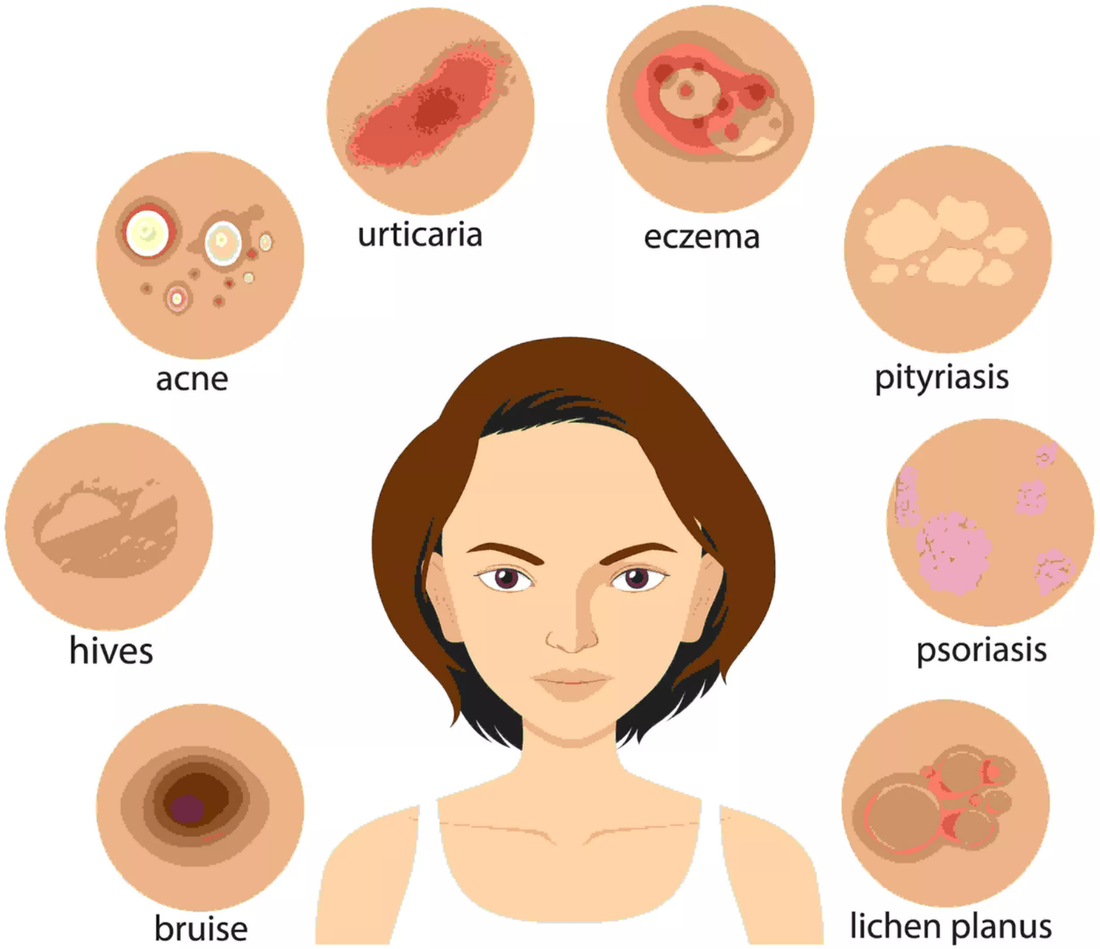
Maharishi Markandeshwar Engineering College

Affiliated to Maharishi Markandeshwar (Deemed to be University)

Team EliteByte

Presents

DiagnoScan



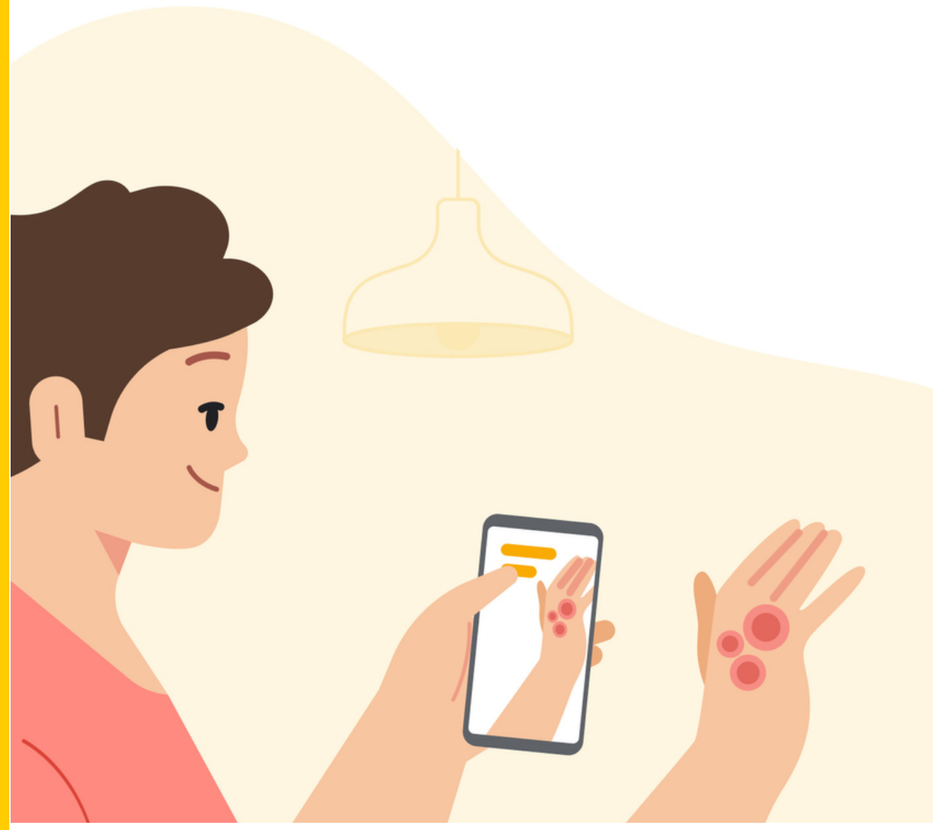
PROBLEM STATEMENT

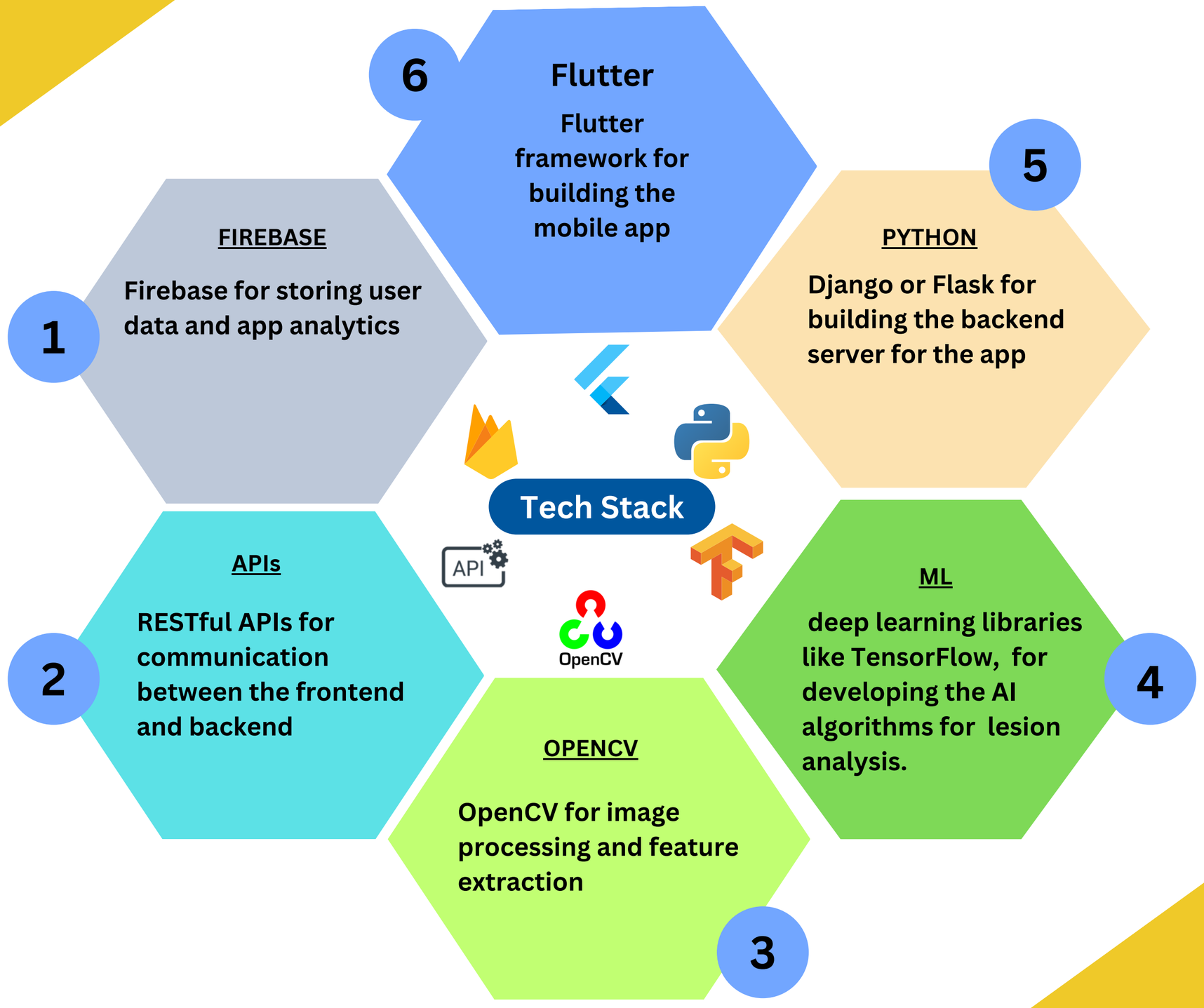
The incidence of **skin cancer and body lesions** are increasing, with 2-3 million new cases diagnosed annually according to **WHO**. The majority of people are not familiar with the warning signs, which can result in delayed medical assistance. In addition, **there is a lack of access to healthcare, and inaccurate self-diagnosis is common**. These issues contribute to the increasing burden of various skin diseases and conditions, including skin cancer, across the world.

SOLUTION

Body lesion analysis & Monitoring system

- Our innovative solution combines both software and hardware components to provide users with the most accurate diagnosis of their skin spots. By using advanced artificial intelligence to analyze skin images, our system categorizes them based on their type and level of risk.
- we have developed a skin monitoring device that continuously collects data on skin exposure and moisture levels, allowing users to stay on top of any changes that may require medical attention.
- We have incorporated virtual reality technology into our app to enhance the user experience. Users can now explore skin lesions in an interactive and immersive way, allowing them to gain a better understanding of their skin health.




6
Flutter
Flutter framework for building the mobile app
5
PYTHON
Django or Flask for building the backend server for the app
1
FIREBASE
Firebase for storing user data and app analytics
Tech Stack
API
OpenCV
2
APIs
RESTful APIs for communication between the frontend and backend
4
ML
deep learning libraries like TensorFlow, for developing the AI algorithms for lesion analysis.
OPENCV
OpenCV for image processing and feature extraction
3

Architecture

Input Image

↓

Pre-Processing

↓

Deep learning Model

↓

Classification

↓

Output Diagnosis

Workflow

1. User captures an image of the skin lesion using a smartphone camera or other imaging device.
2. The system performs tasks such as image filtering, segmentation, and normalization to enhance the quality of the image.
3. The system extracts features such as color, texture, and shape using various image analysis techniques.
4. The system classifies the skin lesion based on the extracted features and compares it to a database of known lesions to determine the type and level of risk.
5. The system provides a risk assessment that suggests a course of action for the user, such as monitoring, seeking medical attention, or further testing based on the lesion classification.
6. The system collects data on the user's skin lesions and their risk assessment to help track changes and provide feedback over time.
7. The system continuously learns from the data collected to improve its accuracy and effectiveness in lesion classification and risk assessment.

Implementation

1. Choose a programming language, such as Python, for AI development.
2. Set up a deep learning framework, such as TensorFlow, PyTorch, or Keras.
3. Pre-process the images of skin lesions, including resizing, normalizing, and splitting into training, validation, and test sets.
4. Define the model architecture, either by using a pre-trained model and fine-tuning it or training a model from scratch.
5. Train the model using an optimization algorithm to accurately classify skin lesions as benign or malignant.
6. Evaluate the model's performance using metrics such as accuracy, precision, recall, and F1 score.
7. Deploy the model in an AI-powered skin lesion analysis system by integrating it into a web or mobile application or deploying it as a standalone tool.

Future Aspects

- Expand into new markets, both internationally and beyond dermatology.
- Continuously improve and develop AI algorithms to enhance accuracy and recommendations.
- Explore integration with EHRs and telemedicine for more comprehensive and remote care options.
- Form partnerships with healthcare providers to offer value-added services and enhance diagnostic capabilities.

Features

Track and monitor skin changes

DiagnoScan could also include a feature for users to track and monitor changes in their skin over time

Skin lesion analysis

The primary feature of DiagnoScan would be the ability to analyze skin lesions using AI

Education and information

Many people may not be familiar with the different types of skin lesions or how to identify potential warning signs

Connect with dermatologists

In some cases, users may want to connect with a dermatologist for further evaluation or treatment.

Reminders and alerts

DiagnoScan could also include a feature for users to set reminders for regular skin checks or follow-up appointments.

ADDITIONAL FEATURES

Skin Monitoring Device

- Measures skin exposure and moisture levels.
- Provides continuous data collection and alerts users to changes that may require medical attention.
- Allows users to stay on top of their skin health and take proactive measures to maintain it.

Virtual Reality

- Immersive and interactive visualization of skin lesions
- Allows users to better understand their skin health and make informed decisions about their care
- Enhances the overall user experience and engagement with the app
- Provides a unique and innovative approach to skin health monitoring.

TEAM DETAILS

(TEAM MENTOR)

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THANK YOU