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SAM Healthcare: Disease Prediction

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Project Guide
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Contents

- **Introduction**
- **Objectives**
- **Scope**
- **Literature Survey**
- **Proposed System**
- **Project Outcomes**
- **Block Diagram**
- **Use Case/DFD**
- **Technology Stack**
- **Suggestions in Review-1**
- **Result and Discussion**
- **Conclusion and Future Scope**
- **References**

1. Introduction

- SAM Healthcare is a system that is used to predict the diseases like Brain Tumor, Pneumonia, and skin disease via Images of MRI, Chest X-ray which are given by the patients or any user and helps doctor to predict disease accurately.
- The system processes the images provided by the user as an input and gives output as the probability of disease.

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➤ **Problem Identified :**

- A period of time is consumed to identify the disease.
- Less accuracy in conventional methods.
- People in underdeveloped regions are unable to connect doctors at early stage of disease.

➤ **Solution Proposed :**

- Disease prediction is accomplished using images or x-rays via ML models
- The Project focuses on saving life of peoples , by saving time , human errors and by early prediction of diseases or infection.

2. Objectives

- The primary objective of a disease prediction system is to identify the disease at an early stage
- To achieve high accuracy, sensitivity, and specificity in predicting disease.
- To be scalable and able to handle a large volume of patient data.
- To adhere to the privacy regulations and ensure the protection of patient data.

3. Scope

- Clinical Decision-Making: Disease prediction systems can provide healthcare providers with valuable insights that can inform clinical decision-making.
- Personalized Health Monitoring: A disease predicting app can provide patients with personalized health monitoring.
- Research: Disease predicting apps can provide valuable data for research

4. Literature Survey

Sr.no	Title	Author (s)	Year	Algorithms	Limitations	Result
1.	Disease Prediction Application Using Machine Learning : MEDSCAN	Sahil Sandhu	2022	NET algorithm is used in Brain Tumor Prediction and Corona Prediction, ResNet is used in Retino Pathy, CNN is used in Malaria prediction, ImageNet is used in Normal Chest X – Ray.	Focuses on some specific diseases. Lacks accuracy in prediction model.	The paper aims to evaluate previous disease prediction efforts, explore disease evaluation and technology implementation in medicine
2.	Mobile Application Development for Disease Diagnosis based on Symptoms using Machine Learning Techniques	Anirudh Sridhara, Ahmed Mawiaa , A L Amuthaa	2023	Data preprocessing is done and then the data is passed through various machine learning classification models, like K Nearest Neighbor, Support Vector Machine, Decision Tree, Random Forest Classifier, Naïve Bayes and Artificial Neural Network.	Lacks in accuracy. No use of Image classification user has to manually select symptoms	The output vectors of all the models, and this has yielded a training accuracy of 98.9% and when the model was tested on test data it yielded an accuracy of 98.08%.

Continue...

Sr.no	Title	Author (s)	Year	Algorithms	Limitations	Result
3.	Disease Prediction Application Using Machine Learning	Arnab Das , A. Udith Sai , P. Asha	2022	System focuses on the prediction of three most deadly disease heart disease and breast cancer using Random Forest Classifier and diabetes diseases using Logistic Regression	Focuses on only three diseases. Lacks in accuracy. No use of Image classification user has to manually select symptoms.	The output vectors of all the models, and this has yielded a training accuracy of 96.4% and when the model was tested on test data it yielded an accuracy of 97.3%.

5. Proposed System

- User Authentication :

User can authenticate themselves using their phone number.

- Brain Tumor & Pneumonia detection:

Brain Tumor and Pneumonia are detected by getting the input in form of MRI and Chest X-ray from the user.

- User- friendly Interface:

User can easily understand and navigate the application in efficient way.

6. Outcome of Project

- User can identify the disease at an early stage.
- User can achieve high accuracy, sensitivity, and specificity in detecting disease.
- System is scalable and able to handle a large volume of patient data.
- User's data remain protected and adhered to privacy regulations.

7. Block Diagram

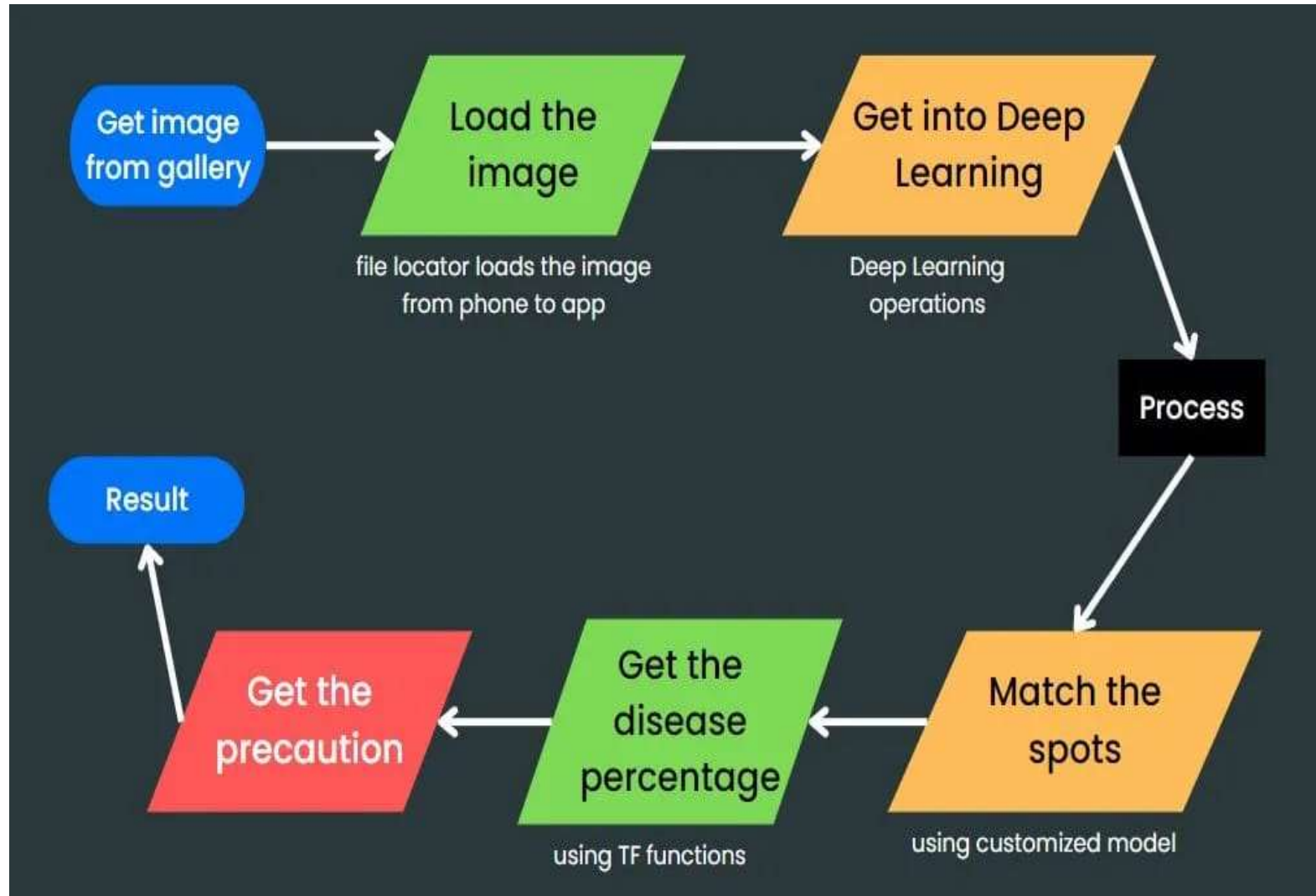


Fig 7.1 Block Diagram

8. Use Case Diagram

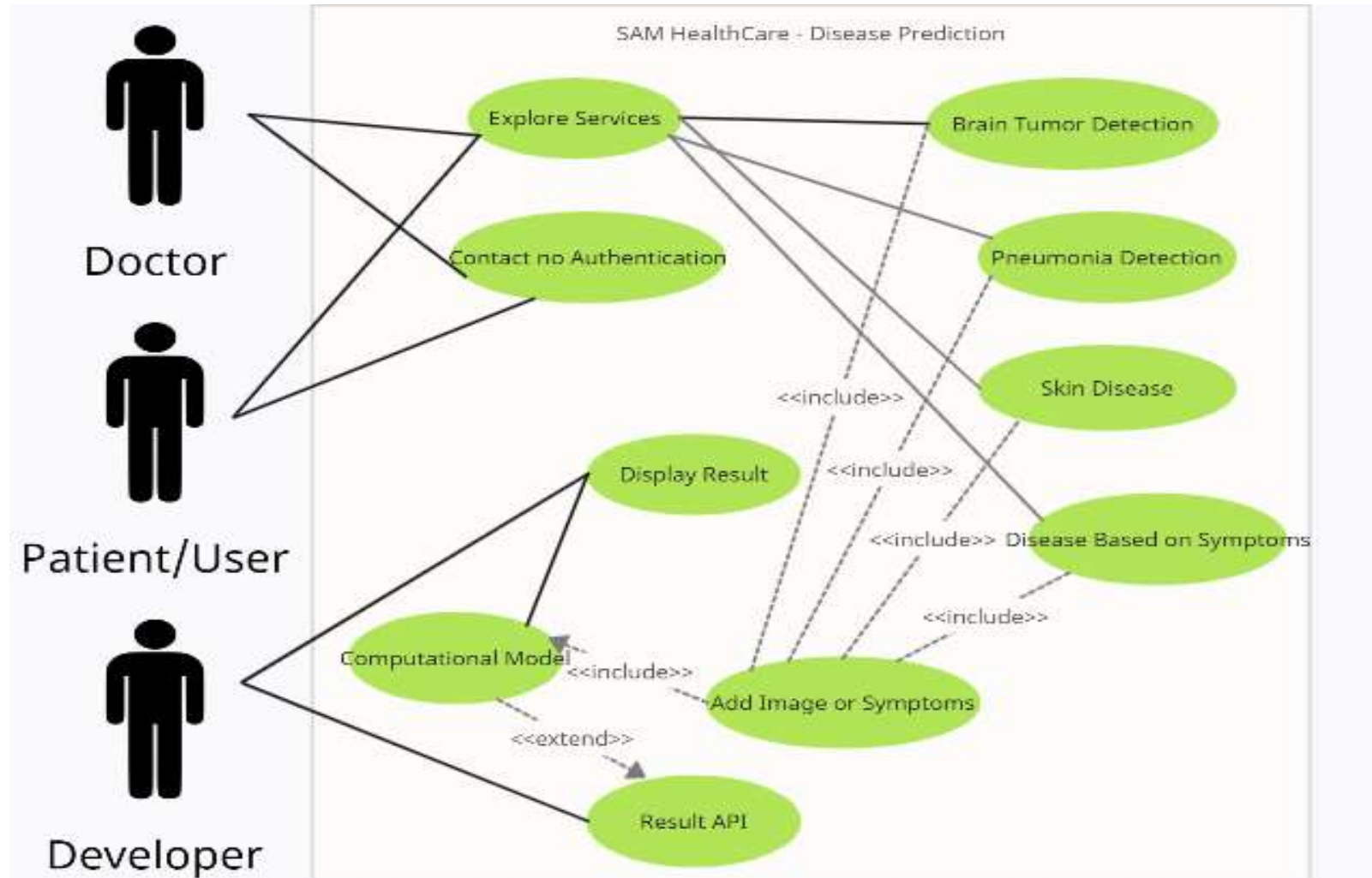


Fig 8.1 Use Case Diagram

9. Technology Stack

Frontend:

- Flutter - For Building the GUI and overall application structure

Backend:

- Firebase - For handling user authentication, data storage and hosting backend of app.
- Flask - For building the backend server that communicates with TensorFlow model.

Programming:

- Dart
- Python
- TensorFlow & keras
- Pandas
- Scikit-learn

Platform:

- Android Studio
- Google Colab/Jupyter Notebook

10. Suggestions in Review-1

- Proper GUI
- Using Table format to write Literature review

11. Result and Discussion

- SAM Healthcare is a promising tool for early detection and diagnosis of various diseases, including brain tumor and pneumonia.
- The system uses deep learning techniques to classify medical images into different categories based on the patterns and features present in the images.
- The performance of the system is dependent on the quality and quantity of the input data used for training and testing the CNN algorithm.
- The accuracy of the system is 98.16%

12. Conclusion and Future Scope

- SAM Healthcare has the potential to revolutionize remote healthcare by providing patients with a quick and accurate diagnosis of their conditions.
- By leveraging advanced machine learning algorithms and image processing techniques, the application can analyze patient images and predict potential diseases with a high degree of accuracy.
- Application could be expanded to include telemedicine features, enabling patients to connect with healthcare professionals remotely for video consultations and follow-up appointments.

References

- ▶ Sahil Sandhu, “Disease Prediction Application Using Machine Learning : MEDSCAN” International Journal of Advanced Research in Science, Communication and Technology (IJARSCT) Volume 2, Issue 6, June 2022
- ▶ Anirudh Sridhara , Ahmed Mawiaa , A L Amuthaa, “Mobile Application Development for Disease Diagnosis based on Symptoms using Machine Learning Techniques” International Conference on Machine Learning and Data Engineering
- ▶ Arnab Das , A. Udith Sai , P. Asha, “Disease Prediction Application Using Machine Learning” International Journal for Research in Applied Science & Engineering Technology (IJRASET) ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538 Volume 10 Issue III Mar 2022
- ▶ <https://developer.android.com/docs>
- ▶ <https://www.who.int/data/gho/data/themes/topics/topic-details/GHO/world-health-statistics>
- ▶ D. S. Patel and D. D. Patel, "A survey on detection of brain tumor using MRI images," 2016 3rd International Conference on Computing for Sustainable Global Development (INDIACom), New Delhi, India, 2016, pp. 2385-2390, doi: 10.1109/INDIACOM.2016.7720152.