- Incorporating more speakers for a louder deterrent.

Conclusion

This project was a success in creating a robot that protects personal space using lasers and sound. However, it highlighted the importance of safety precautions, such as wearing sunglasses to prevent potential eye damage.

Thank you for following along with this project!