Engineering Design

Design Content

Three modules to be developed:

- User Interface
- Cloud Server
- Database

Design Complexity

Multiple Components/Subsystems:

1. Database: Contains all the images for training the model
2. Cloud Server: Contains the Deep Learning A.I.
3. User Interface: Sends input images and receives output from the cloud server
4. Model(neural networks): Structure of the A.I.
5. Website: Website for users to read, send images, and receive results

Controller: Communicates between modules and controls the flow

Modern Engineering Tools

1. Keras.io: Used to run models to get familiar with simple AI models
2. Cloud: Used for setting up the AI environment

Design Context

Area	Description	Examples
Public health, safety, and welfare	Our project impacts any person who may have skin cancer as well as doctors by giving them a less invasive option to identify skin cancer.	Reduces need for invasive procedures.
Global, cultural, and social	People who live in regions that get more sun may be more impacted by this project.	People closer to the equator may get more sun than those who live further away.
Environmental	Our project could contribute to climate change by burning fossil fuels and increasing greenhouse gasses.	Since AI uses a lot of computing, it uses a significant amount of energy.
Economic	Our project could decrease the financial responsibility of patients and insurance providers.	Our project provides a non-invasive method of diagnosing skin cancer, which is generally less expensive.

Prior Work/Solutions

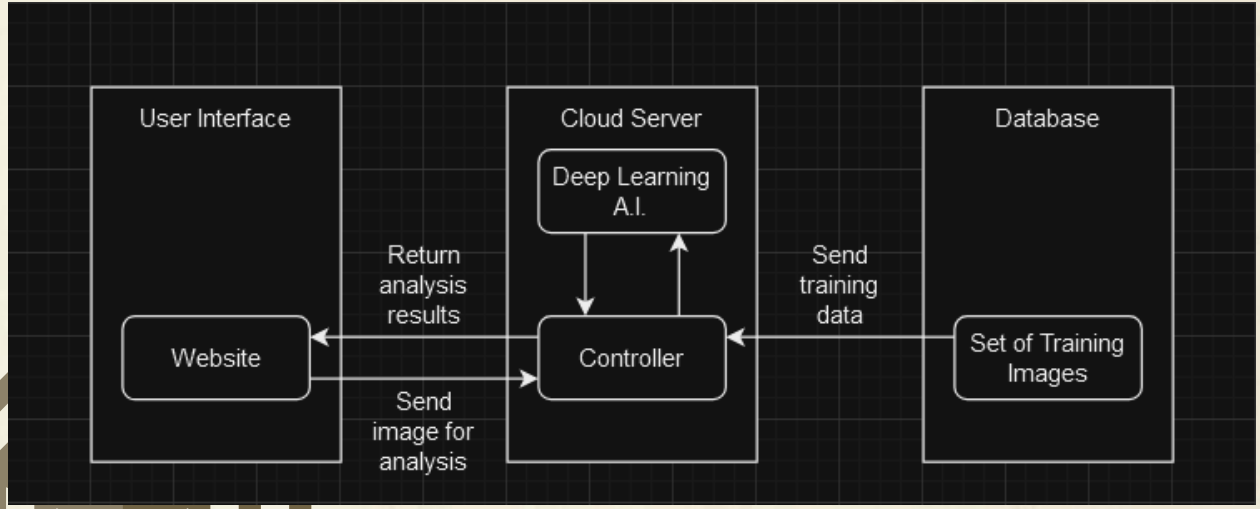
1. Currently there are numerous AI models available and specifically there are already existing AI models that are able to detect cancer.

2. We will be using existing models to create our model.

3. The shortcoming that current models face that we hope to address with our model is accessibility.

4. We will be using cloud computing to help make our model available to a wider range of people.

Design


User Interface
Website
Cloud Server
Deep Learning A.I.
Controller
Database
Set of Training Images
Return analysis results
Send image for analysis
Send training data

Design: Functionality

Our design will operate on a computer or handheld device. A healthcare professional will upload a photo of an area of skin, and the application will say whether or not it predicts skin cancer is present in the area.