

AI on low cost camera for counting and classification of microbes in nature water

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PROBLEM

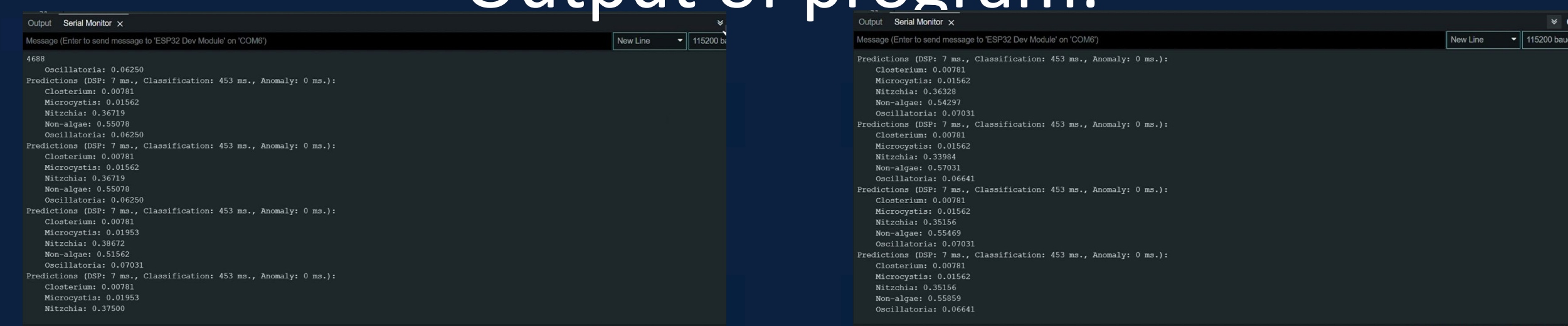
There are lots of different algae types and it can be difficult to identify the different ones when gathering samples in the field, this project aims to create a model that overlays into a chipset in order to identify different algae species via a microscope and camera.

SYSTEM DESIGN

This project utilizes a microscope with an ESP32 camera attached to the viewing lens to analyze live samples of algae in order to make a species classification prediction. The ESP32 Camera is attached to a chipset which has a neural network model loaded onto it built through edge impulse, the model also has been provided with significant training data in the form of already classified images of algae.

VERIFICATION

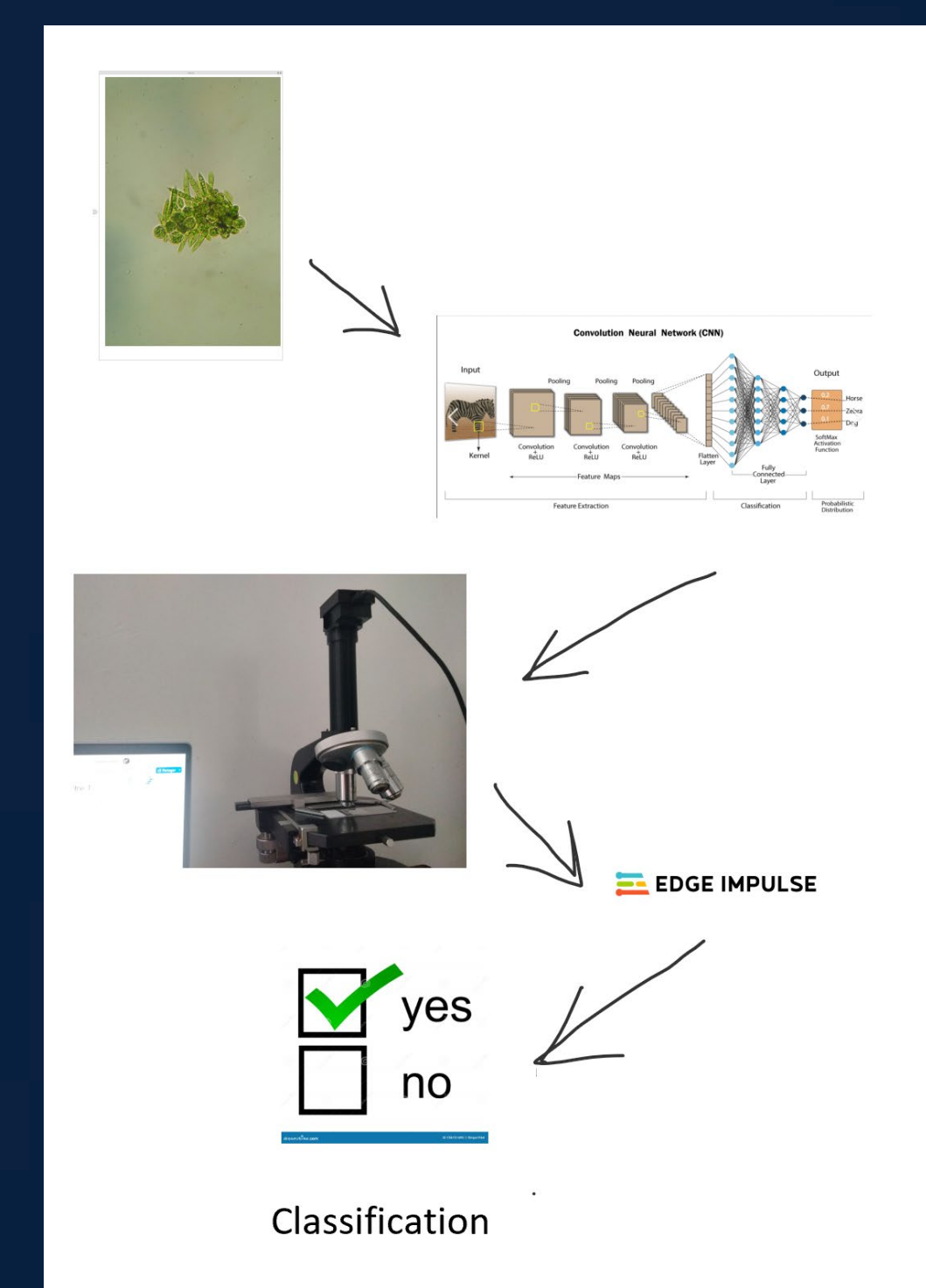
Output of program:



CURRENT SYSTEM



OBJECT DESIGN



SUMMARY

This project was designed to streamline the process of algae identification and also provide a validation source for a researcher working out in the field. This uses a neural network model on edge impulse to classify algae through a microscope with a esp32 camera and chipset.

REQUIREMENTS

- Microscope
- ESP-32 Camera and chipset
- Arduino IDE
- Edge Impulse
- ExpressIf Library

IMPLEMENTATION

- ESP-32 Camera and ESP-32 Development Board
- A windows laptop 64 bit operating system (x64 based processor)Storage - 256 GBMemory - 12 GBProcessor - Intel(R) Core(TM) i5-10210U CPU @ 1.60GHz 2.11 GHz
- Arduino IDE
- Nikon Light Microscope

REFERENCES

<https://www.edgeimpulse.com/>
<https://github.com/CIS495algaeAI>