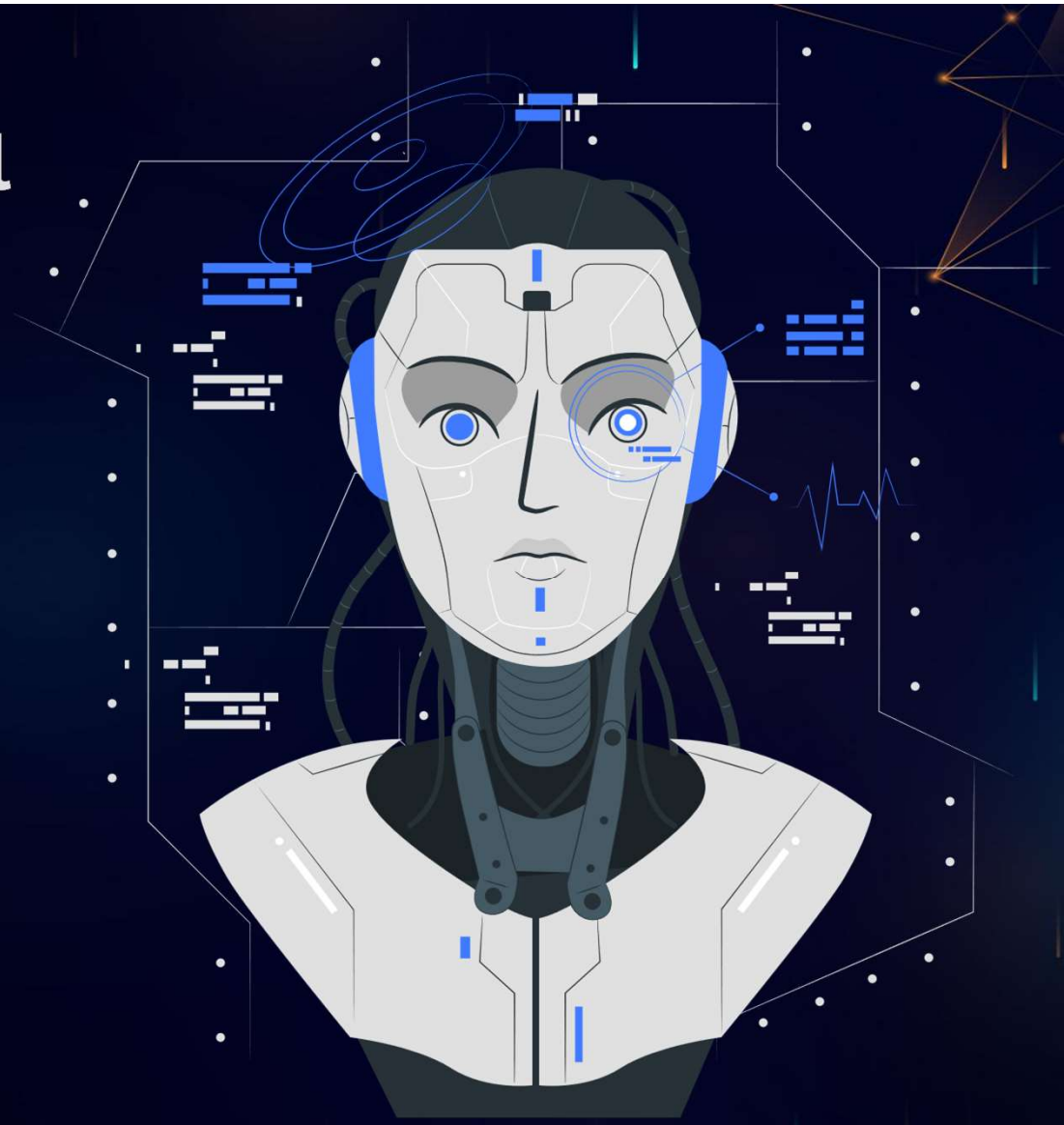
AI-Based Dermatological Disease Diagnosis using oneAPI



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Problem Statement

Approximately 2 billion people worldwide suffer from dermatological disorders, impacting their well-being and social participation. Providing adequate care to under-served regions is challenging due to the lack of diagnostic tools and trained physicians. An AI-based tool for preliminary diagnosis through image processing can greatly enhance healthcare in these areas.

Market Size

According to Knowledge Sourcing Intelligence, the AI in dermatology diagnosis market was valued at US$101.803 million in 2021, indicating a continuously growing market.

Growth Factors:

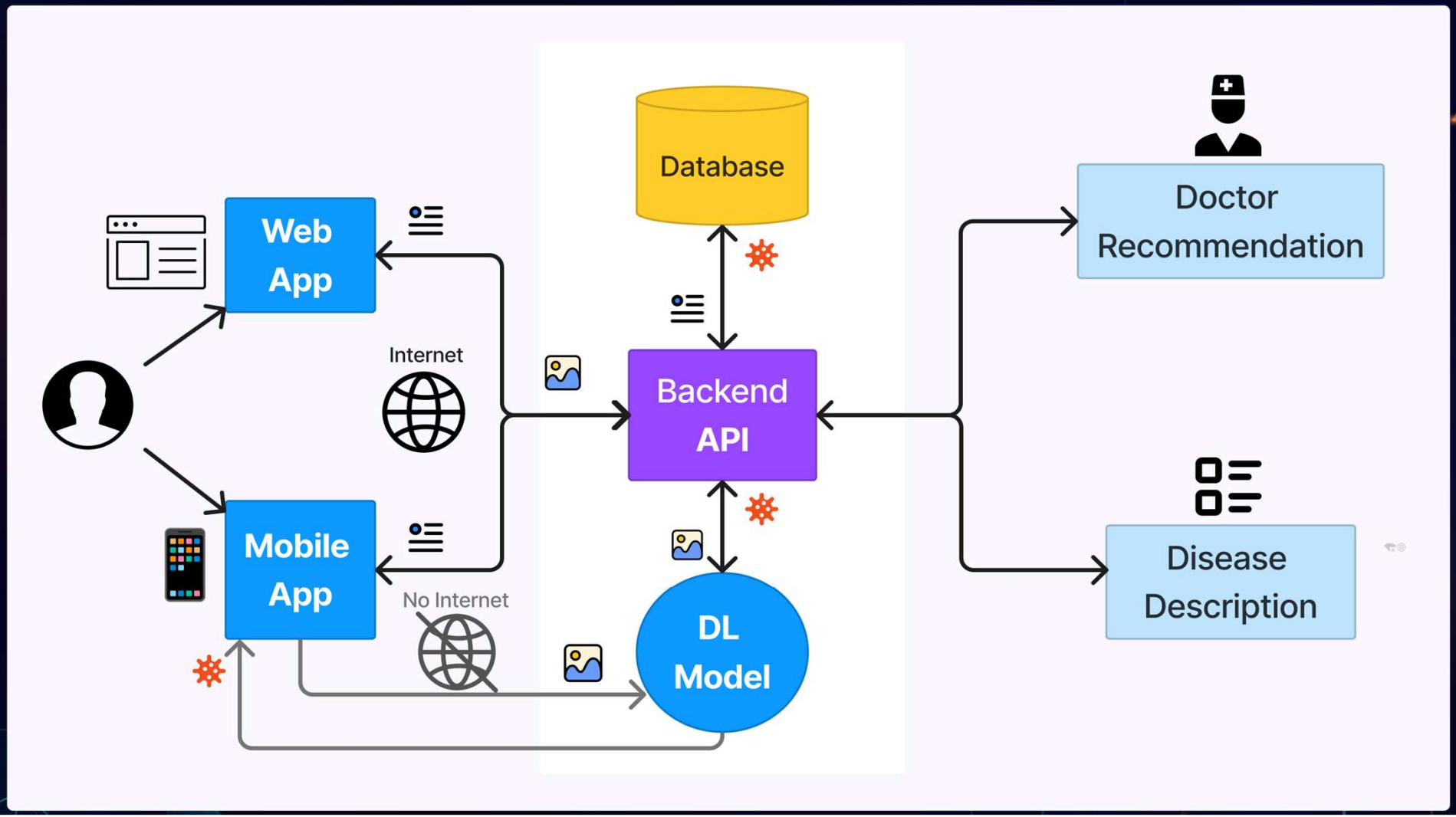
- Increasing demand for accurate and efficient diagnosis
- Rising prevalence of dermatological diseases
- Growing potential of AI in healthcare

Existing Solutions

There are several ongoing research projects and commercially available tools that use artificial intelligence to assist in diagnosing skin diseases. Some notable examples include:

- FYND (Find Your Diagnosis) mobile app developed by Stanford University
- DermAssist tool by Google Health
- HiSkin, a handheld device developed by HiMirror

Project Architecture



Approach

1. Data Collection and Preprocessing: Collect a diverse dataset of dermatological disease images and preprocess the data for proper labeling and noise handling.

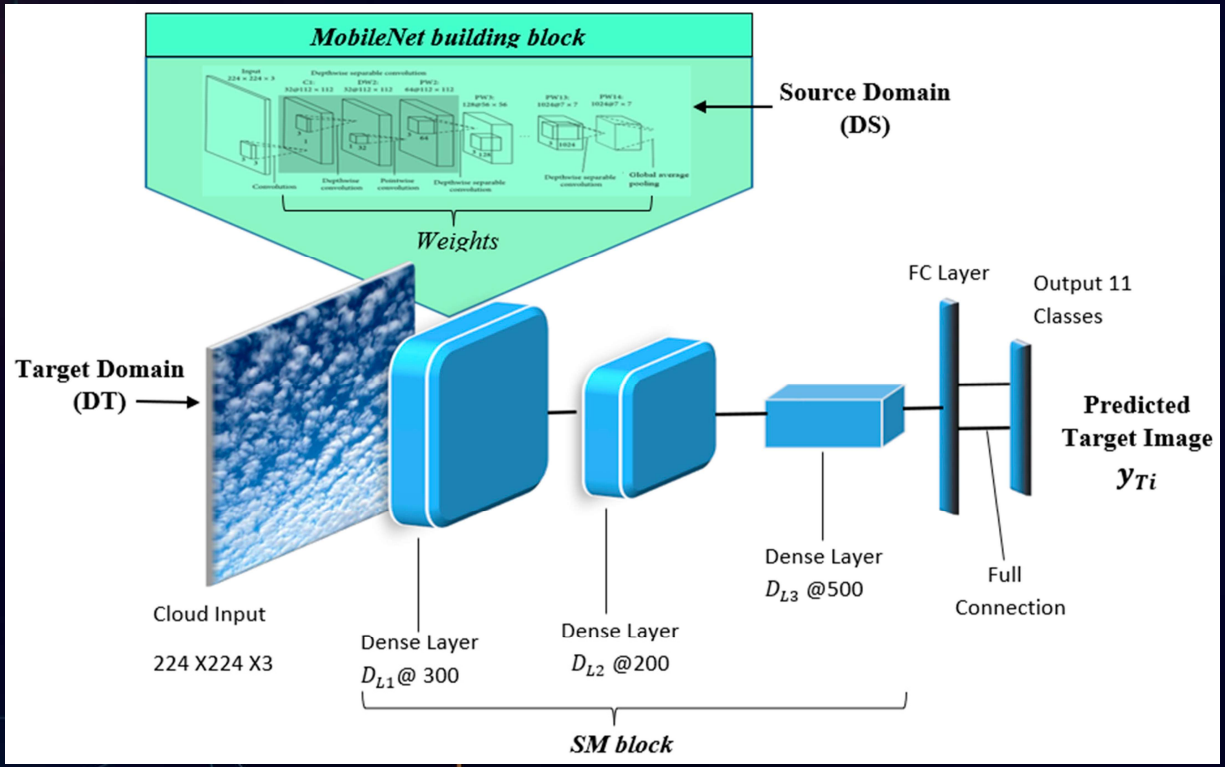
2. AI Model Development : Develop a Headless MobileNet model boosted with Intel OneAPI tooklit for accurate disease prediction.

3. UI Development: Create a mobile application and a web application for the End users to utilize the model.

4. Implementation of Key Features: Key features such as personalized healthcare support, doctor recommendations, consultation booking, etc.

AI Models

Headless Mobile Net



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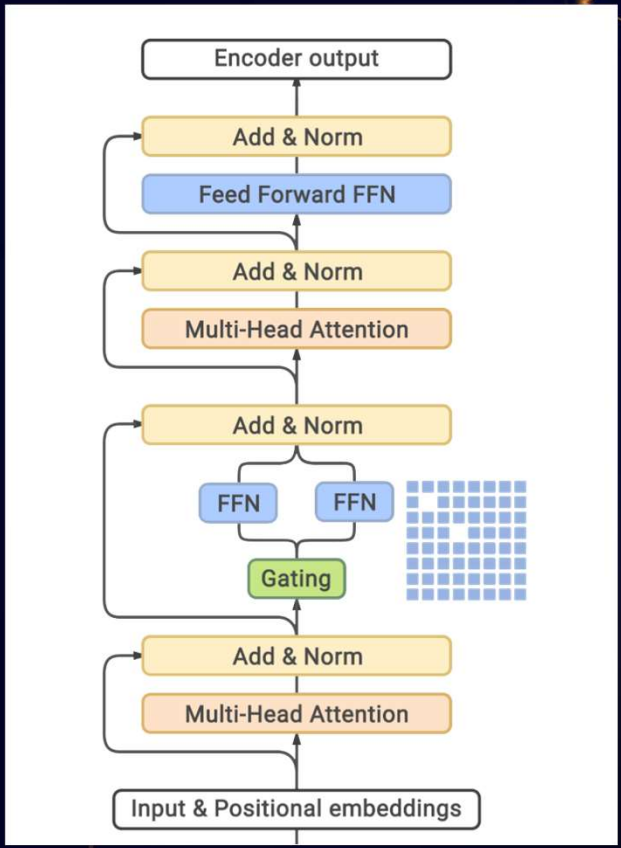

Key Features

- **Optimized Performance with Intel OneAPI:** Utilizes Intel's OneAPI for efficient processing of dermatological data, ensuring optimized performance.
- **Real-Time Results:** Provides instantaneous results and feedback, enabling swift diagnosis and treatment planning.
- **Personalized Healthcare and Wellness:** Offers personalized tips, diet suggestions, and other wellness recommendations based on individual patient data, enhancing disease management and overall well-being.
- **Doctor Recommendation System:** Recommends nearby dermatologists based on lesion conditions, facilitating timely and appropriate medical care.
- **Cross-Platform Accessibility:** Accessible on various devices and platforms, ensuring convenience and usability for users.

Target Audience

- Individuals with Dermatological conditions
- Healthcare providers, such as Hospitals and clinics
- NGOs, Startups and Government agencies like NITI Aayog

Revenue Streams

- Freemium model
- Partnership with NGOs and Government agencies
- Contributing Anonymized Data for Dermatological Advancements

Future Developments

- **Integration of explainable AI (XAI) techniques:** This can help users understand the tool's reasoning behind its predictions, boosting trust and transparency.
- **Consultation booking:** Enable users to schedule virtual dermatology consultations directly through the app, improving access to healthcare services.
- **Incorporating Multi-modal data analysis:** Enhance diagnosis by integrating diverse data sources like demographics, medical history, and patient-reported symptoms for more accurate results and personalized recommendations.
- **Multi-lingual Support:** Enable the app to support multiple languages, ensuring accessibility for users from diverse linguistic backgrounds and regions.


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YOU