

Executive Summary

Each year billions of birds die globally around the world from high-speed collisions into windows. Window collisions are one of the most significant human-related causes of bird deaths. Our bird deterrent system is an approach to help mitigate the number of bird casualties annually. The system utilizes a machine learning camera mounted on a window, that will then identify incoming birds and then use LEDs to trigger a flash of lights to ultimately deter the birds from approaching the area. The project was split up among the team members by interest and skills, every member was responsible for an area that demonstrated their knowledge of ECE fundamentals.

Challenges we faced while working on this project include PCB design and how we were going to detect approaching birds accurately. A majority of the winter term was spent working on a PCB design for our system, after numerous revisions and meetings with our instructor we believed to have a good design. However, when putting our system together we found issues with our PCB that ranged from fault I2C busses to having to solder wires to complete trace lines. For bird detection, we weren't sure what the best approach was so we decided to use both motion and bird detection for our system. A challenge with this is that our system was able to detect movement but it struggled to detect birds from afar. These challenges quickly turned into lessons for future projects, these lessons include better time management and flexibility with a design. Having better time management we would have found the PCB issues earlier before our system implementation. Flexibility proved to be important because there will always be situations where something doesn't work out correctly and being able to adapt and address the situation will be an important skill to have.

Project Timeline

PROJECT TITLE						TEAM NAMES										
Bird Deterrent Device						Sawyer Brundage, Abdulhameed Alkawi, Marcus Plumley, Max Garcia-Matzumilla										
PROJECT PARTNER						DATE										
Gerrad Jones						5/6/2022										
						FALL			WINTER			SPRING				
						OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE		
WBS NUMBER	TASK TITLE	TASK OWNER	START DATE	DUE DATE	DURATION (days)											
1	Problem Definition and Preliminary Design		10/22/21	12/3/21	42											
1.1	Project Partner Meeting	Hameed	10/22/21	10/22/21	1											
1.2	Define Project Requirements	Max	10/22/21	11/12/21	21											
1.3	Define Project Risks	Marcus	10/22/21	11/12/21	21											
1.4	Make Block Diagram	Sawyer	11/29/21	12/3/21	14											
1.5	Technical Demonstrations	Everyone	10/22/21	12/3/21	42											
1.6	Design Impact Assessments	Everyone	10/22/21	12/3/21	42											
2	Modular Design and System Testing		11/29/21	3/15/22	103											
2.1	Clock Design + Validation	Hameed	11/29/21	2/3/22	66											
2.2	Power Supply Design + Validation	Marcus	11/29/21	2/3/22	66											
2.3	ML Camera Design + Validation	Max	11/29/21	2/3/22	66											
2.4	LED Lights Design + Validation	Sawyer	21/29/21	2/3/22	66											
2.5	LED Light Code Design + Validation	Sawyer	2/3/22	3/3/22	28											
2.6	Enclosure Design + Validation	Hameed	2/3/22	3/3/22	28											
2.7	PCB/Micro Design + Validation	Max	2/3/22	3/3/22	28											
2.8	UI App Design + Validation	Marcus	2/3/22	3/3/22	28											
3	Project Closing		3/15/22	5/6/22	52											
3.1	System Verification	Everyone	3/15/22	5/4/22	50											
3.2	Final Documentation	Everyone	3/15/22	5/6/22	52											