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 a form of consistency. When humans are tasked with analyzing data, the information they collect might be messy and inconsistent. It also may be hard to read especially when attempting to read someone's handwriting. This is where technology comes in. Front end interfaces such as 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.

As much as people think moths are nuisances, they are very important to our environment. First, moths indicate the health of an environment and ecosystem. Second, they are commonly used to teach children about nature and the life cycle of animals. They also provide scientific value as they are used to research pest control, evolution, genetics, and population dynamics. As a result of all these factors, 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.

To achieve our goal of building this project, we have three major components that we will build. The first component 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 the moth research community. Thus, we want to allow users to take pictures of moths and have them be classified by our software. This reduces the labor requirement of the researchers and allows them to focus on other things. 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 the machine learning models to detect moths in a picture and to identify the species of a moth and the server side software that sends and receives information from the mobile application. Our goal is to train models that are capable of completing the tasks listed above while being able to generate an outcome as fast as possible. By training and creating models, we will be able to successfully automate the classification of moths and save researchers a significant amount of time. In addition, we will need to create a program on the server that allows for communication between the mobile application and our machine learning models. We will also need a medium to store data and process user actions. Thus, our server or application programming interface (API) 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.