

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

By :

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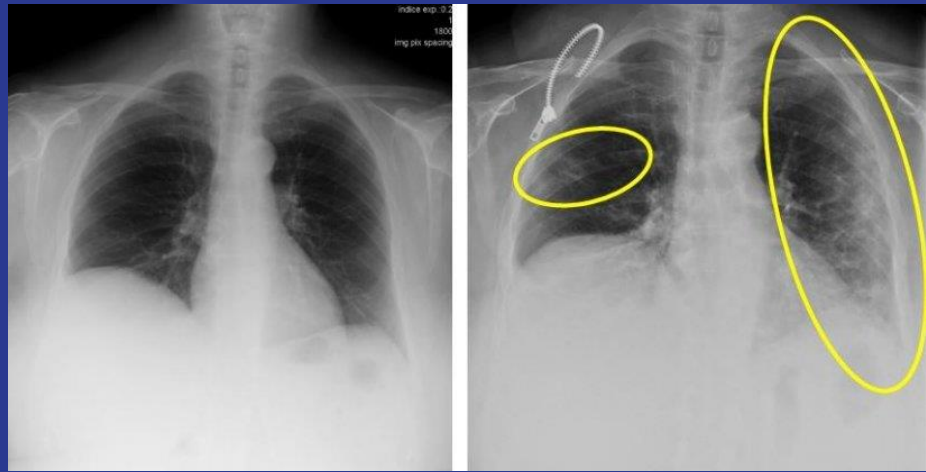
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- 3) Proposed System
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- 7) System Architecture

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

Android/iOS

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 AI Services

PRE-BUILT AI

Cognitive Services

CONVERSATIONAL AI

Bot Service

CUSTOM AI

Azure Machine Learning

Azure Infrastructure

AI ON DATA

Cosmos DB

SQL DB

SQL DW

Data Lake

AI COMPUTE

Spark

DSVM

Batch AI

ACS

IoT Edge

CPU, FPGA, GPU

Tools

CODING & MANAGEMENT TOOLS

VS Tools for AI

Azure ML Studio

Azure ML Workbench

Others (PyCharm, Jupyter Notebooks...)

DEEP LEARNING FRAMEWORKS

3rd Party

Cognitive Toolkit

TensorFlow

Caffe

Others (Scikit-learn, MXNet, Keras, Chainer, Gluon...)

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

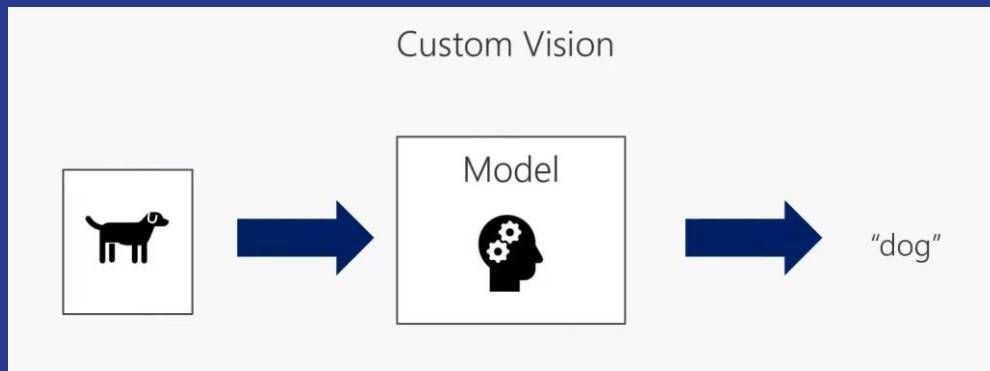
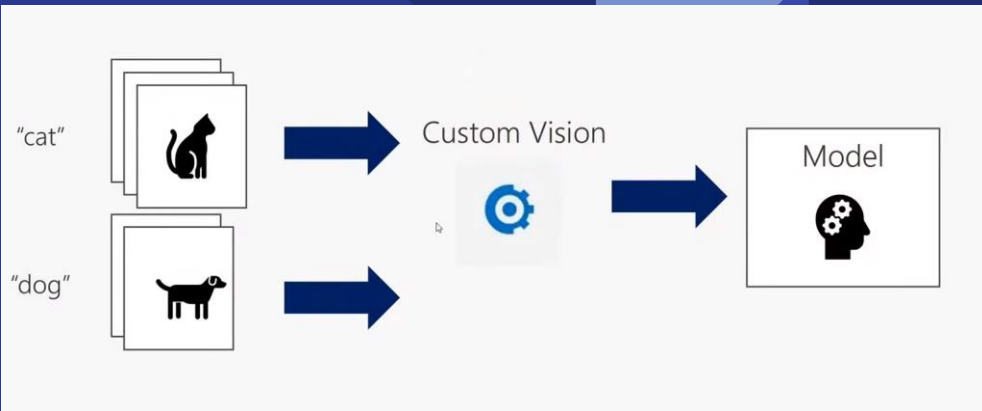
Use your labeled images to teach Custom Vision Service the concepts you want it to learn

Evaluate

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

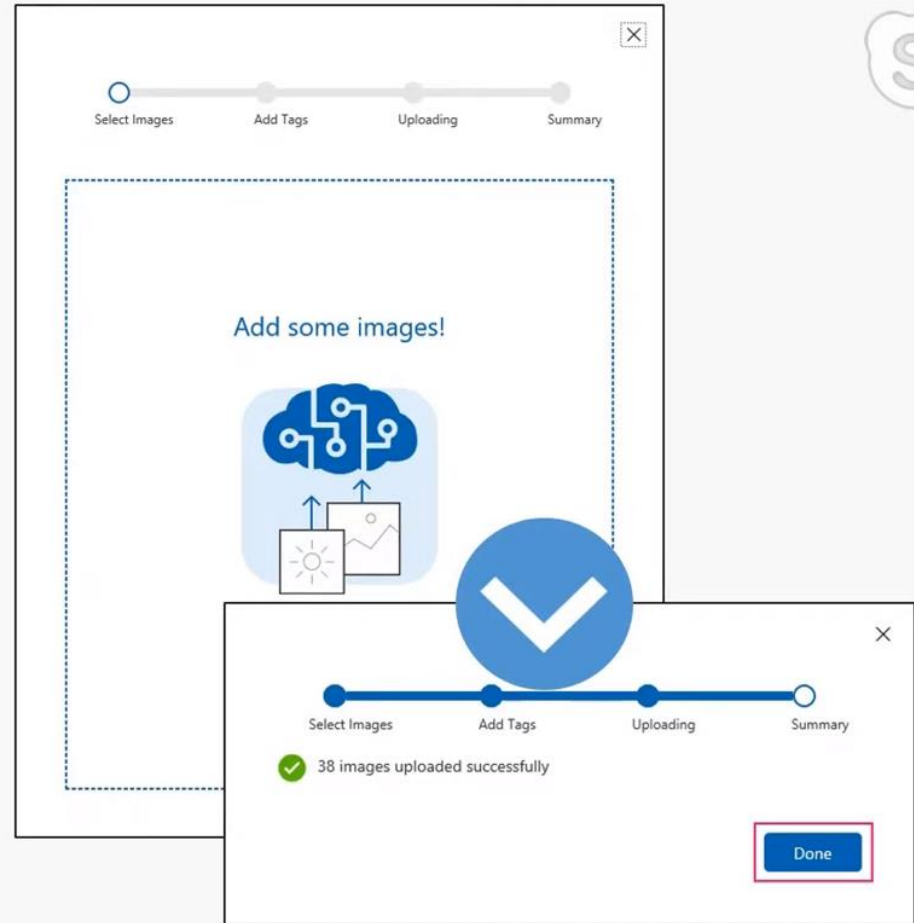
Active learning

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



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

The screenshot displays the Azure SQL Database Query editor interface. At the top, the Microsoft Azure logo and a search bar are visible. The user's profile, 'patilpratik24p@gmail.c...', is shown in the top right corner. The main header indicates the current database is 'personsinfo (patilpratik24p/personsinfo)' and the view is the 'Query editor (preview)'. A left-hand navigation pane lists various tools: Overview, Activity log, Tags, Diagnose and solve problems, Quick start, Query editor (preview), Power Platform (Power BI, Power Apps, Power Automate), and Settings (Configure, Geo-Replication, Connection strings, Sync to other databases, Add Azure Search, Properties, Locks). The central pane shows the 'personsinfo (pratik)' database with a limited object explorer. A message states: 'Showing limited object explorer here. For full capability please open SSDT.' The object explorer lists 'Tables' under 'dbo.medicalinfo', including 'name (nvarchar, null)', 'age (nvarchar, null)', 'gen (nvarchar, null)', 'diabetic (nvarchar, null)', 'heart (nvarchar, null)', 'anyOther (nvarchar, null)', and 'result (nvarchar, null)'. Below the tables are 'Views' and 'Stored Procedures'. The right-hand pane is titled 'Query 1' and contains a 'Run' button, 'Cancel query', 'Save query', 'Export data as', and 'Show only Editor'. The query editor area is currently empty. Below the editor, there are tabs for 'Results' and 'Messages', and a search bar for filtering items. The status bar at the bottom indicates 'Ready'.

Microsoft Azure

Search resources, services, and docs (G+/)

Home >

personsinfo (patilpratik24p/personsinfo) | Query editor (preview)

SQL database

Search (Ctrl+/)

Login + New Query ↑ Open query Feedback

Overview

Activity log

Tags

Diagnose and solve problems

Quick start

Query editor (preview)

Power Platform

Power BI (preview)

Power Apps (preview)

Power Automate (preview)

Settings

Configure

Geo-Replication

Connection strings

Sync to other databases

Add Azure Search

Properties

Locks

personsinfo (pratik)

Showing limited object explorer here. For full capability please open SSDT.

Tables

dbo.medicalinfo

name (nvarchar, null)

age (nvarchar, null)

gen (nvarchar, null)

diabetic (nvarchar, null)

heart (nvarchar, null)

anyOther (nvarchar, null)

result (nvarchar, null)

Views

Stored Procedures

Query 1

Run Cancel query Save query Export data as Show only Editor

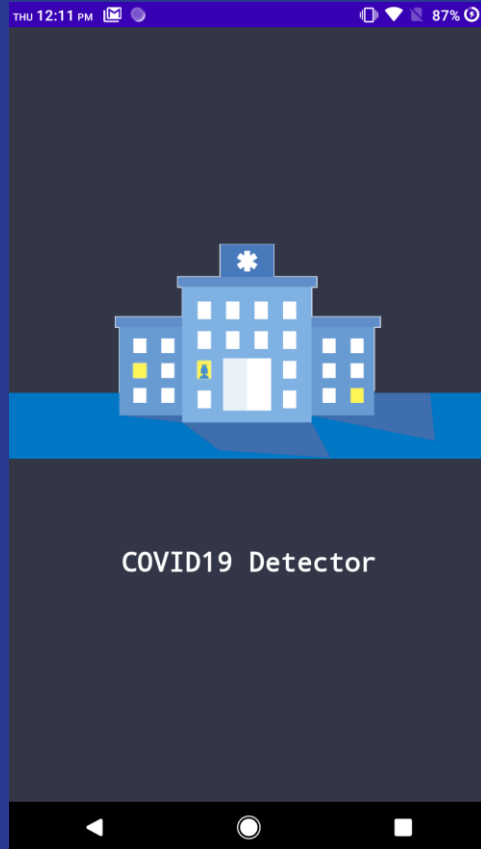
1

Results Messages

Search to filter items...

Ready

Introduction



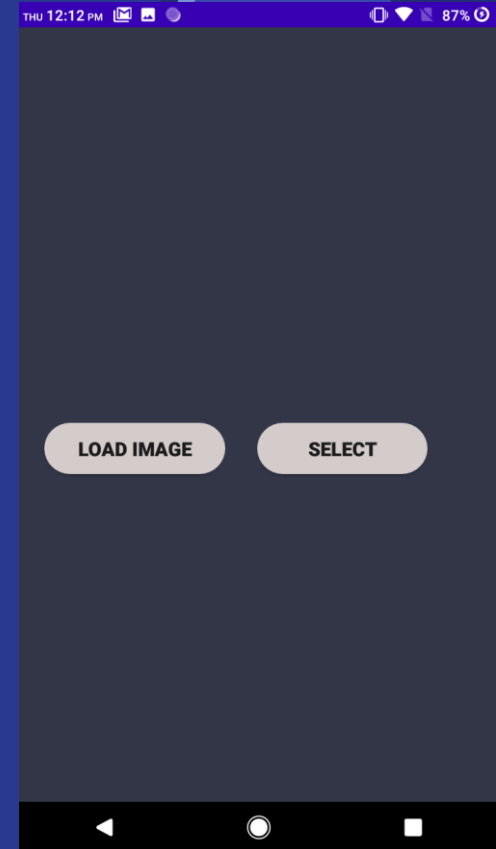
Patient Info

The patient information screen has a dark blue background. The status bar at the top shows 8:17 PM, 4.3KB/s data speed, LTE signal, and 78% battery. The form contains the following fields and options:

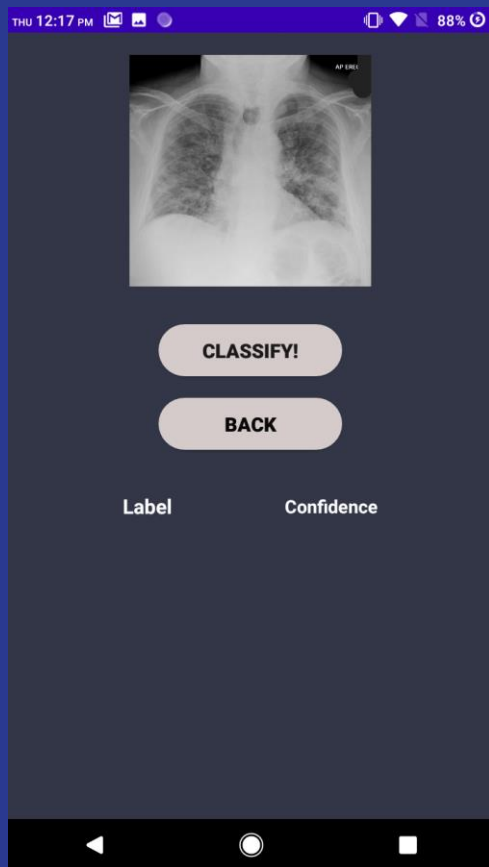
- Name:** A text input field containing "Nitish".
- Age:** A text input field containing "65".
- Gender:** A dropdown menu with "Male" selected.
- Diabetic:** A dropdown menu with "Yes" selected.
- Heart Conditions:** A dropdown menu with "Yes" selected.
- Any Other Health Problem?:** A text input field containing "None".

A white "NEXT" button is located at the bottom center of the form. The bottom navigation bar is black with three white icons: a square, a home circle, and a back arrow.

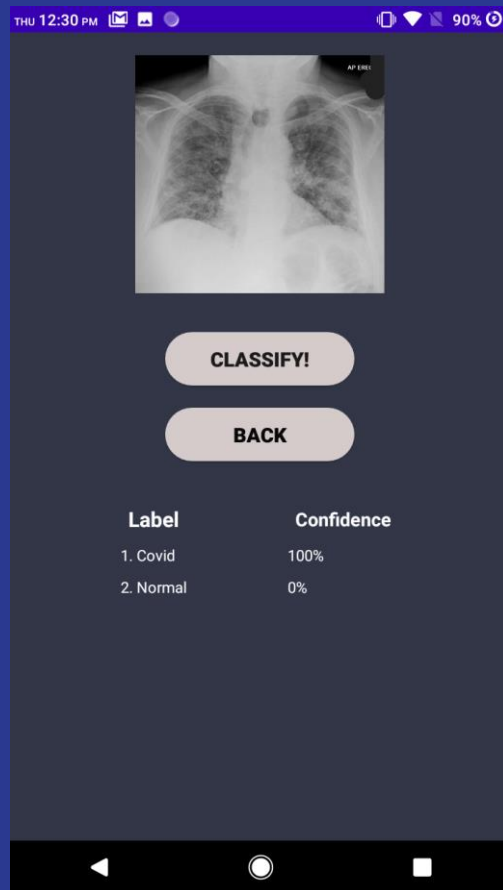
Load Image and Select image from gallery



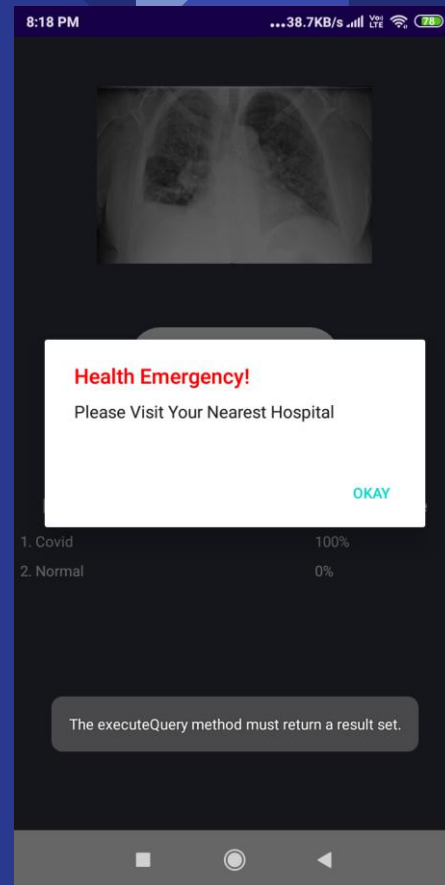
Click on Classify Button



Check The Result

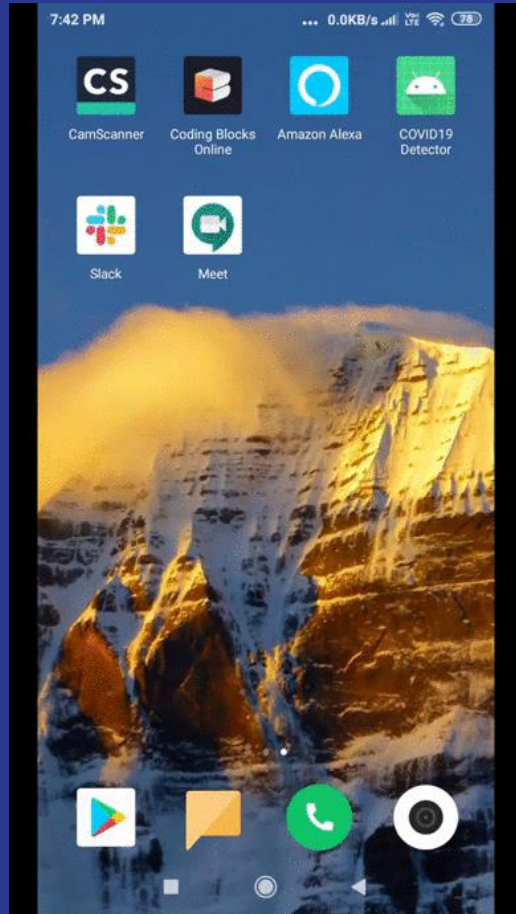


Alert if Patient in Danger

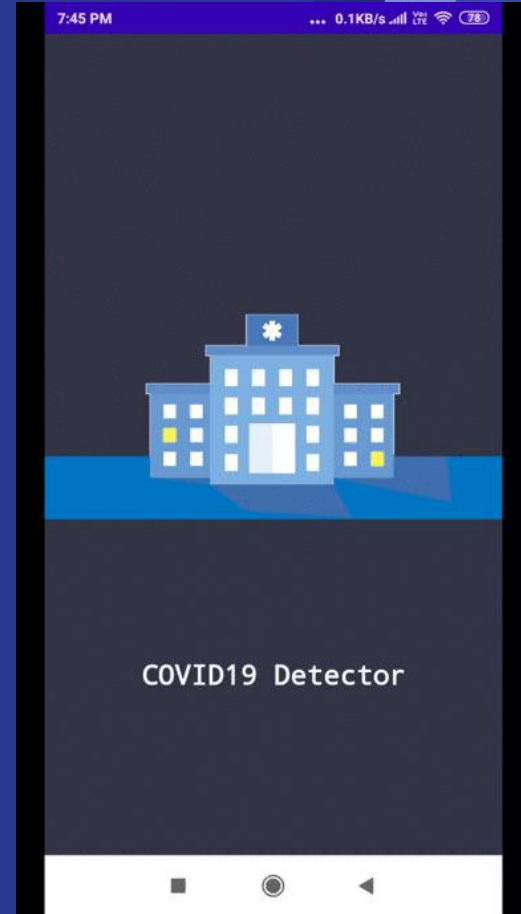


Prototype

Covid Prediction



Normal Prediction



System Architecture

