

Our project aims to contribute to the pool of computer tools which allow scientists to do their jobs more efficiently. We are proposing a system that would enable biologists studying moths to have a more efficient and streamlined process for collecting and understanding data. Currently biologists must gather and sort data entirely by hand, which presents significant limitations in that one person or team of people can only process a limited amount of data. We aim to assist in that field by creating a two part system of tools which streamlines the processes of collection, classification, and sorting of data regarding moths. The two portions to our project are as follows: a mobile application interface for submitting images of moths to the project, and a machine learning algorithm trained to identify and measure moths of different species. The completion of this project will enable biologists and others researching moth populations to spend more time focusing on the actual implications of the data and less time on processing large banks of raw information by hand.

Our project aims to help significantly decrease the number of working hours spent on processing and data that is collected in the field. We aim to do this by creating a mobile application which will allow users to submit photos for classification without any other work or steps involved. The mobile application will create a system whereby the submission of data is simple and as streamlined as possible. In addition to simplifying submission of images, the mobile application will also properly format data in order to allow the whole system to function more efficiently. Currently, a simple system for data submission and preprocessing simply does not yet exist in the field and, when completed, this system will greatly expand the pool of potential data available to biologists through crowdsourcing of data points. In addition to the mobile application, the project will also involve a machine learning algorithm which will be calibrated through multiple rounds of testing and reinforcement using previously obtained data in order to estimate which species of moth is present in an image. The process of machine learning will take place using data available and already understood, so as to ensure accuracy with species identified previously by biologists. Through the use of such an algorithm, our project will enable researchers in the field to track and identify certain species of moths through a simple photo, rather than having to painstakingly collect data in the field and analyze in a lab at a later point. This will allow for professionals in this field to be exposed to more data points, thus improving the accuracy of their research and predictions. This project's main objective, achieved through the tools described, is to streamline the efficiency and availability of systems for identification of moth species for biologists actively doing research in this field.

The completion of this project will permit the biologist community at large to more effectively research patterns in moth populations, which is becoming an increasingly important issue as the world deals with the onset of climate change. Through both a mobile application and a web based machine learning algorithm, our project will provide the utility of computers to the scientific community in an area where it is much needed. The sensitivity of moths ecologically has led them to be called an "indicator species" in some instances, which speaks to how important it is that biologists be able to monitor their populations across the world. This project will ensure that the evaluation of moth populations is a simpler process that is more accessible to researchers across the globe. Our project seeks to enable researchers to more effectively monitor the health of our environment. Instead of forcing people to complete a job that computers are much more suited for, our project will allow researchers to focus more on the substance of the data rather than its collection and processing.