Group number: May 2020-10
Project title: Embedded Systems Machine Learning
Client: Dr. Diane Rover
Advisor: Dr. Diane Rover
Team Members: *Jackson Lopata, Isaac Stich, Eric Reusch, Frankie Mago,* Hailey Lucas, Christian Williams, and James Gossling.

---

o **Project Summary:** *(Short summary about the project. What are the design goals? Have the direction or scope of the project changed? This should be about a paragraph in length.)*

This project's main goal is implementing machine learning into the current ISU curriculum**.** Using machine learning we will implement a smart door lock capable of locking/unlocking doors once the appropriate keyword is uttered. The design goal is to train the keyword spotter with an accuracy of 90% or greater, meaning that the door functions correctly 90% of the time when the keyword is uttered. Another design goal is to have the locking mechanism finish its locking or unlocking state in under five seconds.

o **Accomplishments** *(Please describe/summarize as to what was done, by whom, when and, collectively as a group since the last report. This should be about a paragraph or two in length. Bulleted points are acceptable as well. Please keep only your technical details related to your project. Figures, schematics, flow diagrams, pseudocode, and project related results are acceptable, but please ensure that they are legible (clear enough to read) and to provide an explanation. If researching a topic, please add a few details about what was learned and how it is relevant to the project. If two or more people worked on a single task, be sure to distinguish how each member contributed to the task. Specific details relating to the assistance provided to other members may be included here.)*

1. Jackson Lopata
   a. Soldered all electrical components.
   b. Distributed components to team members.
   c. Finished modeling servo mount.
   d. Finished modeling DC motor mount.
2. Isaac Stich
   a. Read into some of the different data sheets for the different Peripherals for our system.
   b. Looked at the pinout for the arduino
   c. Began creating a spreadsheet for simplifying the readability of each peripheral's connection types.
3. Eric Reusch
   a. Parsing and determining usefulness of existing code for keyword spotter

b. Testing and implementation on one of group arduino
4. Frankie Mago
   a. Examined several datasets to use for synthetic data in our model, decided upon the Google Speech Command Dataset.
   b. Downloaded and setup python on personal computer, installed needed data curation scripts.
   c. Decided the final words to be used for our project ("House" and "Visualize"), set a target goal of 3705 samples recorded minimum. A quota will be established as needed.
5. James Gossling
   a. Helped get physical components to people who need them.
   b. Worked through example keyword inference code. Got a simple prototype working that articulates some peripherals (LED and speaker) on correct keyword recognition.
   c. Looked into the library to get a handle on how to get finer grain control of the library functions.
6. Haley Lucas
   a. Acquiring hardware
   b. Work on building motor library/ functionality.
7. Christian Williams
   a. Looked into hardware timers and datasheets of the arduino
   b. Looked into general and relevant libraries and functions of the arduino

o **Pending issues** We talked about how to go about getting a good amount of diverse data from ourselves and others, and need to talk with Dr. Rover about possibility of getting a mass email sent out for people to send us voice data. We need to figure out how to get fine grained control of the machine learning library.

o **Advisor Input/Signature:**
   Please select one of the options below and sign.
   ___x____ I am pleased with the progress the team is making.
   _____ The teams progress could use some minor improvements which I will discuss with them.
   _____ The team's progress has some major concerns that I will discuss directly with Dr. Bigelow
   bigelow@iastate.edu , 515-294-4177

   Signature: Diane T. Rover
   _____

o **Client Input/Signature:**
   Please select one of the options below and sign.
   ___x____ I am pleased with the progress the team is making.
   _____ The teams progress could use some minor improvements which I will discuss with them.
   _____ The team's progress has some major concerns that I will discuss directly with Dr. Bigelow
   bigelow@iastate.edu , 515-294-4177

Signature: Diane T. Rover

_____