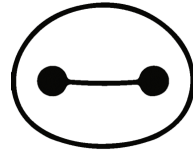


Baymax

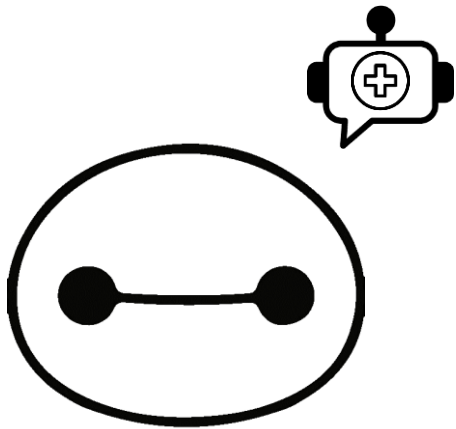


Your AI Medical Assistant

- Casey Colins
- Steven Dao
- Maria Hernandez
- Jordan Huff
- Vineeth Konjeti
- Amal Sam
- Jonathan Tran

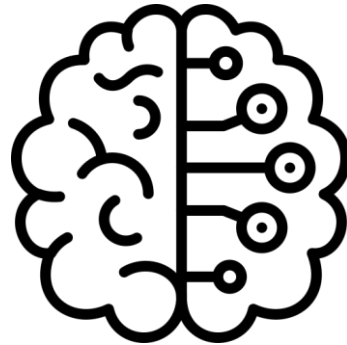
Overview

The Product



Healthcare Chatbot

General guidance on health and wellness



Powered by A.I.

Integrated ChatGPT 4 responses



Referral to Professionals

Location-based doctor referrals



User Friendly Design

Focus on ease of use and accessibility

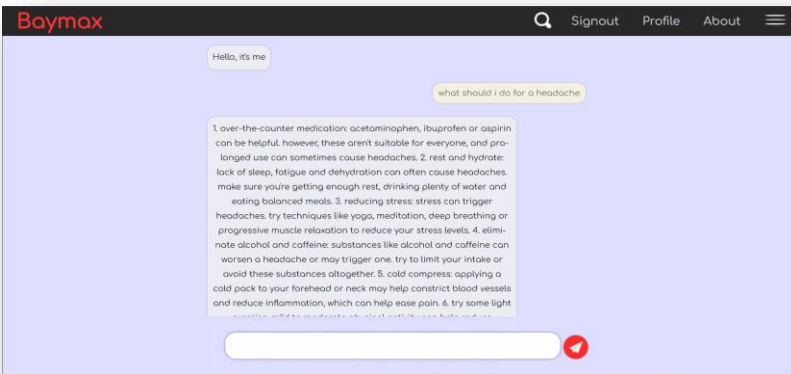
Overview

The Purpose

- **Navigating Complex Medical Information** – Too much complex data for the average person to understand
- **Initial Health Consultation Hesitancy** – People are hesitant to ask for help
- **Personalized Health Information Search** – Challenges in finding specific information relevant to personal health needs

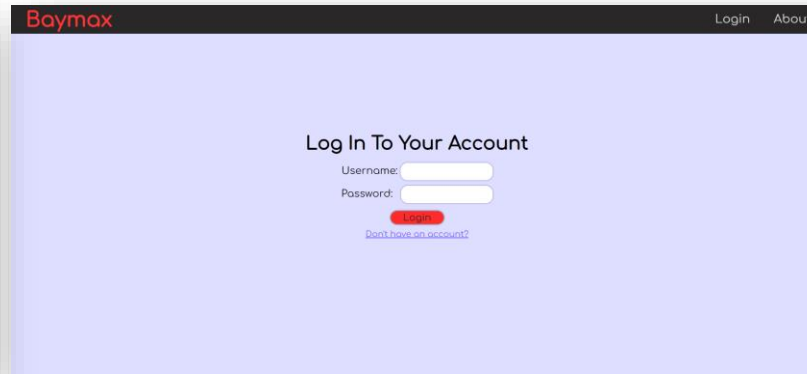
Front-End

Page Layout



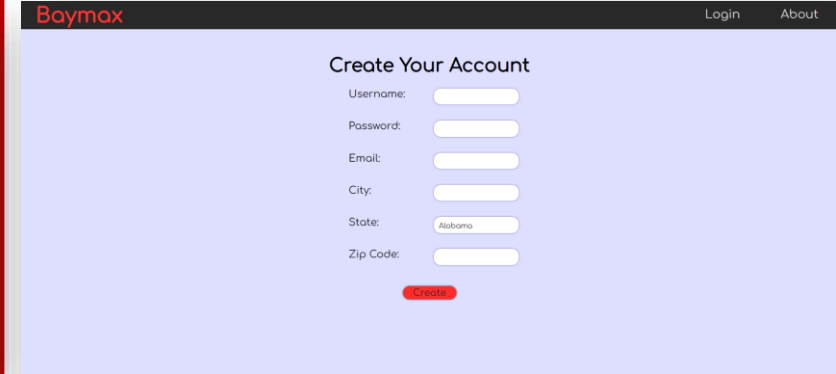
Chat Page

- Communicate with the AI
- Only accessible with an account



Log In

- Log in to your account
- Has access to account creation page

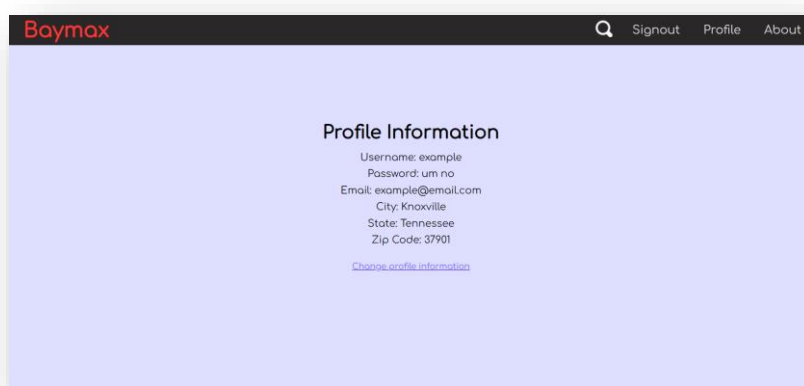


Create Account

- Users input username and password
- Includes basic information (email, city, etc.)

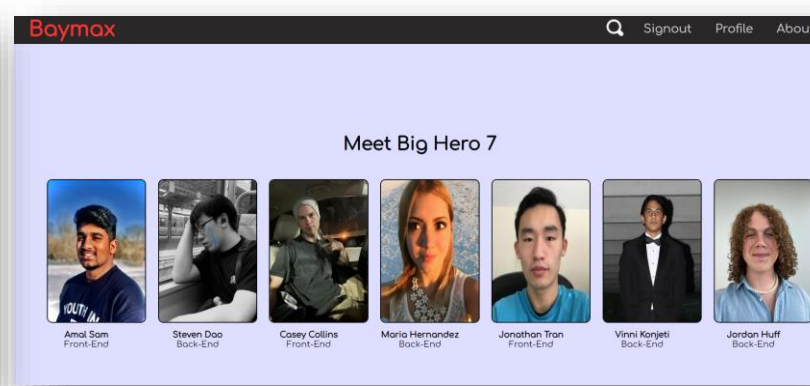
Front-End

Page Layout (cont.)



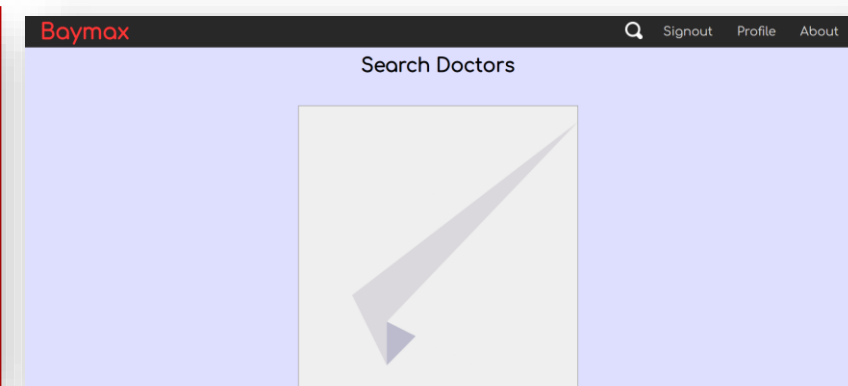
Profile

- View your profile information
- Can change your profile information



About

- Illustrates all members of the project and their general role

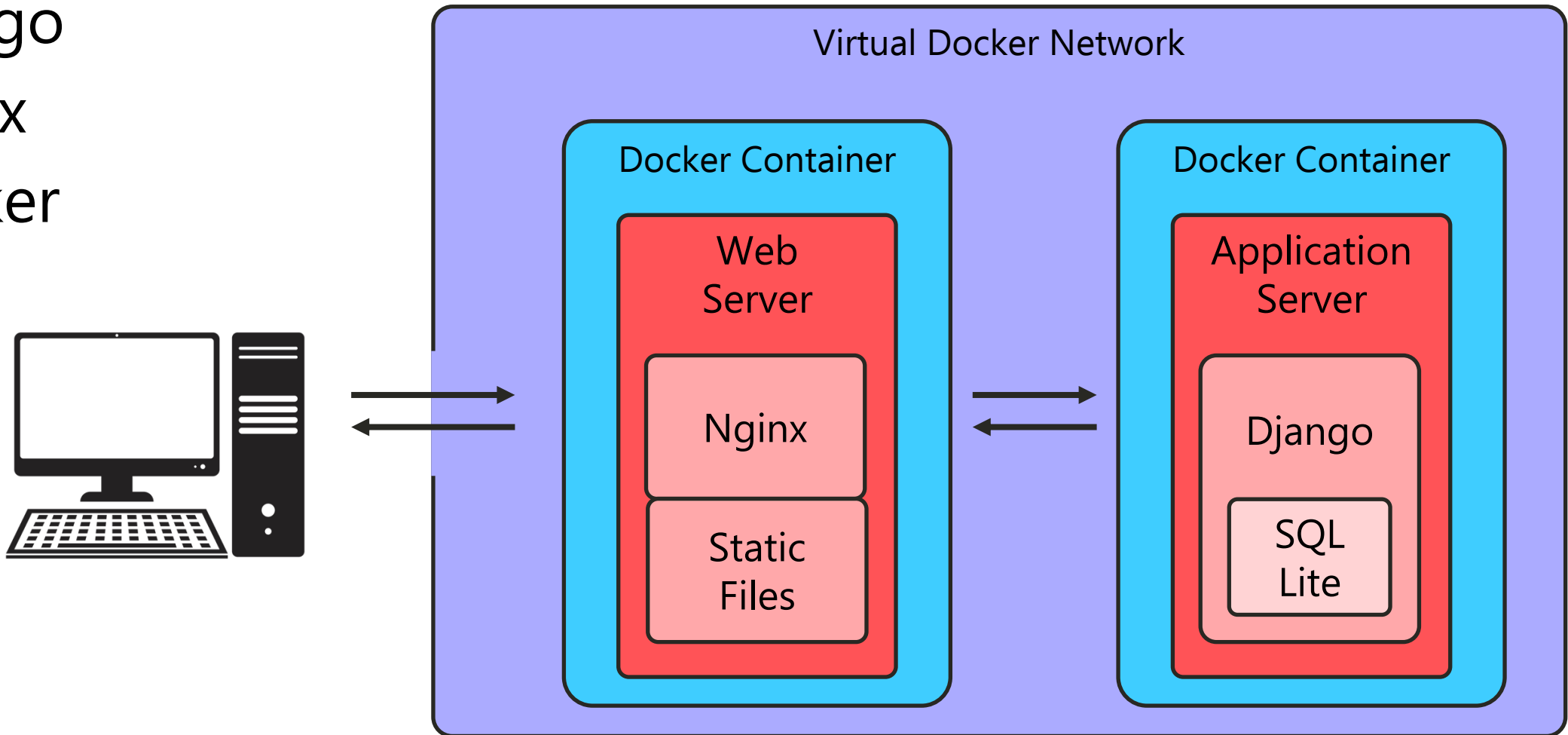


Search

- In progress...
- Allows users to search for doctors directly

Application Architecture

- Django
- Nginx
- Docker

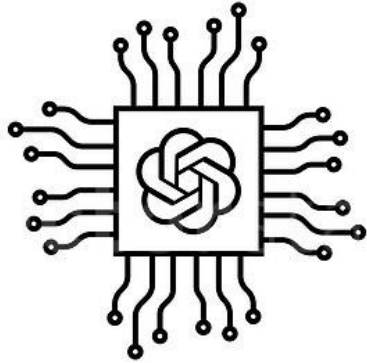


Application Server

- Dynamic Page Generation
- Host API Endpoints
 - Database Interface
 - Response Generation
- Handle User Authentication

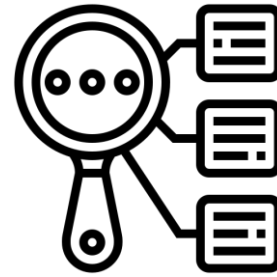
Machine Learning

Core Features



Prompt-Response Pipeline

- Integration of **ChatGPT 4**
- **Input** user prompt
- **Output** medical response
- Search response for **keywords**

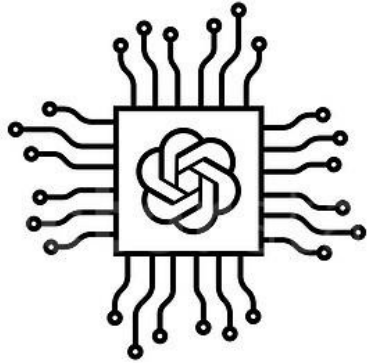


ANN Input Classification

- Directs **users** to **specialists** when **keyword** isn't found
- **Input** user prompt
- **Output** medical taxonomy code

Machine Learning

Core Features



Prompt-Response Pipeline

- Integration of **ChatGPT 4**
- **Input** user prompt
- **Output** medical response
- Search response for **keywords**

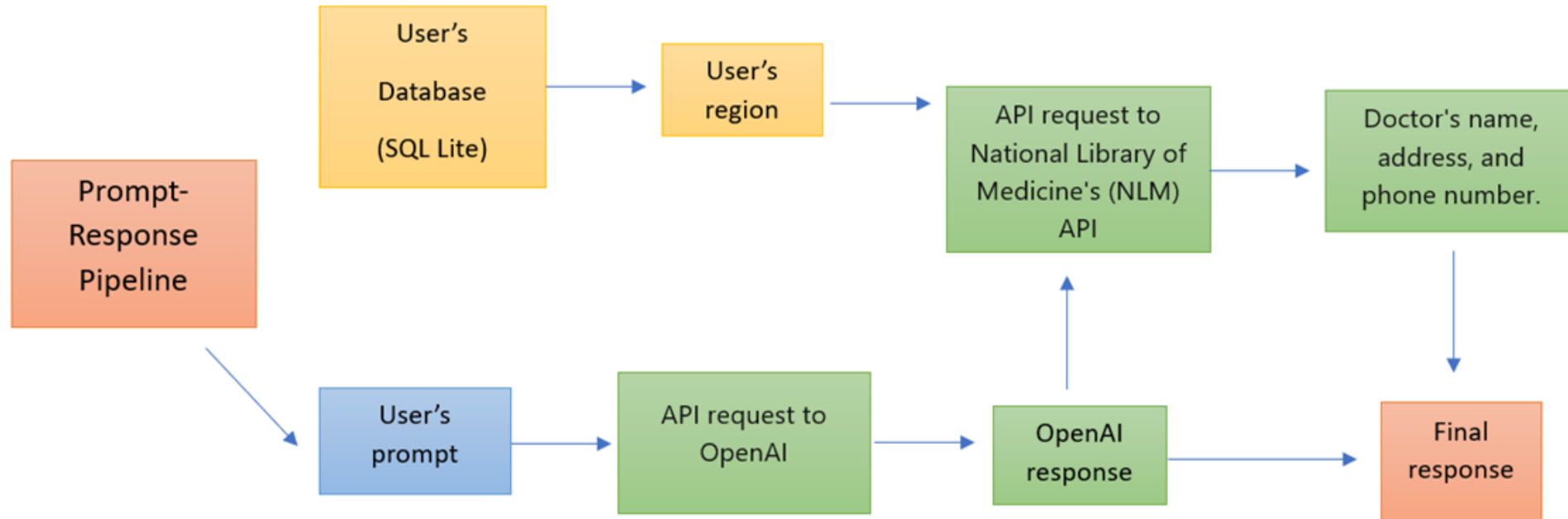
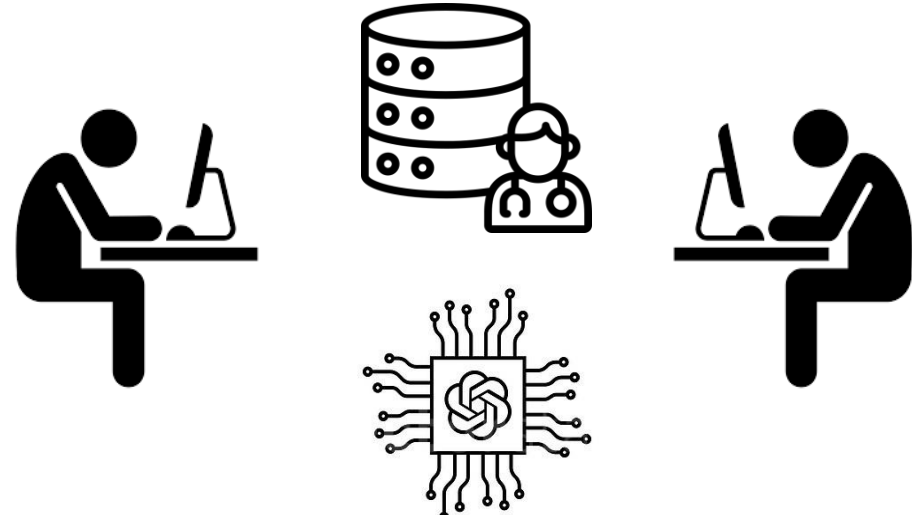


ANN Input Classification

- Directs **users** to **specialists** when **keyword** isn't found
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- **Output** medical taxonomy code

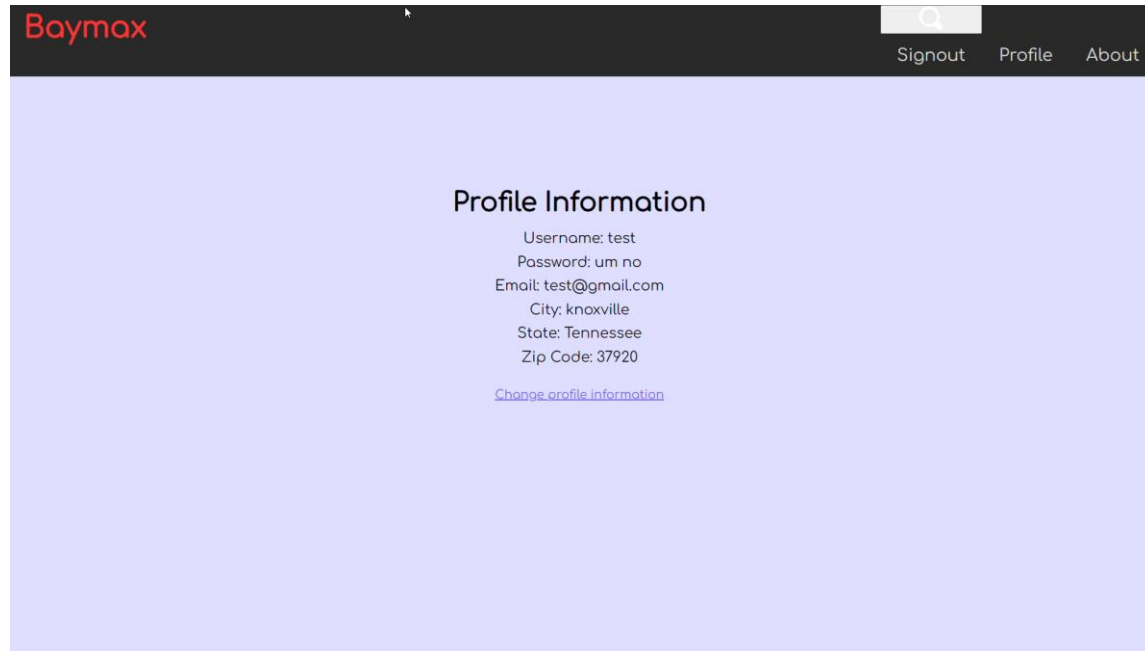
Machine Learning

Prompt-Response Pipeline

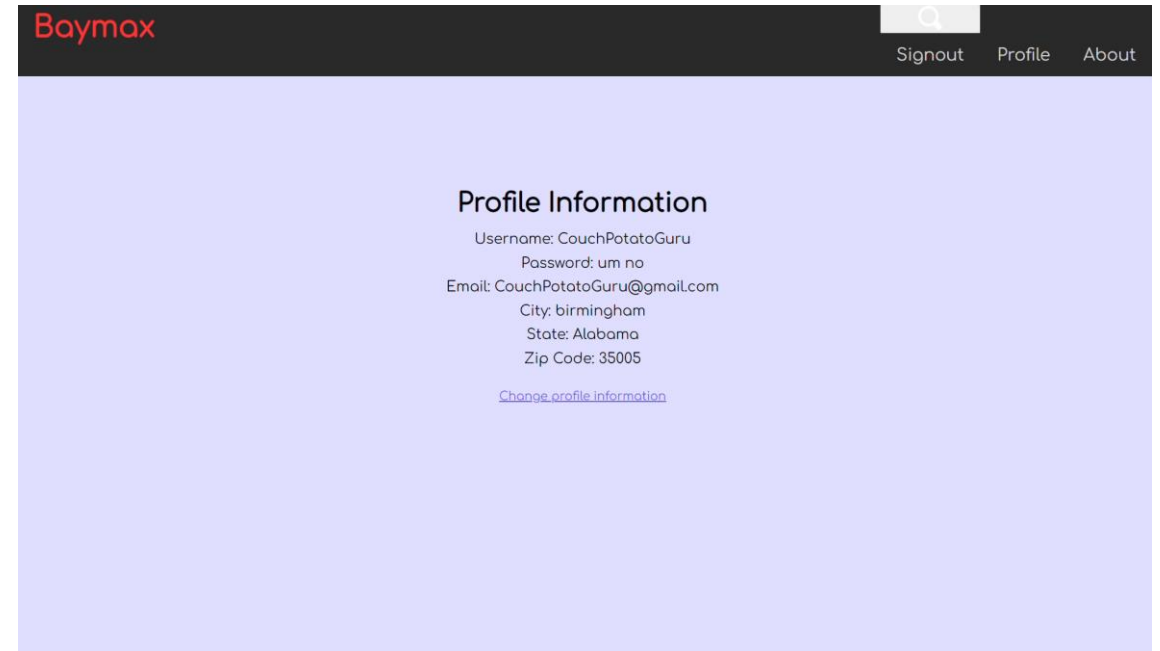


Examples

User from Knoxville

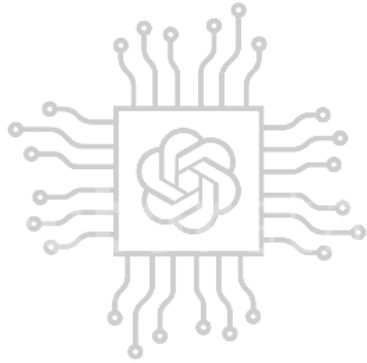


User from Birmingham



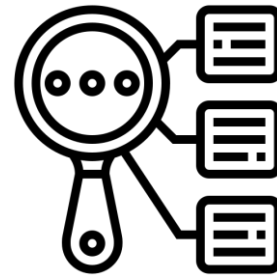
Machine Learning

Core Features



Prompt-Response Pipeline

- Integration of **ChatGPT 4**
- **Input** user prompt
- **Output** medical response
- Search response for **keywords**

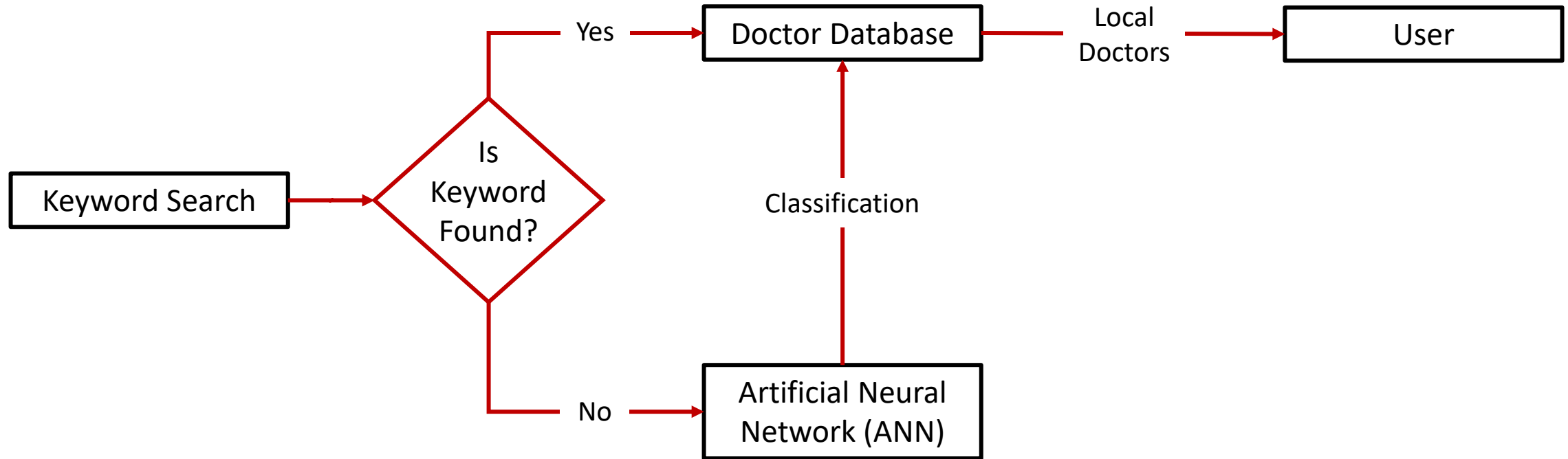


ANN Input Classification

- Directs **users** to **specialists** when **keyword** isn't found
- **Input** user prompt
- **Output** medical taxonomy code

Machine Learning

Text Classification



Machine Learning

Text Classification

- **Machine Learning Model**
 - Artificial Neural Network (ANN)
 - Multi-class classification
- **Supervised Data**
 - ChatGPT-generated medical questions
 - ~2000 prompts for testing and training
- **Results**
 - 95.3% accuracy for 4 classes

Model: "sequential_5"

Layer (type)	Output Shape	Param #
=====		
embedding_2 (Embedding)	(None, None, 16)	160016
dropout_4 (Dropout)	(None, None, 16)	0
global_average_pooling1d_2 (GlobalAveragePooling1D)	(None, 16)	0
dropout_5 (Dropout)	(None, 16)	0
dense_2 (Dense)	(None, 4)	68
=====		
Total params: 160,084		
Trainable params: 160,084		
Non-trainable params: 0		

Machine Learning

Text Classification

```
[152]: # Label 0 corresponds to dermatology
# Label 1 corresponds to neurology
# Label 2 corresponds to optometry
# Label 3 corresponds to podiatry

examples = [
    "Why is my skin itchy and red?",
    "How are movement disorders like dystonia different from tremors?",
    "How can I protect my eyes from chlorine in swimming pools??",
    "What can I do to improve foot mobility?"
]
export_model.predict(examples)

1/1 [=====] - 0s 45ms/step
[152]: array([[7.3278046e-01, 3.0530887e-02, 4.0225532e-02, 1.9646315e-01],
 [2.5990051e-03, 9.7166598e-01, 1.1738650e-02, 1.3996400e-02],
 [2.1568153e-03, 7.6684816e-04, 9.9640048e-01, 6.7588332e-04],
 [2.4243279e-03, 1.5803892e-03, 1.3231016e-04, 9.9586296e-01]],
 dtype=float32)
```

		Input Prompts			
		Q1	Q2	Q3	Q4
Model Prediction	Dermatology	73.3%	0.3%	0.2%	0.2%
	Neurology	3.1%	97.2%	0.1%	0.2%
	Optometry	4.0%	1.2%	99.6%	0.0%
	Podiatry	19.6%	1.4%	0.1%	99.6%

Challenges

- Working with HTTP (API Requests)
 - Session-based Authentication Protocol over HTTP
- Mid-semester Architecture Changes
- Loss of NHS-LLM Model

Questions?

Baymax 
Your Personal Healthcare Assistant

Overview

- **AI-Based Health Assistant:**
 - A specialized version of ChatGPT focused on providing health-related information
- **General Health Advice:**
 - Capable of offering general guidance on health and wellness topics (not a substitute for professional medical care)
- **Referral to Medical Professionals:**
 - Ability to direct users to appropriate healthcare providers based on the user's region
- **Accessible and User-Friendly:**
 - Designed to be easy to use, providing clear and understandable health information

Machine Learning

LLM Integration

