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ITAI 2372 - Artificial Intelligence Applications

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Analyzing Images with Microsoft Azure Vision Studio: Lab Report

Introduction

Performing Microsoft Azure's lab "Analyzing Images in Vision Studio", as part of the course "AI-900T00-A: Microsoft Azure AI Fundamentals", served as an intuitive experience with Azure's Vision Studio, providing practical insights into image analysis capabilities, such as caption generation, dense captioning, tagging, and object detection. In this report, I aim to share my learning experience throughout the lab, highlighting the steps taken, and challenges faced.

Description of Experience

The lab began with accessing the Azure portal using the provided credentials. While creating a new Resource, I encountered a challenge distinguishing between two similar services due to their different logos: one for Microsoft's native AI services and the other integrating OpenAI resources. After careful consideration, I selected the correct Azure AI Services resource (the native one) and connected it to Vision Studio.
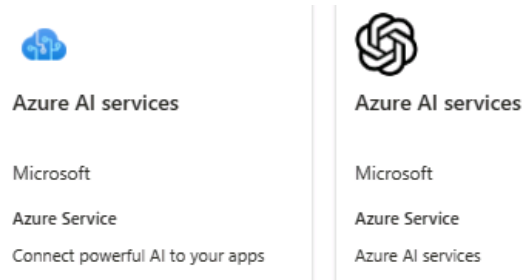
In Vision Studio, I began by analyzing and generating captions for images. I downloaded a zip folder containing four images to use in the studio. Utilizing the regular Caption feature, I observed the generated caption text in the "Detected Attributes" panel, which concisely described the image content.
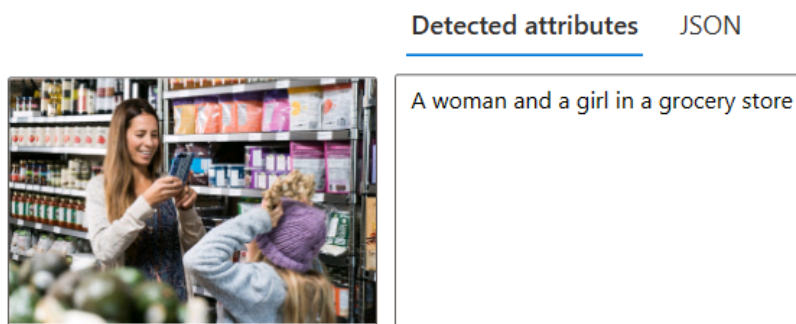
Next, I explored the Dense Captions feature. Unlike the standard Caption capability, Dense Captions provide multiple human-readable captions for an image. It offered one caption describing the overall content and additional captions for essential objects detected within the picture. Each detected object included a bounding box defining its pixel coordinates. The corresponding bounding boxes in the image were highlighted by moving the mouse cursor over the captions, illustrating the specific areas associated with each caption.

Detected attributes JSON

A woman and a girl in a grocery store
A woman smiling while holding a phone
A person holding a phone case
A woman wearing a purple hat
A woman holding a cell phone to a girl in a store
A person holding a piece of ginger
A close-up of a person wearing a purple hat
A woman smiling at a cell phone
A row of jars on a shelf
A blurry image of a person standing in a room

Detected attributes

clothing (99.04%)
person (98.26%)
convenience store (98.00%)
retail (97.88%)
supermarket (95.77%)
grocery store (94.18%)
shopping (91.96%)
customer (91.77%)

I then extracted common tags from the images using the "Prebuilt product vs. gap" model with the English language selected. The tags, "based on thousands of recognizable objects, including living beings, scenery, and actions" (Microsoft), included both nouns and verbs. Each tag came with a confidence score displayed in the "Detected Attributes" panel, indicating the likelihood that the tag accurately described the image content.

Leveraging the same model, I utilized the Object Detection feature, then adjusted the "Threshold" value slider to display a value of 70, ensuring that only objects identified with a confidence score greater than 70% were displayed.

Personal Reflection

This lab provided an insightful exploration of the practical applications of computer vision technologies within the Azure platform. The initial challenge of selecting the correct resource highlighted the importance of attention to detail when navigating cloud services. Engaging with features like dense captioning and object detection deepened my understanding of how AI models interpret and analyze visual data. Furthermore, observing the confidence scores associated with tags and objects emphasized the statistical nature of machine learning predictions.

Analyze images in Vision Studio (Expected Duration 1 hours) Details ∨
AI-900T00-A Microsoft Azure AI Fundamentals [Cloud Slice Provided], Learning Path 02 (CSS)

Required: Yes
Status: Complete

Conclusion

Completing the "Analyzing Images in Vision Studio" lab was a valuable hands-on experience with the Microsoft Azure platform. It offered practical experience with Azure's AI services, enhancing my understanding of computer vision and image analysis. The lab enhanced my technical skills, reinforced theoretical concepts learned in class, and enhanced my appreciation for the complexities involved in image analysis, contributing to my academic and professional growth.

References

Microsoft. "AI-900T00-A Microsoft Azure AI Fundamentals: Analyze images in Vision Studio",

2024, https://github.com/MicrosoftLearning/mslearn-ai-services.