Covid_19 detection BY Lung X-Ray Using Azure Custom Vision from Azure Cognitive Services

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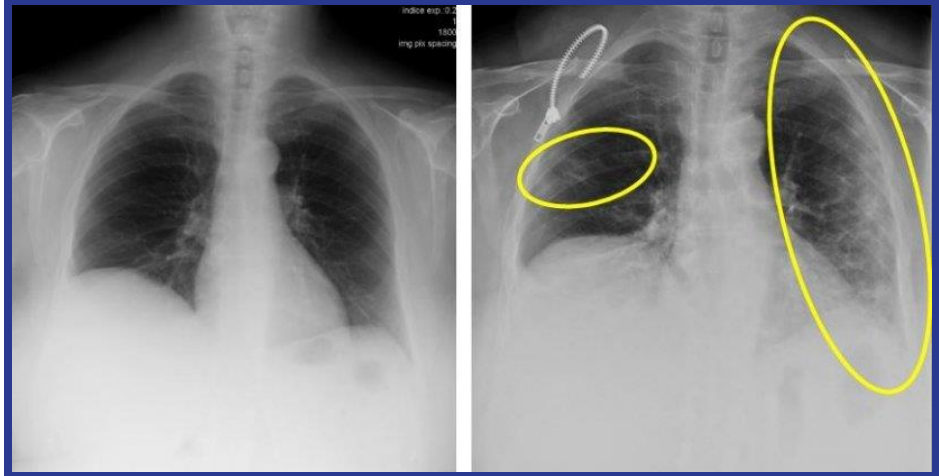
Content

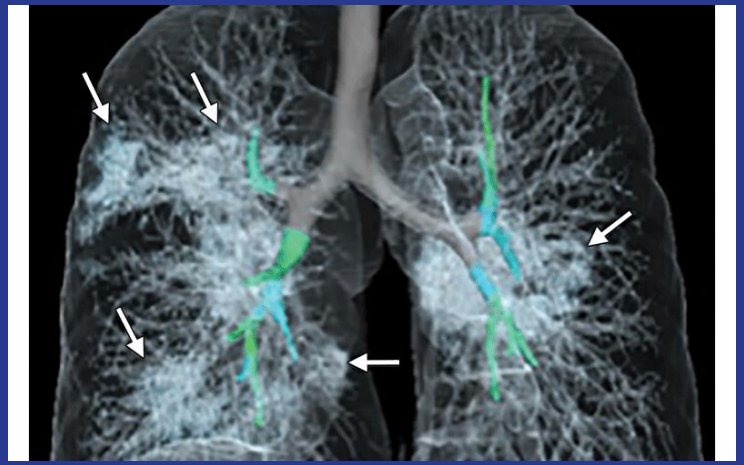
Abstract

How radiology help us detecting Covid_19 from Xrays?

Radiology is fundamental in this process. The radiologist's main contribution is to facilitate and expedite as much as possible the exploration, help design specific circuits and provide a fast and accurate report of the radiological findings that should indicate whether or not these are consistent with the COVID-19 coronavirus infection



What are the typical radiological findings?



The findings that make us strongly suspect that we are dealing with a COVID-19 infection are the ground glass patterned areas, which, even in the initial stages, affect both lungs, in particular the lower lobes, and especially the posterior segments, with a fundamentally peripheral and subpleural distribution. These findings are present on chest CT in practically 50% of patients in the first two days; For this, in China, CT is being used as a screening or diagnostic method

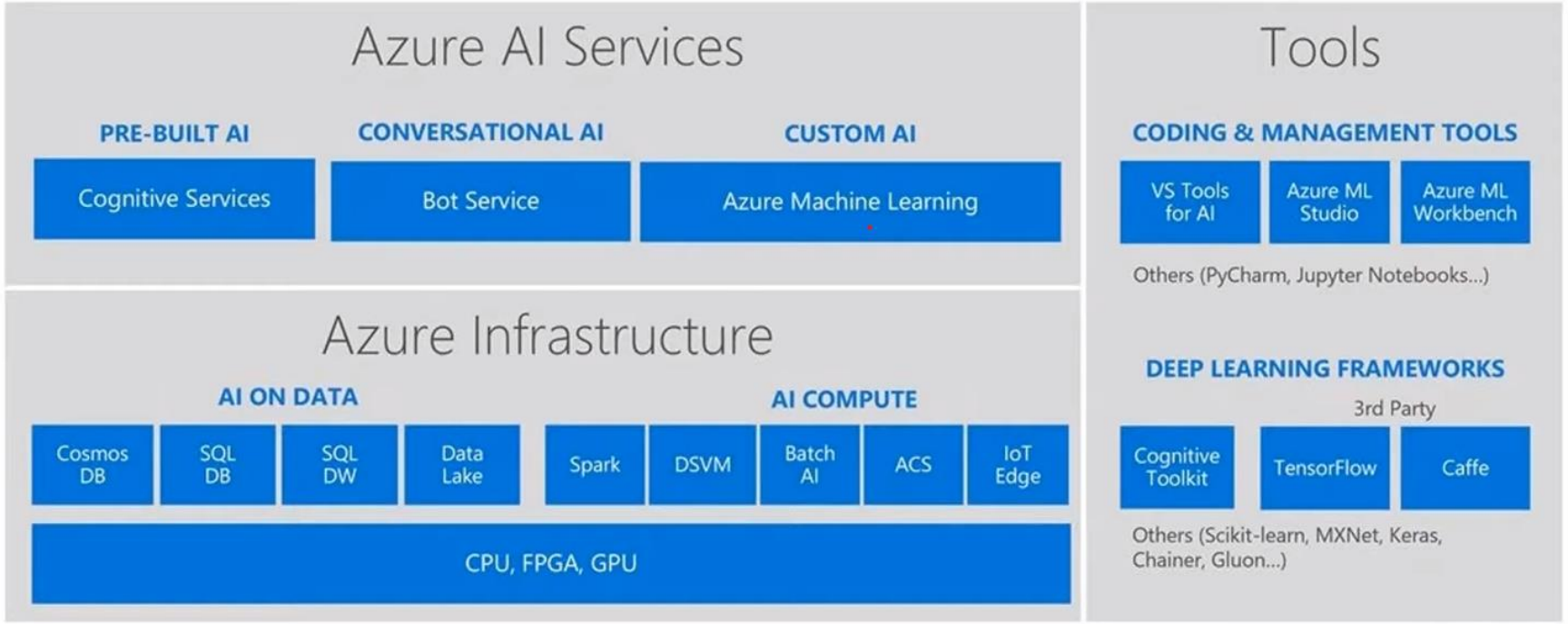
Goals & Objectives

- Detection of Covid-19 Disease using proper Biomarkers
- Making a model with trained data to classify the the person if he is suffering from Covid-19 or not?
- Make use of dataset that consist covid_19 Xray of Lungs and build a classification model that can be used in

Proposed system

- First we collect all the Data and then build a Using Azure Custom Vision
- We Export the model using tensorflow.lite model and use it Android Phone and make a application for Covid Detection
- The Application Will take the information of patient And Store it in Azure Sql database for analysis
- The application will take image of Xray and tell us if it is Covid_19 or not using model build in Azure Custom Vision

Microsoft AI Platform



Azure Cognitive Services

Perception

Vision

Computer Vision
Face/Emotion Recognition
OCR/Handwriting
Custom Vision
Video Indexer
Content Moderator

Speech

Text-to-Speech
Speech-to-Text
Translator
Custom Speech

Comprehension

Language

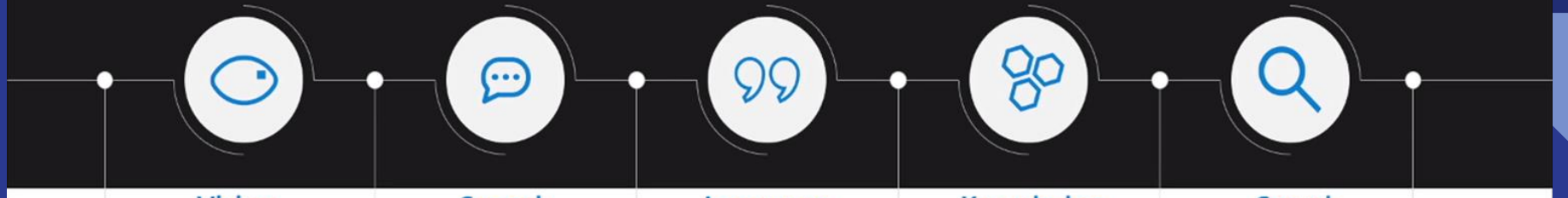
Language Understanding
PII Detection
Text Translator
Text Analytics
QnA Maker

Knowledge

Bing Custom Search
Bing Visual Search

Cognitive Services capabilities

Infuse your apps, websites, and bots with human-like intelligence



Vision

- Image Tagging, Thumbnails
- OCR, Handwriting recognition
- Customized image recognition
- Face detection
- Emotion recognition
- Video insights
- Image and video moderation

Speech

- Speech to text (Speech Transcription)
- Customized speech Transcription (complex word, noisy environment)
- Text to speech
- Speaker ID and authentication
- Real-time speech translation

Language

- Contextual language understanding – customized intent analysis
- Sentiment analysis, key phrase detection
- text translation up to 60+ languages
- Text Moderation
- Spell checking

Knowledge

- Q&A service and bot training
- Reinforcement learning for personalized content delivery

Search

- Automatic search suggestions
- Comprehensive news, image, and video results
- Entity information augmentation
- Tailored and customized search experiences

Custom Vision

A customizable web service that learns to recognize specific content in imagery

Upload images

Upload your own labeled images, or use Custom Vision Service to quickly tag any unlabeled images

Train

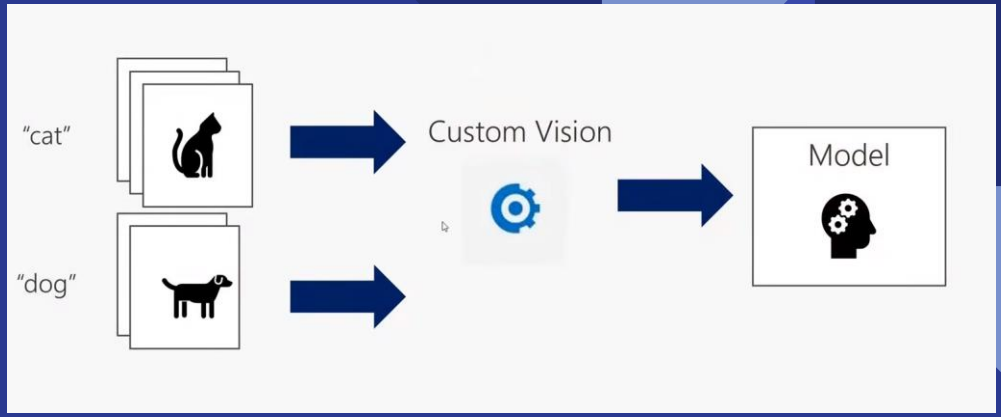
Use your labeled images to teach Custom Vision Service the concepts you want it to learn

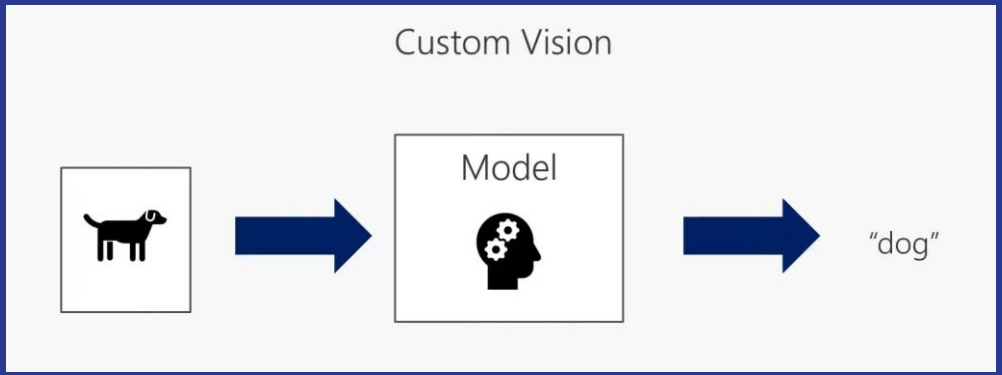
Evaluate

Use simple REST API calls to quickly tag images with your new custom computer vision model

Active learning

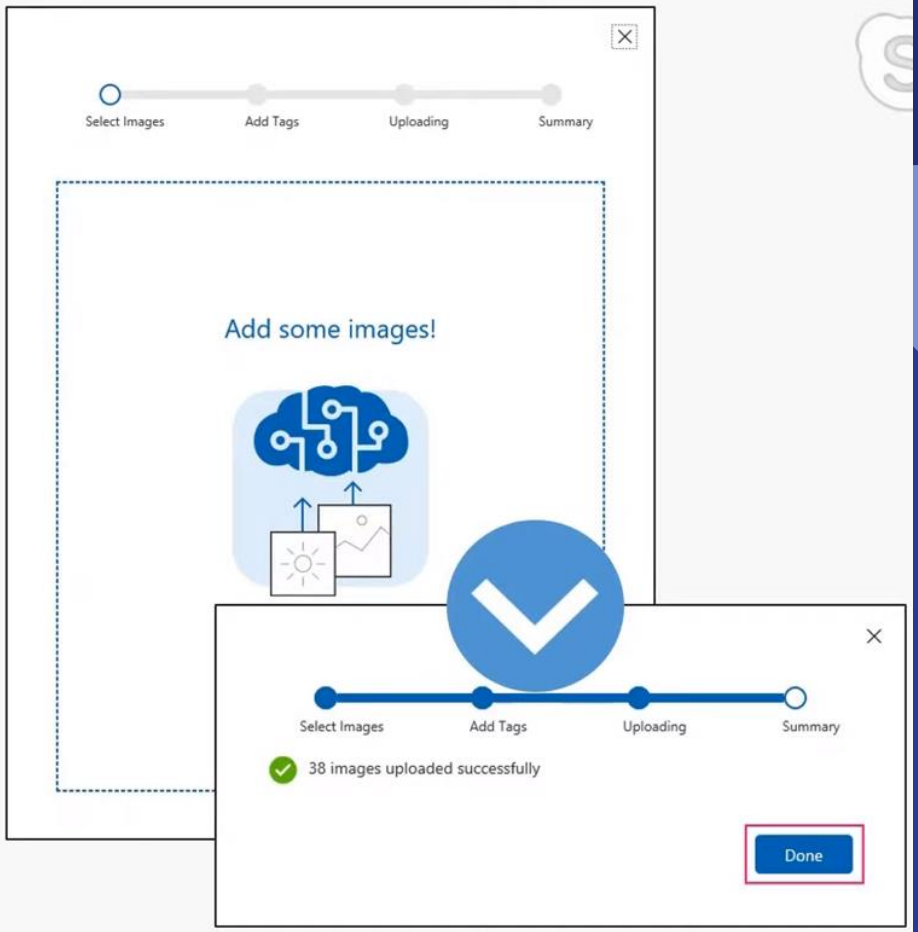
Images evaluated through your custom vision model become part of a feedback loop you can use to keep improving your classifier





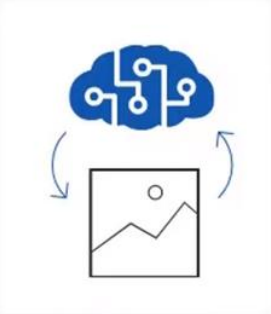
Building a Classifier

- Create a project
- Select a domain
- Add images
- Assign tags to images
- Train the classifier
- Evaluate the classifier



Train in the cloud, run anywhere

Train in Custom Vision Service



Deploy & Run Anywhere

ONNX/
WinML

TensorFlow

CoreML

Azure
IoT Edge

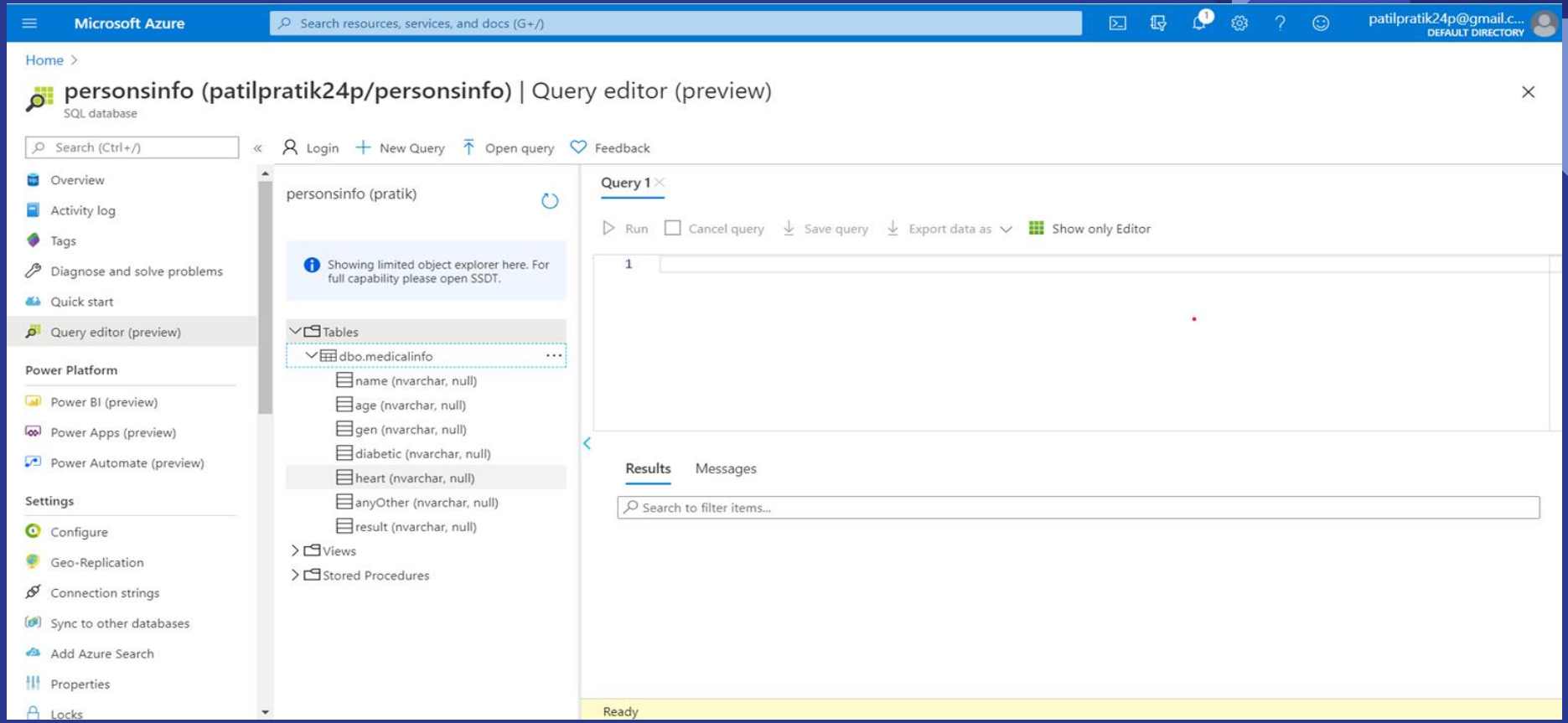
Why Choose Azure Custom Vision To Build Machine Learning?

- Build Model without having any Knowledge of Machine Learning and Deep Learning And Integrate machine Learning in Your Application
- Easy to use service with performance scores and saving Your training information
- No Hardware like Gpu required As Azure custom Vision trains model on its infrastructure and cloud
- The endpoint i.e the model can be used as an API saved on Azure Cloud on container or export models in tensorflow,tflite,CoreML...etc
- The model can easily integrated in your Application and it will be hosted on Azure Cloud which will take care of scalability

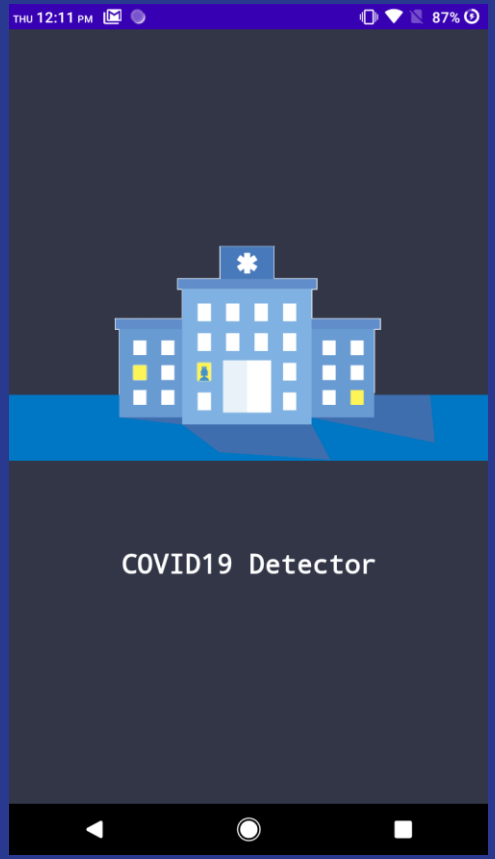
Use Of Azure Sql Database

- We have used Azure Sql database to store patient Information like Name,Age,Gender,Medical condition like heart disease and Diabetes
- This Will Help us in Analysis and alert the patient if he has Covid and has any medical condition that can be fatal
- Azure Sql is easy to integrate in Application using different connection strings,We have used JDBC

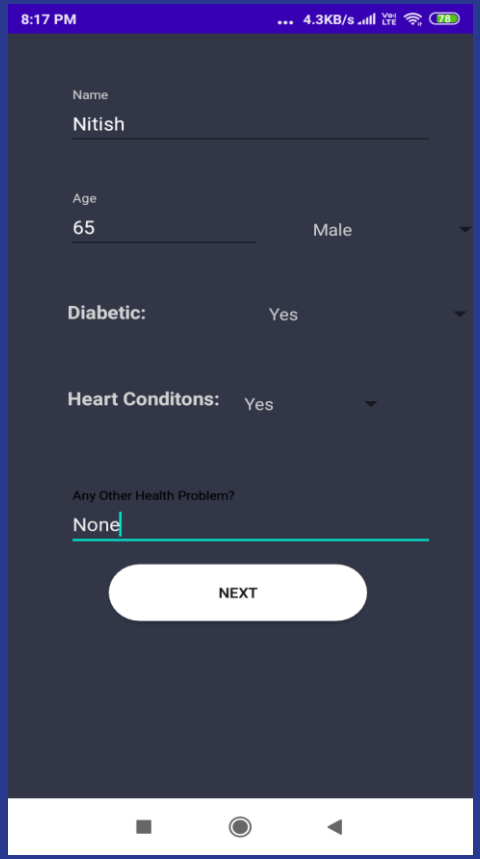
Azure SQL Database



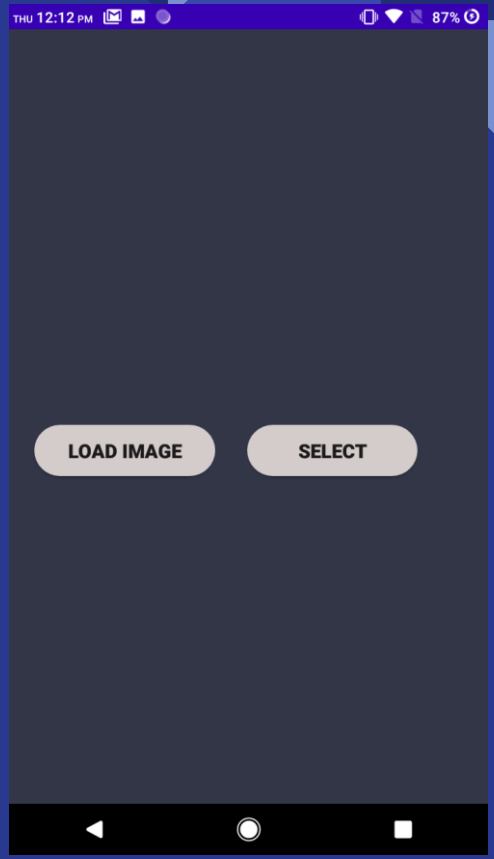
Introduction



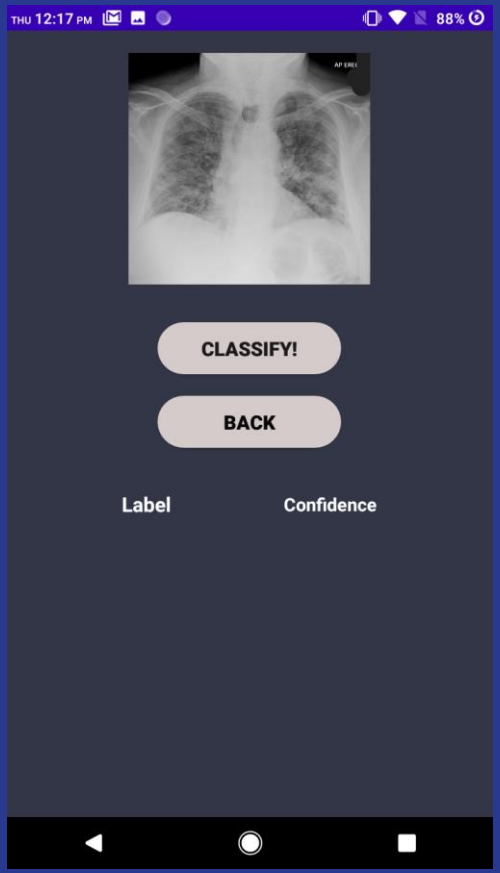
Patient Info



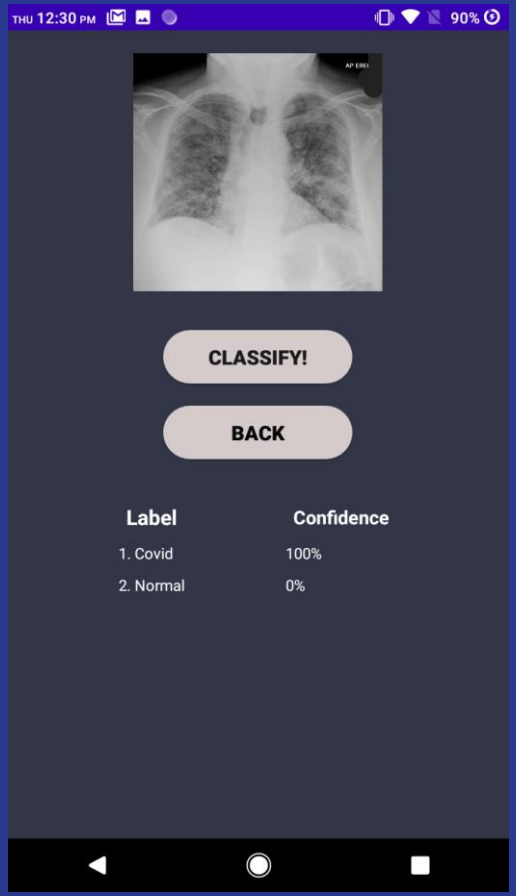
Load Image and Select image from gallery



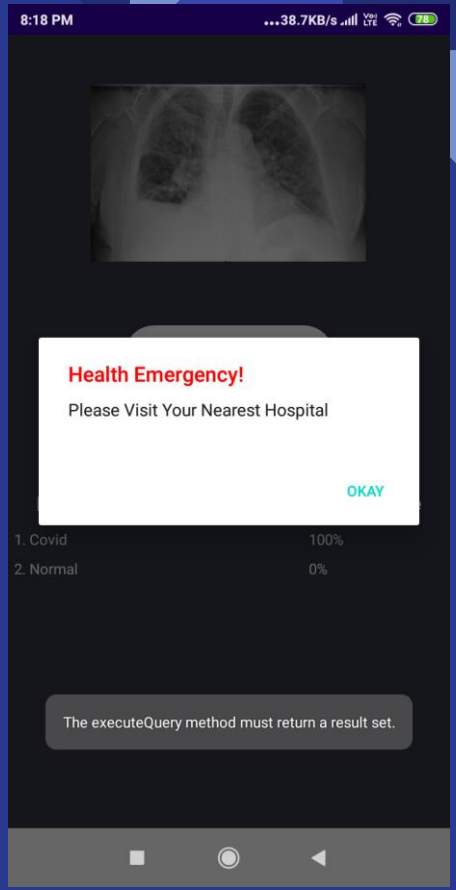
Click on Classify Button



Check The Result

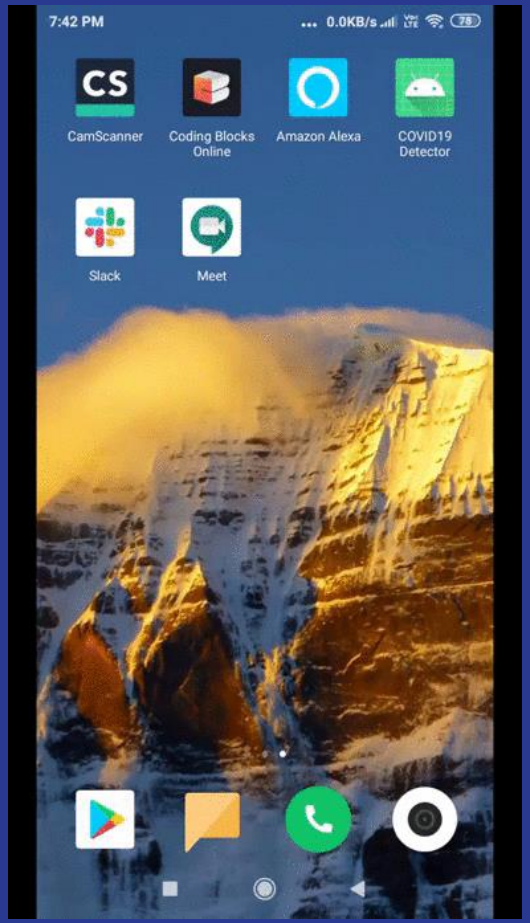


Alert if Patient in Danger



Prototype

Covid Prediction



Normal Prediction

System Architecture