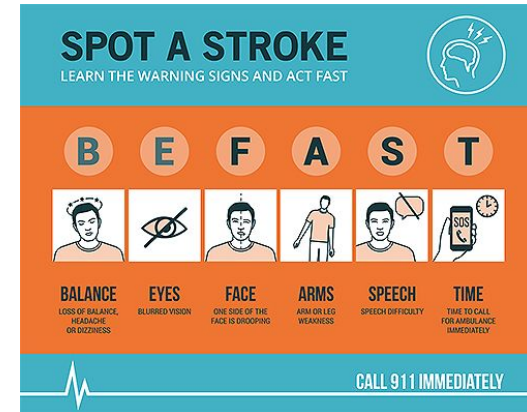
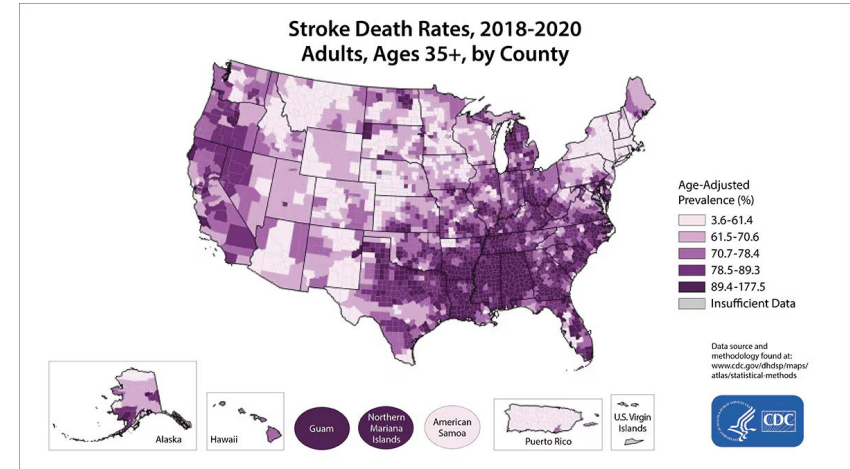


Stroke Detection

Chaitanya Padamata, Karthik Chellamuthu, Michael Dang

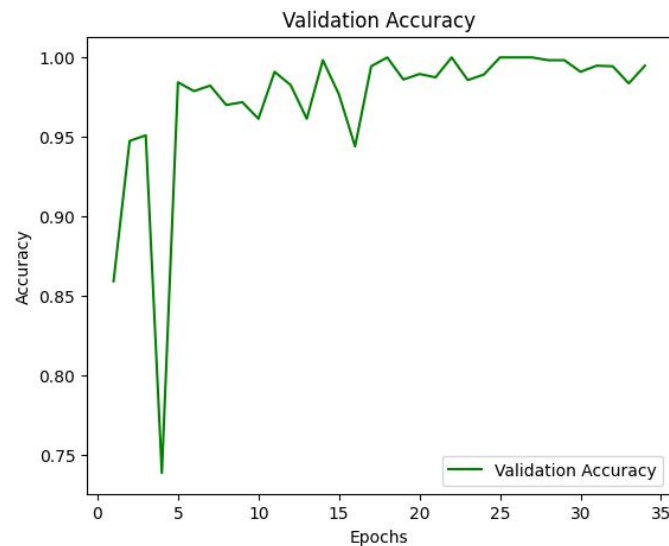
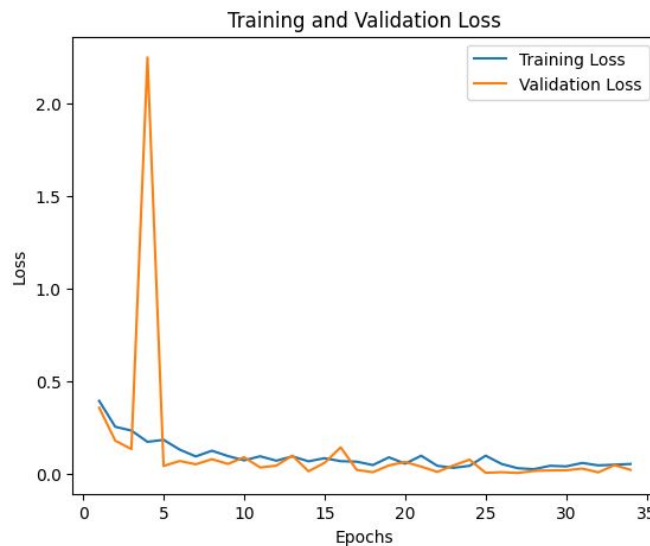
Summarize

- **Motivation:** Early action is **crucial** in stroke cases, as the chances of survival significantly increase with immediate emergency treatment.
- **Problem Statement:** Stroke is a medical emergency where delayed treatment can lead to severe disability or death. Many victims do not receive timely treatment due to delays in recognizing symptoms and accessing emergency care.
- **Proposal:** The recent advancements in AI and machine learning present an opportunity to develop a platform that can detect potential strokes early.



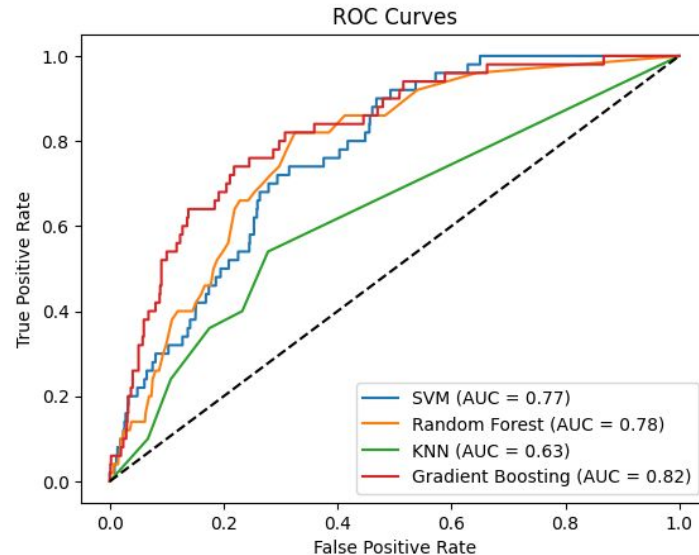
Residual Network

- ResNet50 for facial stroke prediction with **98.37%** of accuracy over 3770 images consists of two classes: **stroke** and **no stroke** where data augmented techniques were used.
- Model performance:



Random Forest

- For stroke prediction based on medical history data, the Gradient Boosting model achieved an accuracy of **81.95%**, outperforming other models such as K-Nearest Neighbors (KNN), Support Vector Machine (SVM), and Random Forest.
- The dataset used for training was imbalanced, with more non-stroke cases than stroke cases; hence, SMOTE was applied.
- Model performance:



Multimodal

- To enhance the performance of your stroke prediction system, you're combining the predictions from two models: **ResNet50** (trained on facial images) and **Gradient Boosting** (trained on medical history).
- The combined multimodal approach assigns a **60% weight to the ResNet50 predictions** and **40% to the Gradient Boosting predictions**, reflecting the importance of both image-based and medical data in stroke detection.

$$P_{final} = 0.6 \cdot P_{ResNet50} + 0.4 \cdot P_{GradientBoosting}$$

User Interface

Medical History



Age:

Hypertension:

Heart Disease:

Heart Rate:

BMI:



No prediction yet

Personal History

Ever Married:

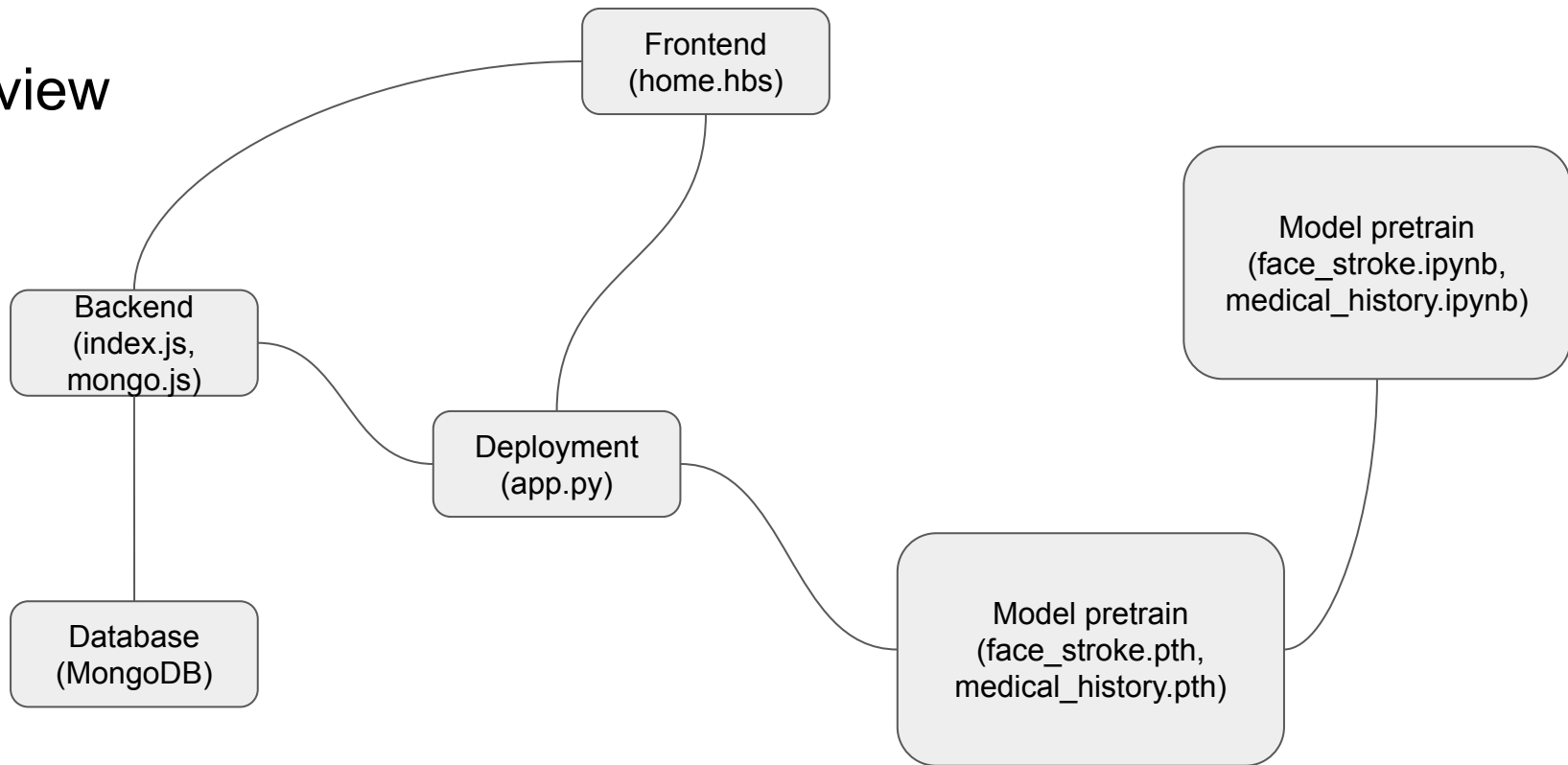
Work Type:

Residence Type:

Smoking Status:

Avg Glucose Level:

Overview



Challenges

- Trouble connecting multimodal with frontend (data format mismatch, API communication)
- The UI camera doesn't work
- Limited to LLM integration

Future work

- Fix the data format and ensure API is working well
- Improve UI with camera available
- Incorporate LLM into the platform
- Set an emergency switch when the predict above 95% chances of having stroke.

```
(venv) micho2@LongDang:~/Desktop/UWKC_DS_Capstone/backends$ python Get_nearby_er.py
[{"name": "The University of Kansas Hospital Emergency Department", "address": "4000 Cambridge St Level 1, Kansas City", "rating": 1.8, "user_ratings_total": 125, "location": {"lat": 39.056753, "lng": -94.6088515}},
{"name": "University Health Emergency Department & Trauma Center", "address": "Main Hospital, 2301 Holmes St 1st Floor, Kansas City", "rating": 2.3, "user_ratings_total": 6, "location": {"lat": 39.0844906, "lng": -94.57525299999999}},
{"name": "Truman Medical Center-Hospital Hill 2 Center", "address": "Kansas City", "rating": 5, "user_ratings_total": 4, "location": {"lat": 39.0842537, "lng": -94.5728816}},
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{"name": "KU Medical Center", "address": "3901 Rainbow Blvd, Kansas City", "rating": 3.3, "user_ratings_total": 164, "location": {"lat": 39.0559981, "lng": -94.6091411}},
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{"name": "University Health 1", "address": "2101 Charlotte St #330, Kansas City", "rating": 3.3, "user_ratings_total": 10, "location": {"lat": 39.0866075, "lng": -94.5742598}},
{"name": "KU Hospital Dr Khan", "address": "4000 Cambridge St, Kansas City", "rating": 3, "user_ratings_total": 3, "location": {"lat": 39.0558428, "lng": -94.6090358}},
{"name": "Children's Mercy Adele Hall Campus", "address": "2401 Gillham Rd, Kansas City", "rating": 3.9, "user_ratings_total": 819, "location": {"lat": 39.08387889999999, "lng": -94.5771759}},
{"name": "The University of Kansas Health System Medical Pavilion", "address": "2000 Olathe Blvd level 5 Suite D, Kansas City", "rating": 0, "user_ratings_total": 0, "location": {"lat": 39.0546157, "lng": -94.6087}},
{"name": "KU", "address": "3900 Cambridge St, Kansas City", "rating": 0, "user_ratings_total": 0, "location": {"lat": 39.057683, "lng": -94.6083901}},
{"name": "Statland", "address": "3599 Rainbow Blvd, Kansas City", "rating": 0, "user_ratings_total": 0, "location": {"lat": 39.0611487, "lng": -94.6121553}}]
(venv) micho2@LongDang:~/Desktop/UWKC_DS_Capstone/backends$
```

You have Docker installed
Install the recommended

Thank you