Bird DIY: Building an RFID system to study behavior in free-living starlings

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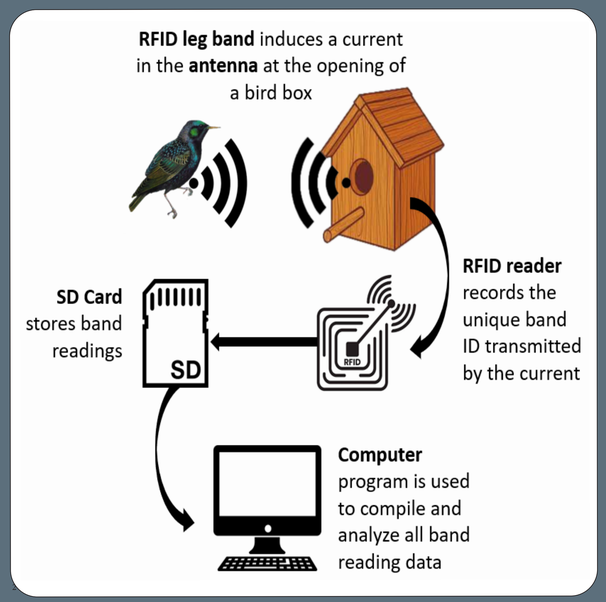
Scan for Full Abstract

Background

- Radio frequency identification (RFID): a wireless system that utilizes electromagnetic fields to identify a tag connected to an object.
- The RFID reader created by Eli Bridges and Jay Wilhelm provides a low cost reader alternative to traditional,cost-prohibitve custom RFID systems.[1]
- When applied to avian research, an RFID system can be used to get otherwise unreachable metrics of parental behavior, nestling development, and visitation at other boxes.[2]

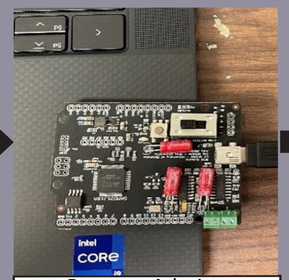
Aim: To create a primarily DIY, cost effective RFID system for use on European Starling (Sturnus vulgaris).

How it Works

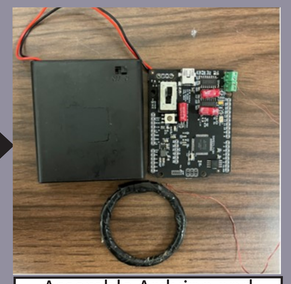


DIY RFID Systems can be implemented **efficiently and cost effectively** for avian research.

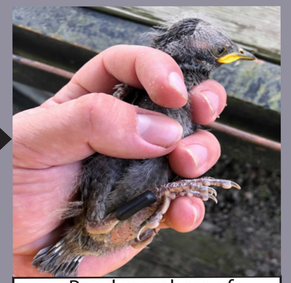

Create Antennas from magnet wire



Program Adruino RFID Readers


Assemble Arduino and Antenna


Create RFID Bands using PIT tags and heatshrink


Band members of starling population


Attach RFID reader to bird box

Various data can be collected from RFID Systems

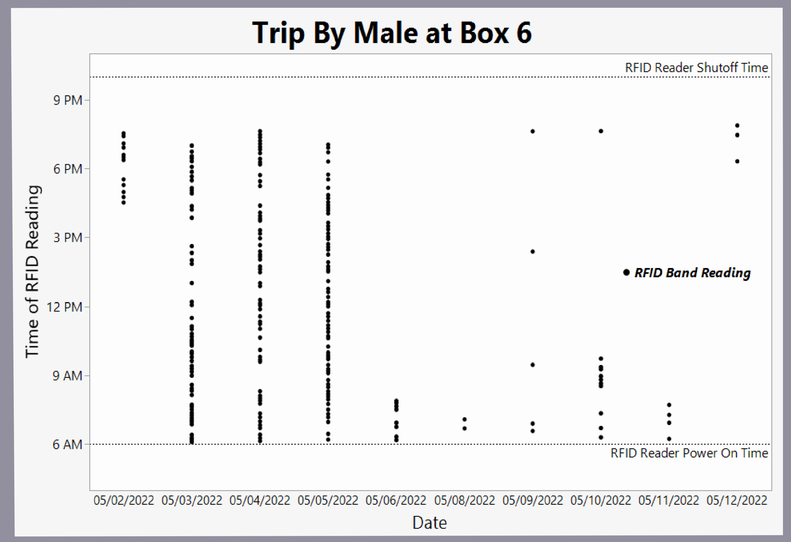


Figure 1. Daily visitation by the primary adult male at a bird box with an RFID reader.

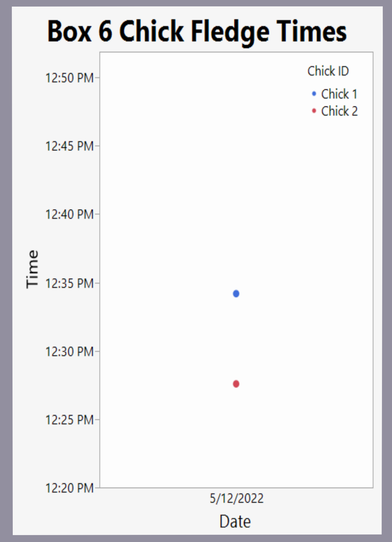
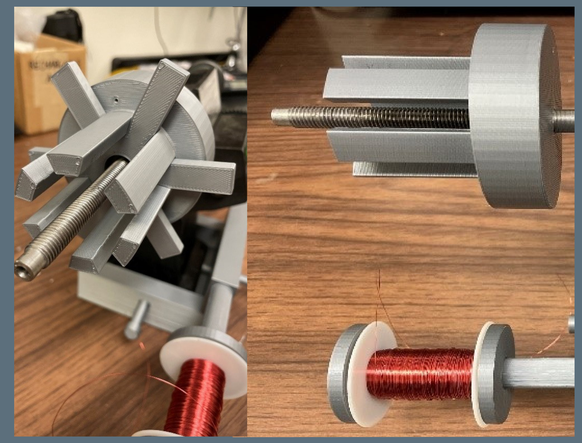


Figure 2. Chick fledge times from a box with an RFID reader.

Antenna Coiler Designed for Project



A wire winder attachment for quickly creating uniform antennas

Future Directions

- Using solar panels to power RFID readers in order to drastically reduce battery changing and avoid excess battery waste.
- Conducting longitudinal studies on the year-to-year return rate of previously banded starlings.

CITATIONS

[1] Bridge, E. S., et al. (2019). An Arduino-Based RFID Platform for Animal Research. Frontiers 7.

[2] Bonter, D.N. and Bridge, E.S. (2011), Applications of radio frequency identification (RFID) in ornithological research: a review. Journal of Field Ornithology, 82: 1-10.

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