One of the greatest benefits technology has brought to society is automation. The ability to make a task less labor intensive, less time consuming, and easier is invaluable. It allows a person or company to be more productive. In some cases, technology can find information humans are unable to detect. Another benefit of technology is that it creates uniformity. When humans are tasked with analyzing data, the information they collect might be messy and inconsistent. Websites and mobile apps allow people to view data in a consistent and clean manner. Thus, the goal of our project is to bring these technological advancements to a group of researchers that specialize in studying moths. They are in need of an easy to use tool that classifies the species and size of a moth in a picture.

Researching and analyzing moths answer many important questions regarding our environment and climate. First, moths indicate the health of an environment and ecosystem. According to The Guardian, moths pollinate flowers like bees do, and they make up most of the diet for certain birds and bats. According to The Science Times, researchers have noticed moths are getting smaller and migrating away from tropical environments due to the increase in global temperatures. Our application will be able to identify moths in different or new areas to determine the migration of moths. Scaling the application will expand the reach of data collection and moth identification. Thus, we believe that it is worthwhile to invest our time in building this technology for moth researchers, and we believe that it is worthwhile to invest your money in this cause due to the environmental impacts moth research has.

To achieve our goal of building this project, we have three major components that we will build. First is the user interface for our project. Our plan is to use a mobile application to provide users with an easy to use and intuitive interface. We want users to contribute to moth research, so we will allow users to take pictures of moths and have them be classified by our software. This reduces the labor requirement of the biologists. Our mobile application will allow researchers to have access to the same functionality as normal users, and we will also allow them to view and filter the crowd-sourced images of moths. They will also be allowed to manually classify moths due to their expertise. Crowd-sourced images of moths once the product goes live will allow moth researchers to have a free and continuing source of information.

Our final two components of this project will be creating artificial intelligence to automate the detection of moths in a picture and the identification of the species and the software that communicates with the mobile application. Our goal is to teach the artificial intelligence so it becomes capable of completing the tasks listed above while being able to generate an outcome almost instantly. By creating an artificial intelligence, we will be able to successfully automate the classification of moths and save researchers a significant amount of time since researchers such as Dr. John Pickering describe the process of classifying moths as laborious and time-consuming. In addition, we will need to create a program on the server that allows for communication between the mobile application and our artificial intelligence. We will also need a medium to store data and process user actions. Thus, our server will be key in integrating our project together while also providing timely and continuing support to our users.

This project will greatly reduce the amount of labor hours researchers will spend manually classifying moths. It will also allow average people to contribute to moth research and it will provide researchers with a free and large source of information. However, a significant impact is that this project can be applied to any field requiring the automation of data collection and classification. For example, this project can be applied to the collection of car data for law enforcement purposes. The possibilities with the results of these projects are endless and can be used for numerous purposes, not just moth research.

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