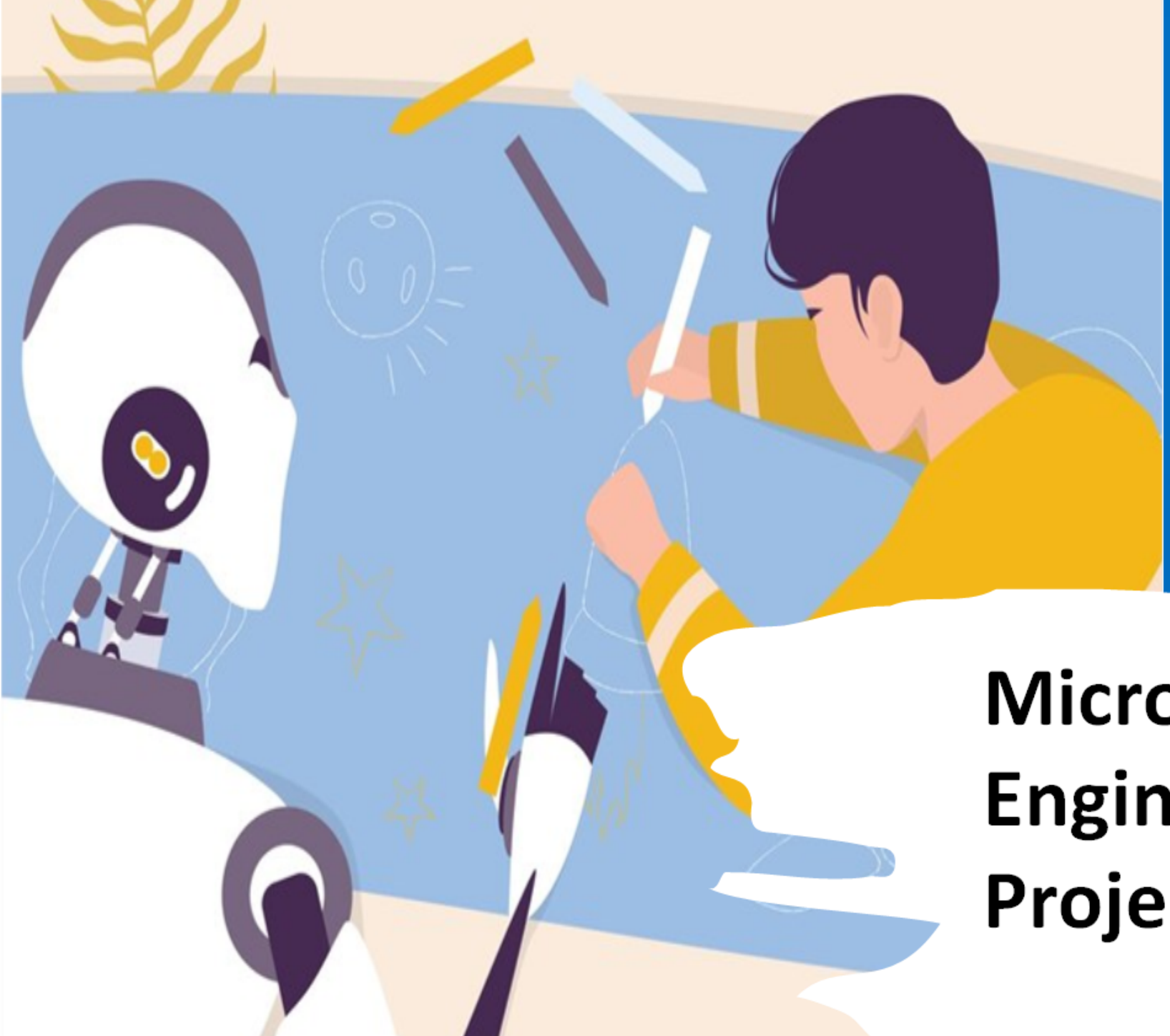

Microsoft Azure AI Engineer Associate Project

Brain Tumor Detection and Classification

(Custom Vision)

Team Members:

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What is Microsoft Azure?

1

Microsoft Azure is a cloud computing platform offered by Microsoft. It provides a wide range of services and tools for building, deploying, and managing applications and services on the cloud.

2

Azure include scalability, security, reliability, and cost-effectiveness. With Azure, businesses can quickly scale up or down their resources based on demand, without having to invest in additional hardware. It also provides a range of security features to protect data and applications and ensures high availability through redundancy and failover mechanisms.

Cognitive Services : Custom Vision

1

Cloud-based machine learning service that enables developers to build, train, and deploy custom image classifiers.

2

Developers can easily create custom models for a wide range of applications, such as object detection, facial recognition, and image classification.

3

Once the model is trained, it can be deployed as an API that can be integrated into applications and services, allowing them to recognize and classify images

Novelty

Improved Accuracy

The system introduces novel algorithms or architectures that enhance the accuracy of object detection.

Customization for Specific Tasks

Custom Vision allows users to train models with their own datasets, making it adaptable to specific requirements. This customization capability is crucial in the medical field, as brain tumor characteristics can vary significantly. The ability to fine-tune models using Custom Vision enables more accurate and personalized detection and classification.

Automation of Diagnosis

Traditional methods of brain tumor detection and classification often rely on manual analysis by medical professionals, which can be time-consuming and subjective. By leveraging Custom Vision, the process can be automated, reducing the burden on healthcare providers and potentially improving efficiency and accuracy.

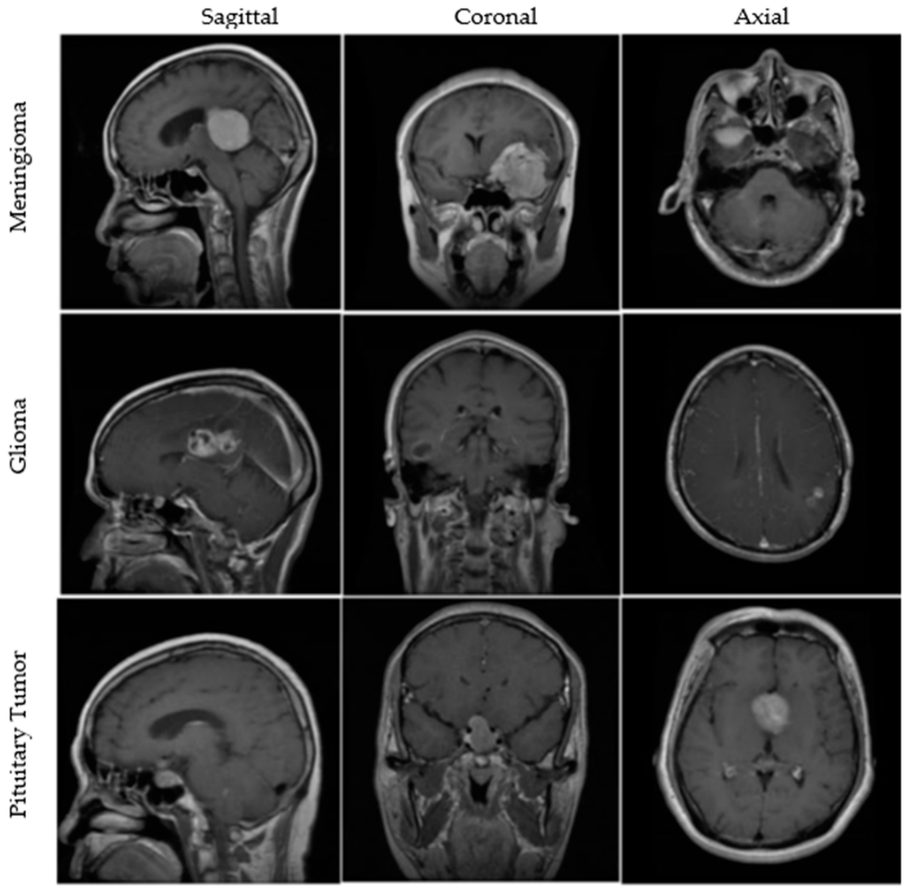
SCALABILITY OF THE PROJECT

Custom Vision's cloud-based nature ensures **accessibility** to medical professionals and researchers worldwide. Additionally, it offers **scalability**, enabling the analysis of large volumes of brain imaging data efficiently. This scalability is especially beneficial in handling the increasing amounts of medical data generated by advanced imaging technologies.

Overview

Detection

- Tumor
- No Tumor



Classification

- Meningioma Tumor
- Glioma Tumor
- Pituitary Tumor

DEMONSTRATION OF THE WORKING PROJECT

Detection

Quick Test Regions Shown

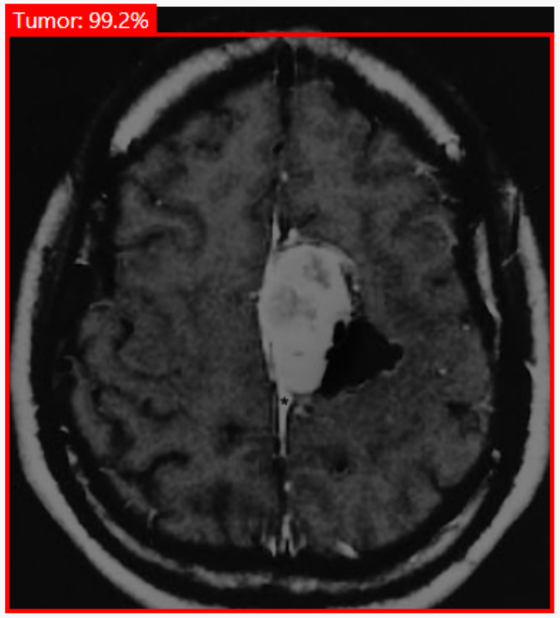


Image URL

Enter Image URL

or

Browse local files

File formats accepted: jpg, png, bmp
File size should not exceed: 4mb

Using model trained in

Iteration

Iteration 1

Predicted Object Threshold

Only show suggested objects if the probability is above the selected threshold.

Threshold Value: 65%

Predictions

Predictions are shown in red

Tag	Probability
Tumor	99.2%

Detection

Quick Test Regions Shown

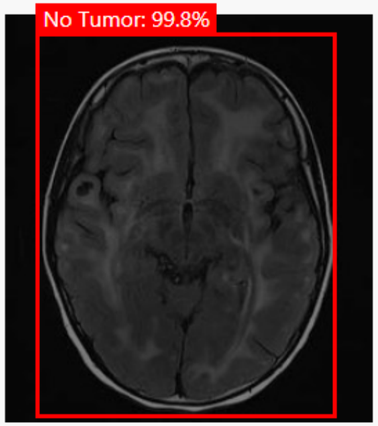


Image URL

Enter Image URL

or

Browse local files

File formats accepted: jpg, png, bmp
File size should not exceed: 4mb

Using model trained in

Iteration

Iteration 1

Predicted Object Threshold

Only show suggested objects if the probability is above the selected threshold.

Threshold Value: 65%

Predictions

Predictions are shown in red

Tag	Probability
No Tumor	99.8%

Classification

Quick Test

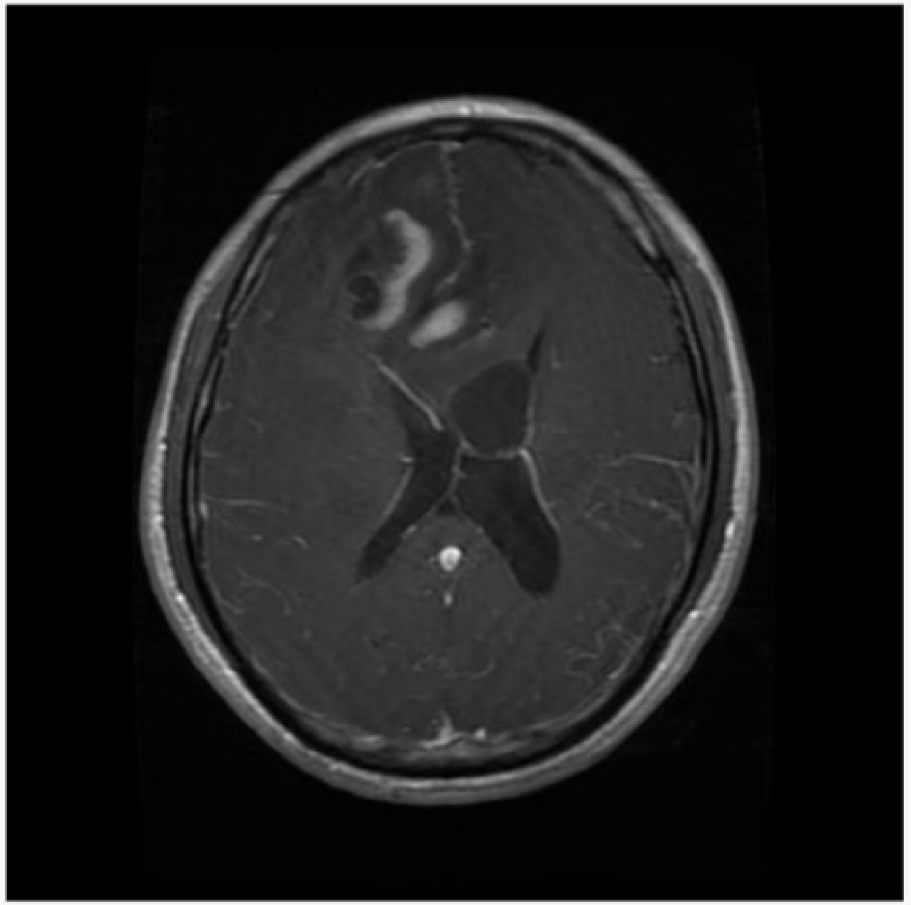


Image URL

Enter Image URL

or

Browse local files

File formats accepted: jpg, png, bmp
File size should not exceed: 4mb

Using model trained in

Iteration

Iteration 1

Predictions

Tag	Probability
Glioma tumor	99.9%
pituitary tumor	0%
Meningioma Tumor	0%

Classification

Quick Test

Image URL

Enter Image URL

or

Browse local files

File formats accepted: jpg, png, bmp
File size should not exceed: 4mb

Using model trained in

Iteration

Iteration 1

Predictions

Tag	Probability
Meningioma Tumor	99.9%
pituitary tumor	0%
Glioma tumor	0%

Classification

Quick Test

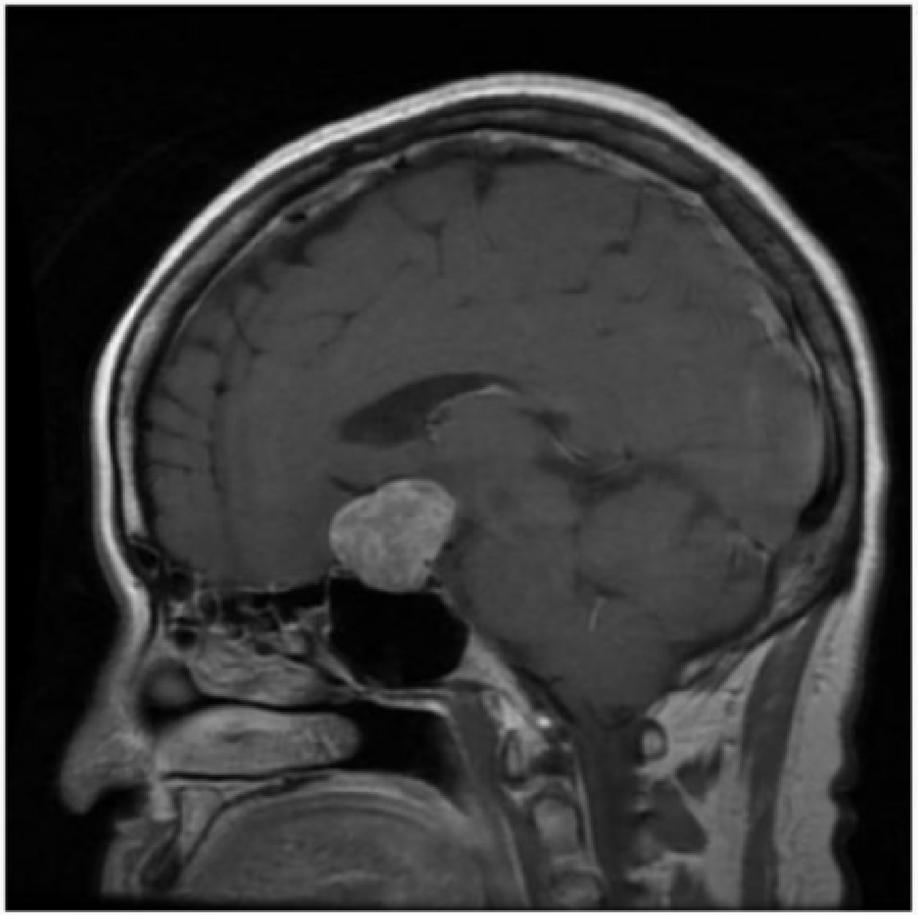


Image URL

Enter Image URL

or

Browse local files

File formats accepted: jpg, png, bmp
File size should not exceed: 4mb

Using model trained in

Iteration

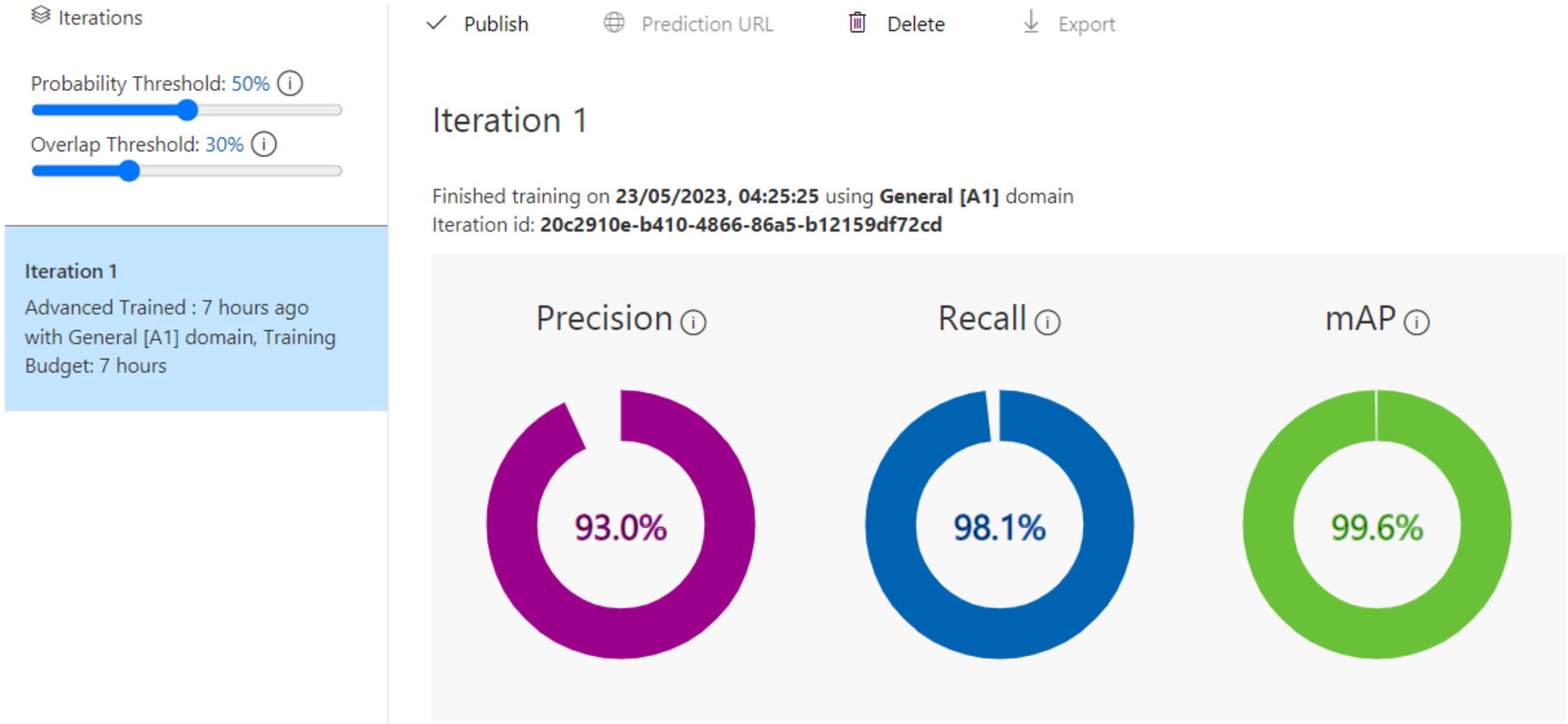
Iteration 1

Predictions

Tag	Probability
pituitary tumor	99.9%
Meningioma Tumor	0%
Glioma tumor	0%

Testing and Performance Evaluation

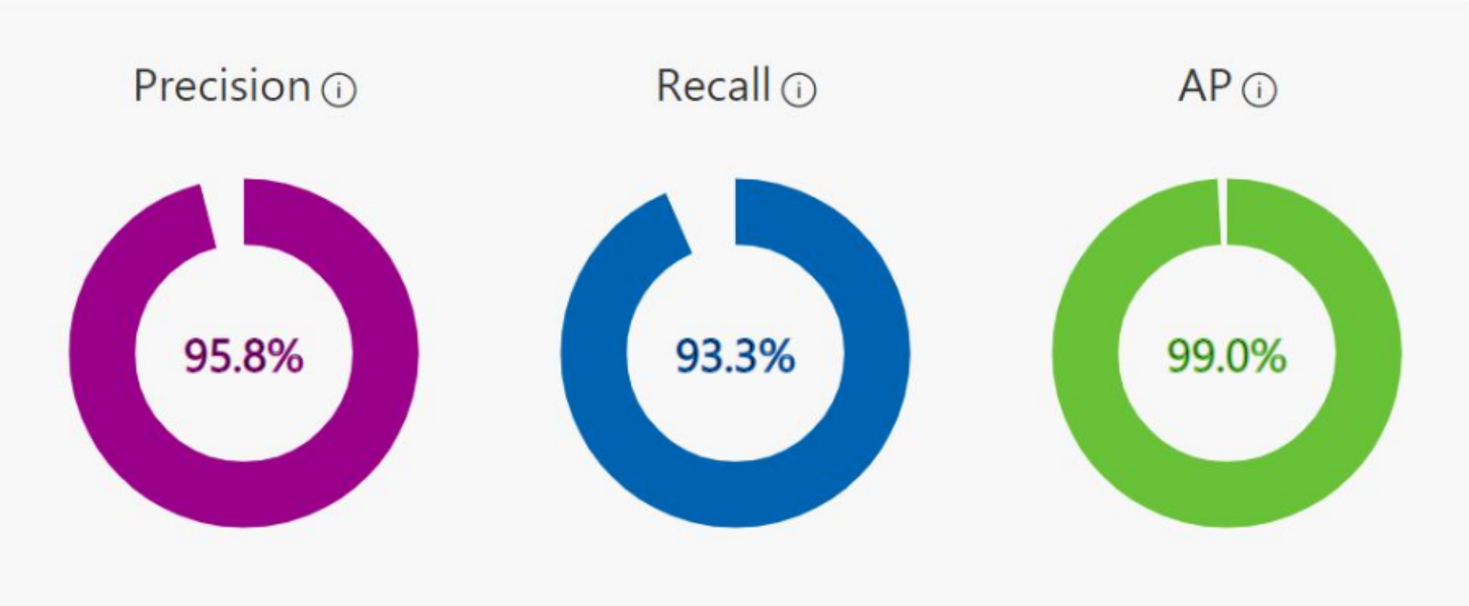
(Detection)



Testing and Performance Evaluation

(Classification)

Iteration id: **6536423f-1be5-4931-8c88-083c9124b56a**
Classification type: **Multiclass (Single tag per image)**



Performance Per Tag

Tag	Precision	Recall	A.P.	Image count
Meningioma Tumor	98.7%	89.2%	99.2%	416

Thank You