

EXPERTS LIVE KENYA



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Crafting AI Driven Application with C# and Azure AI

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Introduction

Agenda

- Emergence of AI in Modern Application
- Introduction to Azure AI
- A Look at Azure AI Services
- Structure of C# Azure AI SDK
- Application Code
- Conclusion

Emergence of AI in Modern Application

Emergence of AI in Modern Application



**GitHub
Copilot**



Azure AI



Azure AI

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- Why Azure AI ?
 - Pre-configured Model
 - Ability to extend/ Create custom Models
- C# a Natural Campanian
 - Tried and Tested Enterprise Grade
 - Officially Supported SDK
 - Integrates directly into existing codebase



Speech



Search



OpenAI



Vision



Document
Intelligence

Azure AI Vision

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Image Analysis

Create Caption

Object & People Detection

Remove Background

Face Detection

Facial Recognition

Expression Recognition

Face matching and Comparison

Text Detection

Read API





Azure AI Vision

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Description Generation

Object Detection

People Detection



Azure AI Vision

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Description Generation

Object Detection

People Detection

```
Windows PowerShell x + | PS C:\Users\Saurabh\Sandbox\elk\azure-ai-vision> dotnet run

Image Analysis Results:
Caption: a man standing in front of a group of people Confidence Level: 0.8668914

Dense Caption:

a man standing in front of a group of people confidence: 0.866903
a man in a suit standing in front of a crowd confidence: 0.8114856
a blurry image of a person sitting at a table confidence: 0.82384
a blurry image of a man sitting in a chair confidence: 0.79208964
a blurry image of a man sitting in a chair confidence: 0.8346809
a blurry image of a man in a suit confidence: 0.83999264
a man standing in front of a group of people confidence: 0.86914825
the back of a man's head confidence: 0.83796835
a man in a suit confidence: 0.77278024
a group of people sitting in chairs confidence: 0.8799603
PS C:\Users\Saurabh\Sandbox\elk\azure-ai-vision> |
```



Azure AI Vision

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Description Generation

Object Detection

People Detection





Azure AI Vision

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Description Generation

Object Detection

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Azure AI Vision

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Description Generation

Object Detection

People Detection



```
void AnalyzeImage(){
    string endpoint = Environment.GetEnvironmentVariable("AZURE_AI_SERVICES_ENDPOINT")!;
    string key = Environment.GetEnvironmentVariable("AZURE_AI_SERVICES_KEY")!;
    const string imageUrl = "https://images.prismic.io/monei/918ce662-b37e-45d9-9504-91fe8ad9344f_danique-veldhuis-oDw3opEv8TM-unsplash.jpg";

    const VisualFeatures selectedVisualFeatures = VisualFeatures.Objects | VisualFeatures.People | VisualFeatures.Caption;

    ImageAnalysisClient imageAnalysisClient = new ImageAnalysisClient(
        new Uri(endpoint),
        new AzureKeyCredential(key)
    );

    ImageAnalysisResult imageAnalysisResult = imageAnalysisClient.Analyze(
        new Uri(
            imageUrl
        ),
        selectedVisualFeatures,
        new ImageAnalysisOptions { GenderNeutralCaption = false }
    );
}

if (selectedVisualFeatures.HasFlag(VisualFeatures.Caption) || selectedVisualFeatures.HasFlag(VisualFeatures.DenseCaptions))
{
    ShowImageAnalysisResult(imageAnalysisResult, imageUrl);
}
else if (selectedVisualFeatures.HasFlag(VisualFeatures.Objects))
{
    ShowDetectedObjects(imageAnalysisResult, imageUrl);
}
else if (selectedVisualFeatures.HasFlag(VisualFeatures.SmartCrops))
{
    ShowSmartCrops(imageAnalysisResult, imageUrl);
}
else
{
    System.Console.WriteLine("No captions detected in the image.");
}
```



```
const VisualFeatures selectedVisualFeatures = VisualFeatures.Objects | VisualFeatures.People | VisualFeatures.Caption;

ImageAnalysisClient imageAnalysisClient = new ImageAnalysisClient(
    new Uri(endpoint),
    new AzureKeyCredential(key)
);

ImageAnalysisResult imageAnalysisResult = imageAnalysisClient.Analyze(
    new Uri(
        imageUrl
    ),
    selectedVisualFeatures,
    new ImageAnalysisOptions { GenderNeutralCaption = false }
);
```

Azure AI NLP

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Text Analysis

Detect Language

Key-Phrase
Extraction

Sentiment
Analysis



La comida estaba
deliciosa y el personal
maravilloso.

खाना स्वादिष्ट था
और कर्मचारी बहुत
अच्छे थे।

La nourriture était
délicieuse et le
personnel merveilleux.

```
PS C:\Users\Saurabh\Sandbox\elk\az-ai-nlp> dotnet run
Detected language: Spanish (es)
```

```
-----
```

Sentiment: Positive
Positive: 1
Neutral: 0
Negative: 0

```
Detected language: Hindi (hi)
```

```
-----
```

Sentiment: Positive
Positive: 1
Neutral: 0
Negative: 0

```
Detected language: French (fr)
```

```
-----
```

Sentiment: Positive
Positive: 0.98
Neutral: 0
Negative: 0.02

```
using Azure;
using Azure.AI.TextAnalytics;

const string key = "YOUR_TEXT_ANALYTICS_SUBSCRIPTION_KEY";
const string endpointUrl = "https://azureaiservices-elk.cognitiveservices.azure.com/";

AzureKeyCredential credential = new(key);
Uri endpoint = new(endpointUrl);

💡
const string sentenceInSpanish = "La comida estaba deliciosa y el personal maravilloso.";
const string sentenceInHindi = "खाना स्वादिष्ट था और कर्मचारी बहुत अच्छे थे।";
const string sentenceInFrench = "La nourriture était délicieuse et le personnel merveilleux.";

string[] setences = new string[] { sentenceInSpanish, sentenceInHindi, sentenceInFrench };

var client = new TextAnalyticsClient(endpoint, credential);

foreach(var sentence in setences)
{
    var detectedLanguage = client.DetectLanguage(sentence);
    Console.WriteLine($"Detected language: {detectedLanguage.Value.Name} ({detectedLanguage.Value.Iso6391Name})");

    Console.WriteLine("-----");
    DocumentSentiment documentSentiment = client.AnalyzeSentiment(sentence);
    Console.WriteLine($"Sentiment: {documentSentiment.Sentiment}");
    Console.WriteLine($"Positive: {documentSentiment.ConfidenceScores.Positive}");
    Console.WriteLine($"Neutral: {documentSentiment.ConfidenceScores.Neutral}");
    Console.WriteLine($"Negative: {documentSentiment.ConfidenceScores.Negative}");
    Console.WriteLine();
}
```

Azure AI NLP

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Text Analysis

Detect Language

Key-Phrase Extraction

Sentiment Analysis

Language Understanding

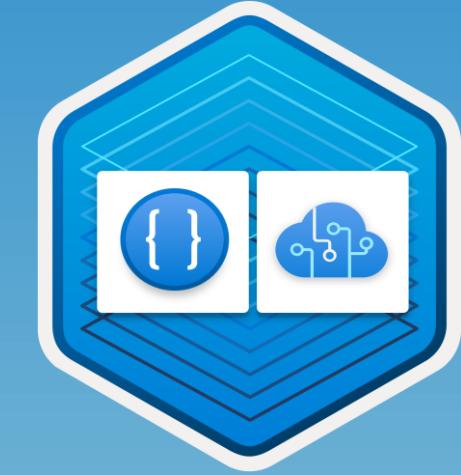
Q&A

Utterance

Text Summarization

Translation

Transliteration





Azure AI Search

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Azure AI Document Intelligence

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- Recognize the document fields automatically
- Prebuilt models
 - Read
 - General Document
 - Layout
- Specific Document Model



Structure Revisited

Azure Subscription

Azure AI
Resource

Code

Individual
AI
Resource

Combined
AI
Resource

SDK

API

Key

Endpoint

Client

Key

Endpoint

Conclusion



THANK YOU

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Session

Feedback

Session Track:

Session Name: Crafting AI Driven Application with C# and Azure AI

Experts Live KE 2024 Attendee
Feedback

