

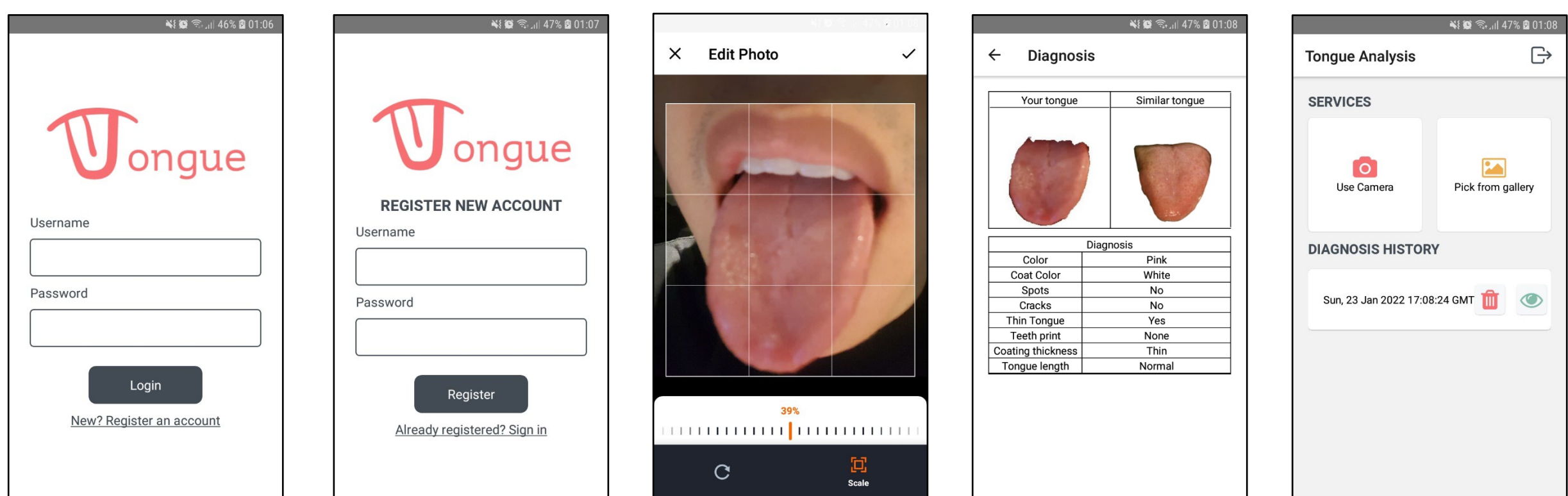
Smartphone-based Tongue Diagnosis system

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Project Objectives:

This project aims to design an automatic tongue diagnosis system to analyze tongue images captured using a smartphone. The proposed system aims to allow users to take a picture of their tongue, perform tongue image analysis and produce a diagnosis report. The system will first segment the tongue from the input image and perform a content-based image retrieval (CBIR) to retrieve the most similar tongue image along with its diagnosis from an image database. Additionally, users will be able to register an account, log in and view their diagnosis history.

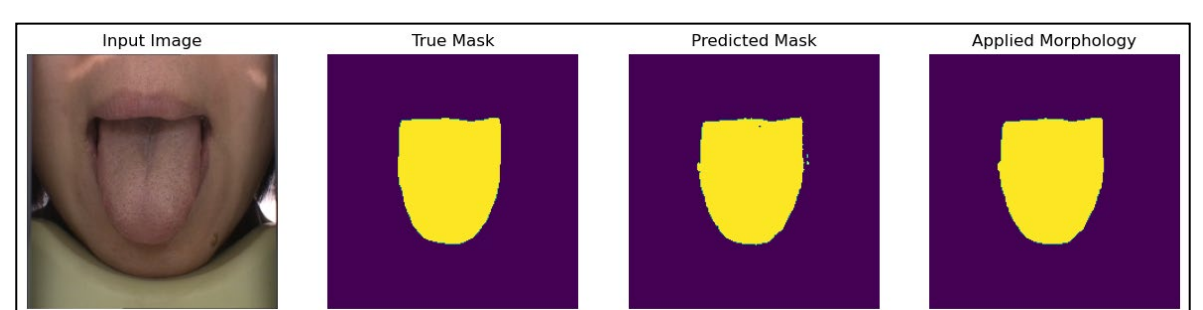


Approach:

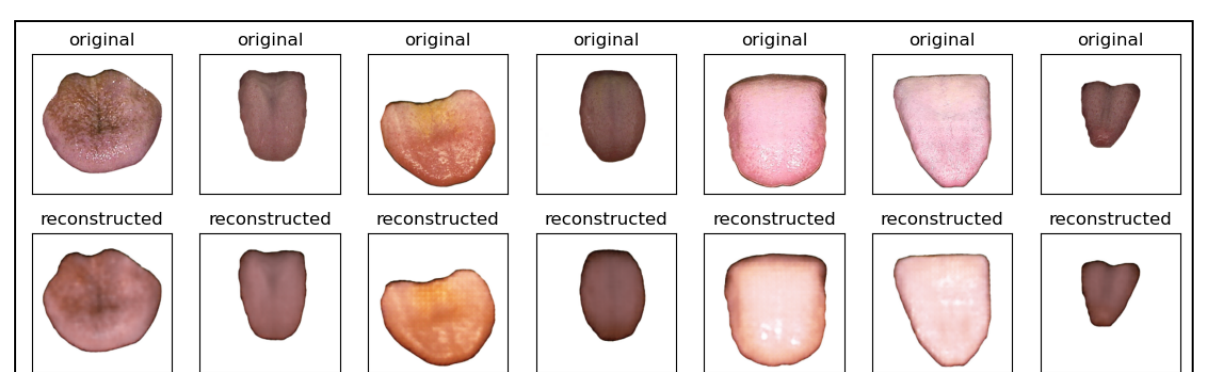
The project was implemented using React Native as the frontend, Flask as the backend server, and SQLite3 as the database.

The final implementation of the system uses:

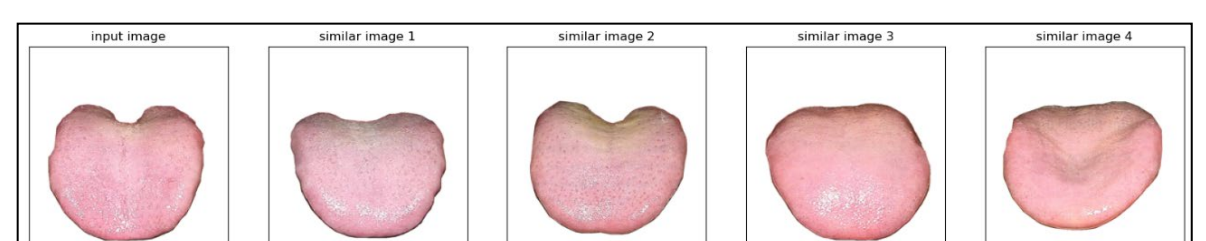
- U-Net and morphological operations to segment the tongue image
- An encoder (generated from training a convolutional autoencoder) to extract the feature vector of the tongue image
- Annoy index (Approximate nearest neighbour algorithm) to query the most similar tongue image with the tongue's feature vector as input.



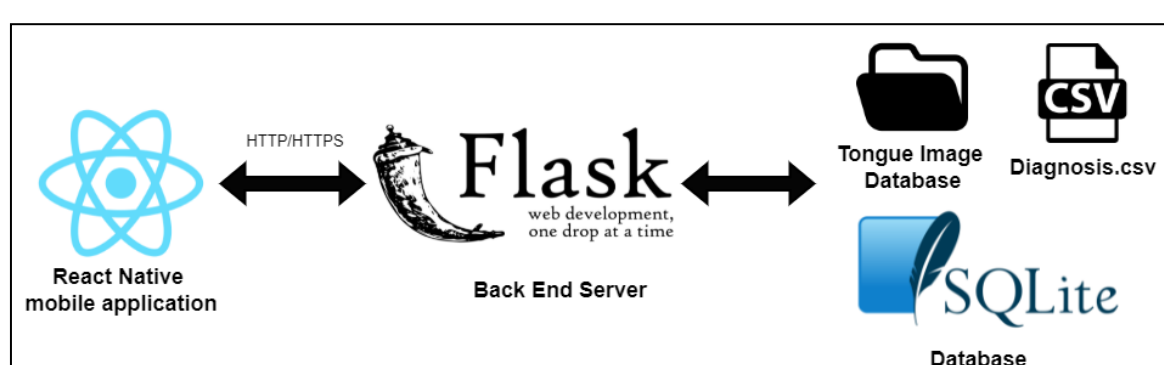
U-Net + Morphological operations
(Image Segmentation)



Autoencoder



Query using Annoy Index



System Architecture