

## TEAM DAVINCI EXECUTIVE SUMMARY

The diversity of bird species on Earth is immense. With over 11,000 species identified today, it is no wonder many humans, or birders, take keen interest in observing and documenting their locations, but the list of species that are endangered or critically endangered grows as the threats of shifting birds' breeding and migratory seasons due to climate warming. For these reasons, identifying species of birds is not only a leisure activity for birders, but it is also crucial to protect the diversity of birdlife we know of today.

### OUR PRODUCT



The DaVinci Team of the Erdős Institute has utilized advances in computer vision technology with the goal to train a machine learning model to classify species of birds. We then applied this model in a prototype app *ChickID*. In doing so our project addresses two primary goals:

1. Generate an algorithm that could take images of birds to identify the species.
2. Ensure our model could function even using amateur-level images with a high degree of accuracy, to ensure accessibility of identification.

Our product can be applied for both private and public settings to allow for fast and accurate identification.

### THE GROWING GROUP OF BIRD HOBBYISTS

According to the U.S. Fish & Wildlife Service, about **45 million Americans are birders**. Many of them invest heavily in their hobby, and that amount grew during the COVID-19 pandemic. Accordingly, applications that have the ability to identify species of birds have soared in popularity. For example, both the Merlin Bird ID and BirdNET have over **1 million downloads on the Google Play App Store**. The competition of this marketplace is high, with services being subscription based or from paid apps. The increase of popularity in bird identification devices has even spilled over into many bird feeders, which include audio visual identification of birds without lifting your camera. This market is new and seemingly uncompetitive with only a handful of brands offering this product, yet, with high unit prices. **Our technology can be applied in these applications to allow for fast and accurate identification based on a wide range of photograph qualities.** This will allow users to have the satisfaction of knowing what their careful observation has found and continue to the thrill of the next hunt!

### DOCUMENTATION FOR TODAY, CONSERVATION FOR TOMORROW

Bird identification is additionally a crucial part of conservation. **With 3 billion lost since 1970 and 2/3rds of North American species at dire risk from climate warming, their survival depends on immediate action.** Identifying bird species requires a high amount of expert training but is critical for understanding the effects of global warming on birds' morphological traits and habitats shifts. This is particularly important for early detection (and future prevention) of mass bird deaths. Therefore, documenting the location and species of birds is paramount help decision-makers to take appropriate conservation actions to protect them from extinction. **With our model, a camera phone is the only other tool a citizen scientist would need to document rare or at-risk bird species spotted in their backyard.** Also, wildlife cameras can have the ability to identify and alert conservationists of critically endangered birds in the wild. Machine learning is a critical tool to aid in the fight against bird extinction events.