2.7 - Analyze video

Overview

Azure Video Indexer is a service to extract insights from video, including face identification, text recognition, object labels, scene segmentations, and more.

Learning objectives

After completing this module, you'll be able to:

- Describe Azure Video Indexer capabilities
- Extract custom insights
- Use Azure Video Indexer widgets and APIs

Introduction

It's increasingly common for organizations and individuals to generate content in video format. For example, you might use a cellphone to capture a live event, or you might record a teleconference that combines webcam footage and presentation of slides or documents. As a result, a great deal of

information is encapsulated in video files, and you may need to extract this information for analysis or to support indexing for searchability.

In this module, you will learn how to use the **Azure Video Indexer** service to analyze videos.

After completing this module, you'll be able to:

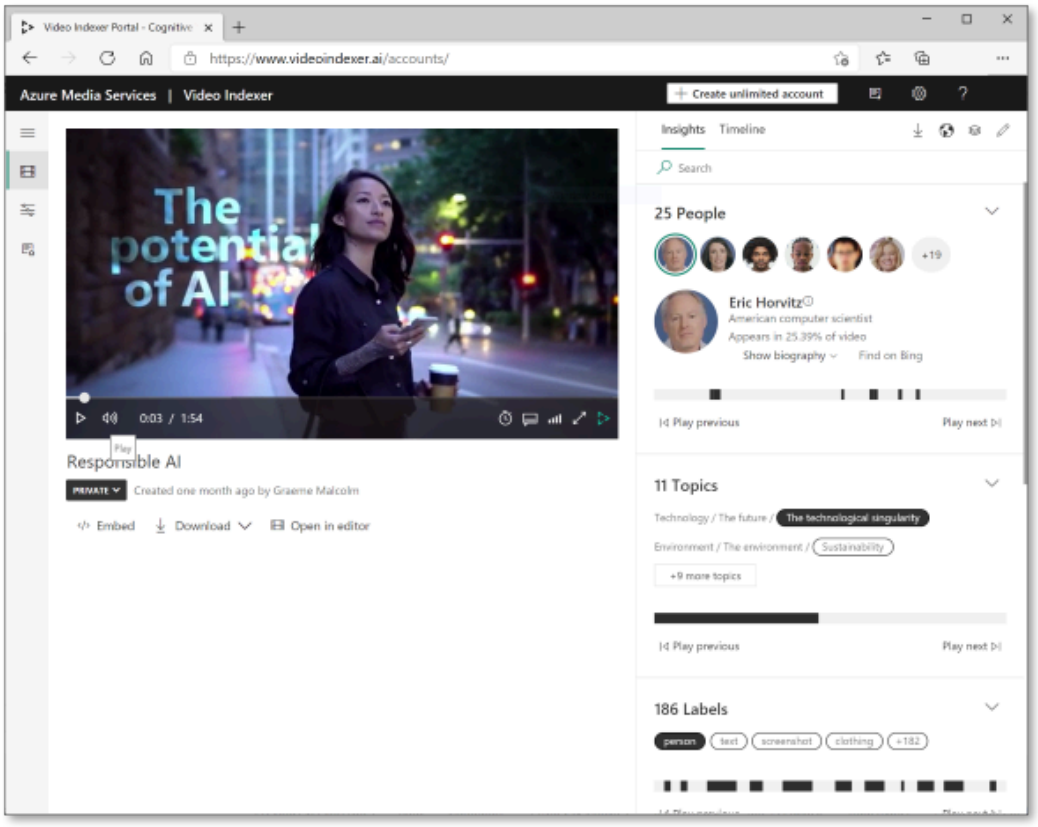
- Describe Azure Video Indexer capabilities.
- Extract custom insights.
- Use Azure Video Indexer widgets and APIs.

Understand Azure Video Indexer capabilities

The **Azure Video Indexer** service is designed to help you extract information from videos. It provides functionality that you can use for:

- *Facial recognition* - detecting the presence of individual people in the image. This requires Limited Access approval.
- *Optical character recognition* - reading text in the video.
- *Speech transcription* - creating a text transcript of spoken dialog in the video.
- *Topics* - identification of key topics discussed in the video.
- *Sentiment* - analysis of how positive or negative segments within the video are.
- *Labels* - label tags that identify key objects or themes throughout the video.
- *Content moderation* - detection of adult or violent themes in the video.
- *Scene segmentation* - a breakdown of the video into its constituent scenes.

The Video Analyzer service provides a portal website that you can use to upload, view, and analyze videos interactively.



Extract custom insights

Azure Video Indexer includes predefined models that can recognize well-known celebrities, do OCR, and transcribe spoken phrases into text. You can extend the recognition capabilities of Video Analyzer by creating custom models for:

- **People**. Add images of the faces of people you want to recognize in videos, and train a model. Video Indexer will then recognize these people in all of your videos.

  > Note: This only works after Limited Access approval, adhering to our Responsible AI standard.

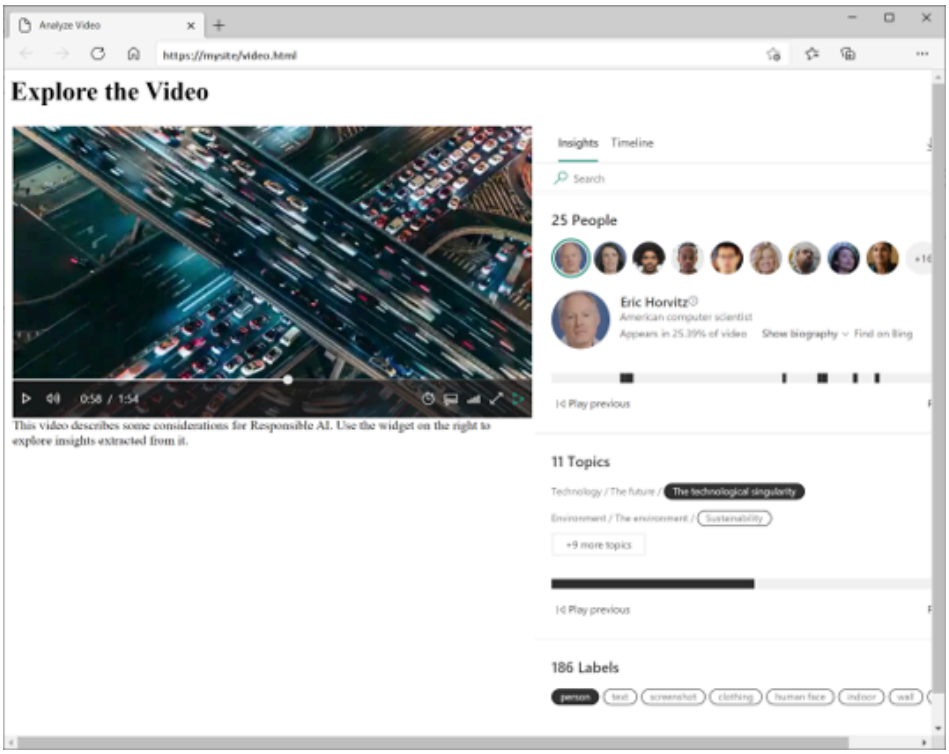
- **Language**. If your organization uses specific terminology that may not be in common usage, you can train a custom model to detect and transcribe it.
- **Brands**. You can train a model to recognize specific names as brands, for example to identify products, projects, or companies that are relevant to your business.

Use Video Analyzer widgets and APIs

While you can perform all video analysis tasks in the Azure Video Indexer portal, you may want to incorporate the service into custom applications. There are two ways you can accomplish this.

Azure Video Indexer widgets

The widgets used in the Azure Video Indexer portal to play, analyze, and edit videos can be embedded in your own custom HTML interfaces. You can use this technique to share insights from specific videos with others without giving them full access to your account in the Azure Video Indexer portal.



Azure Video Indexer API

Azure Video Indexer provides a REST API that you can use to obtain information about your account, including an access token.

```
https://api.videoindexer.ai/Auth/<location>/Accounts/<accountId>/AccessToken
```

You can then use your token to consume the REST API and automate video indexing tasks, creating projects, retrieving insights, and creating or deleting custom models.

For example, a GET call to `https://api.videoindexer.ai/<location>/Accounts/<accountId>/Customization/CustomLogos/Logos/<logoId>?<accessToken>` REST endpoint returns the specified logo.

In another example, you can send a GET request to `https://api.videoindexer.ai/<location>/Accounts/<accountId>/Videos?<accessToken>`, which returns details of videos in your account, similar to the following JSON example:

```
{
    "accountId": "SampleAccountId",
    "id": "30e66ec1b1",
    "partition": null,
    "externalId": null,
    "metadata": null,
    "name": "test3",
    "description": null,
    "created": "2018-04-25T16:50:00.967+00:00",
    "lastModified": "2018-04-25T16:58:13.409+00:00",
    "lastIndexed": "2018-04-25T16:50:12.991+00:00",
    "privacyMode": "Private",
    "userName": "SampleUserName",
```

```
    "isOwned": true,
    "isBase": true,
    "state": "Processing",
    "processingProgress": "",
    "durationInSeconds": 13,
    "thumbnailVideoId": "30e66ec1b1",
    "thumbnailId": "55848b7b-8be7-4285-893e-cdc366e09133",
    "social": {
        "likedByUser": false,
        "likes": 0,
        "views": 0
    },
    "searchMatches": [],
    "indexingPreset": "Default",
    "streamingPreset": "Default",
    "sourceLanguage": "en-US"
}
```


Deploy with ARM template

Azure Resource Manager (ARM) templates are available to create the Azure AI Video Indexer resource in your subscription, based on the parameters specified in the template file.

For a full list of available APIs, see the Video Indexer Developer Portal.

Exercise - Analyze video

A large proportion of the data created and consumed today is in the format of video. **Azure AI Video Indexer** is an AI-powered service that you can use to index videos and extract insights from them.

> **Note**: From June 21st 2022, capabilities of Azure AI services that return personally identifiable information are restricted to customers who have been granted limited access. Without getting limited access approval, recognizing people and celebrities with Video Indexer for this lab is not available. For more details about the changes Microsoft has made, and why - see Responsible AI investments and safeguards for facial recognition.

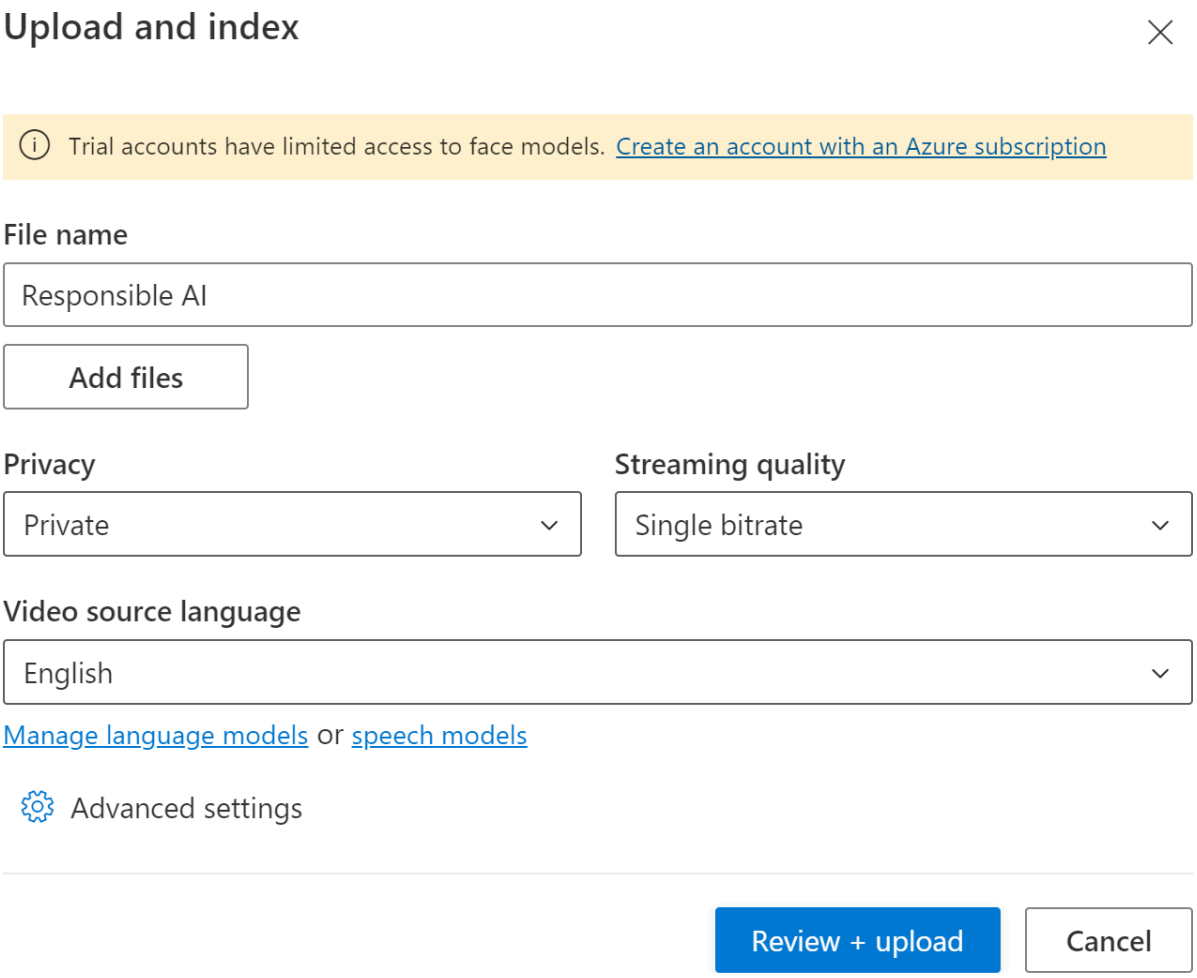
Upload a video to Video Indexer

First, you'll need to sign into the Video Indexer portal and upload a video.

> **Tip**: If the Video Indexer page is slow to load in the hosted lab environment, use your locally installed browser. You can switch back to the hosted VM for the later tasks.

1. In your browser, open the Video Indexer portal at `https://www.videoindexer.ai`.
2. If you have an existing Video Indexer account, sign in. Otherwise, sign up for a free account and sign in using your Microsoft account (or any other valid account type). If you have difficulty signing in, try opening a private browser session.
3. In a new tab, download the Responsible AI video by visiting `https://aka.ms/responsible-ai-video`. Save the file.

4. In Video Indexer, select the **Upload** option. Then select the option to **Browse for files**, select the downloaded video, and click **Add**. Change the default name to **Responsible AI**, review the default settings, select the checkbox to verify compliance with Microsoft's policies for facial recognition, and upload the file.
5. After the file has uploaded, wait a few minutes while Video Indexer automatically indexes it.



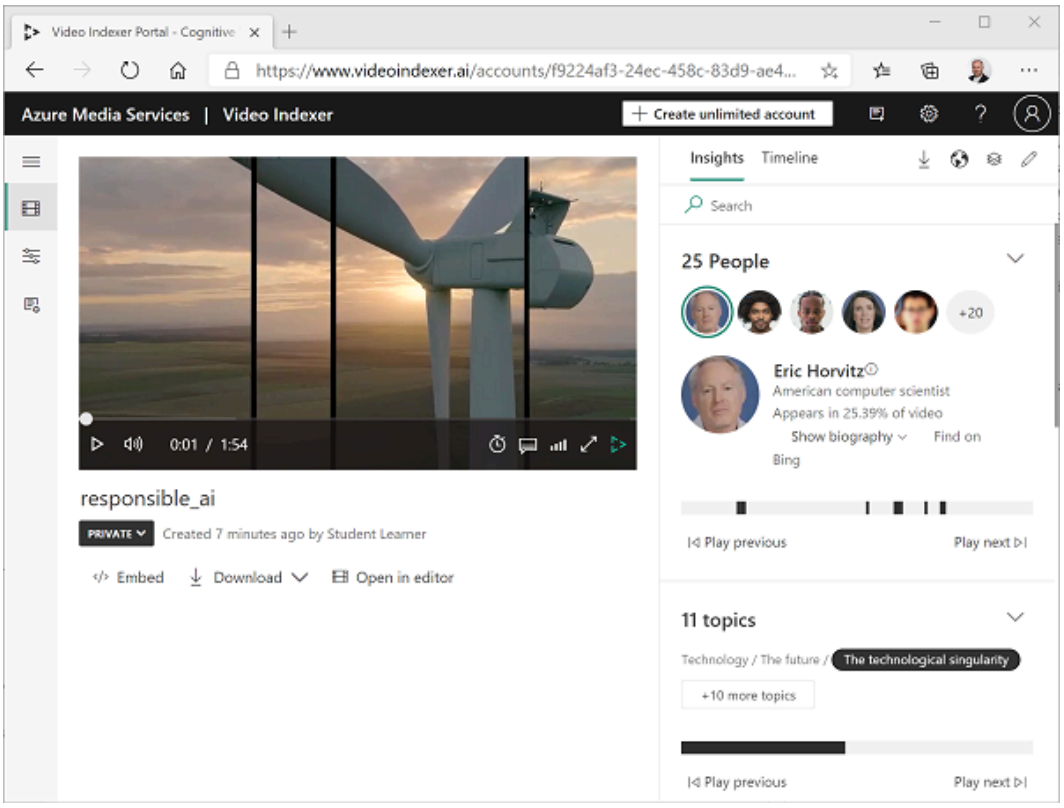
> **Note**: In this exercise, we're using this video to explore Video Indexer functionality; but you should take the time to watch it in full when you've finished the exercise as it contains useful information and guidance for developing AI-enabled applications responsibly!

Review video insights

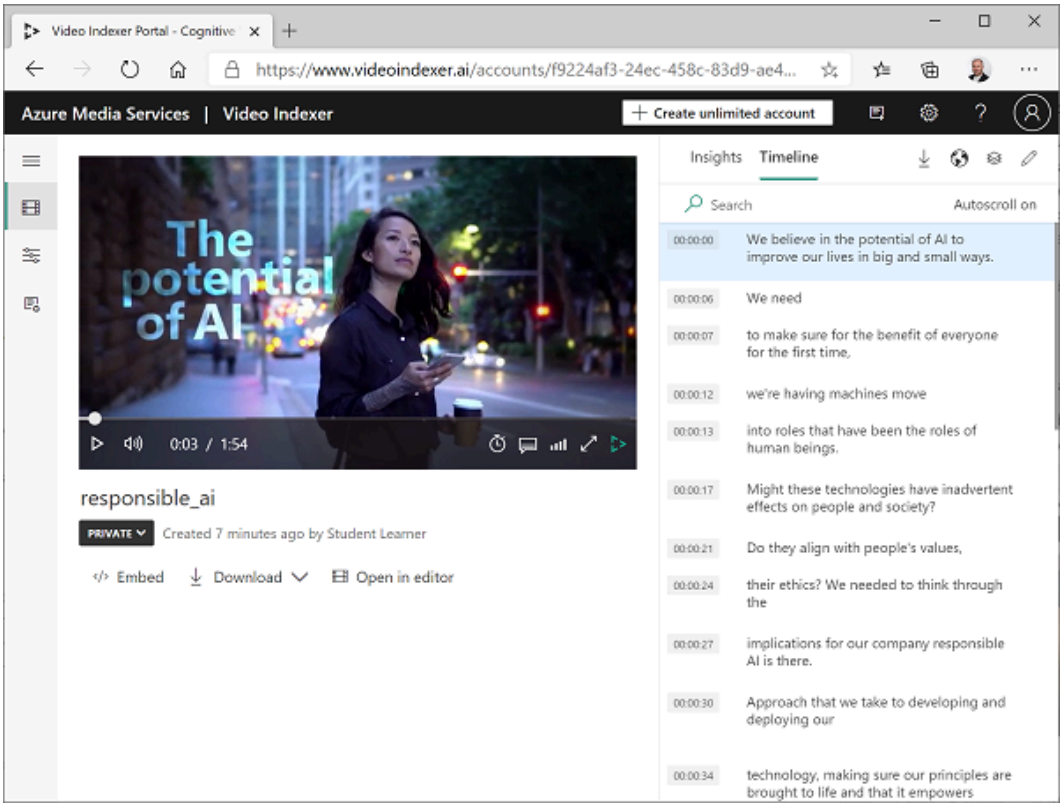
The indexing process extracts insights from the video, which you can view in the portal.

1. In the Video Indexer portal, when the video is indexed, select it to view it. You'll see the video player alongside a pane that shows insights extracted from the video.

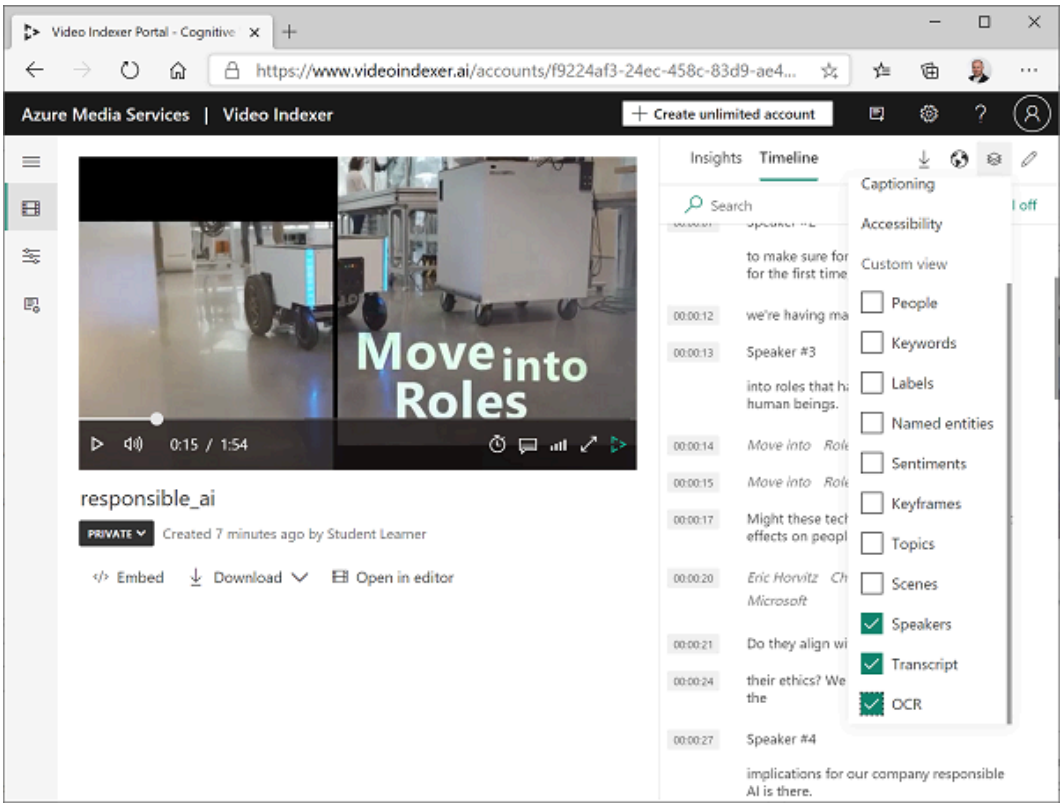
> **Note**: Due to the limited access policy to protect individuals identities, you may not see names when you index the video.



2. As the video plays, select the **Timeline** tab to view a transcript of the video audio.



3. At the top right of the portal, select the **View** symbol (which looks similar to), and in the list of insights, in addition to **Transcript**, select **OCR** and **Speakers**.



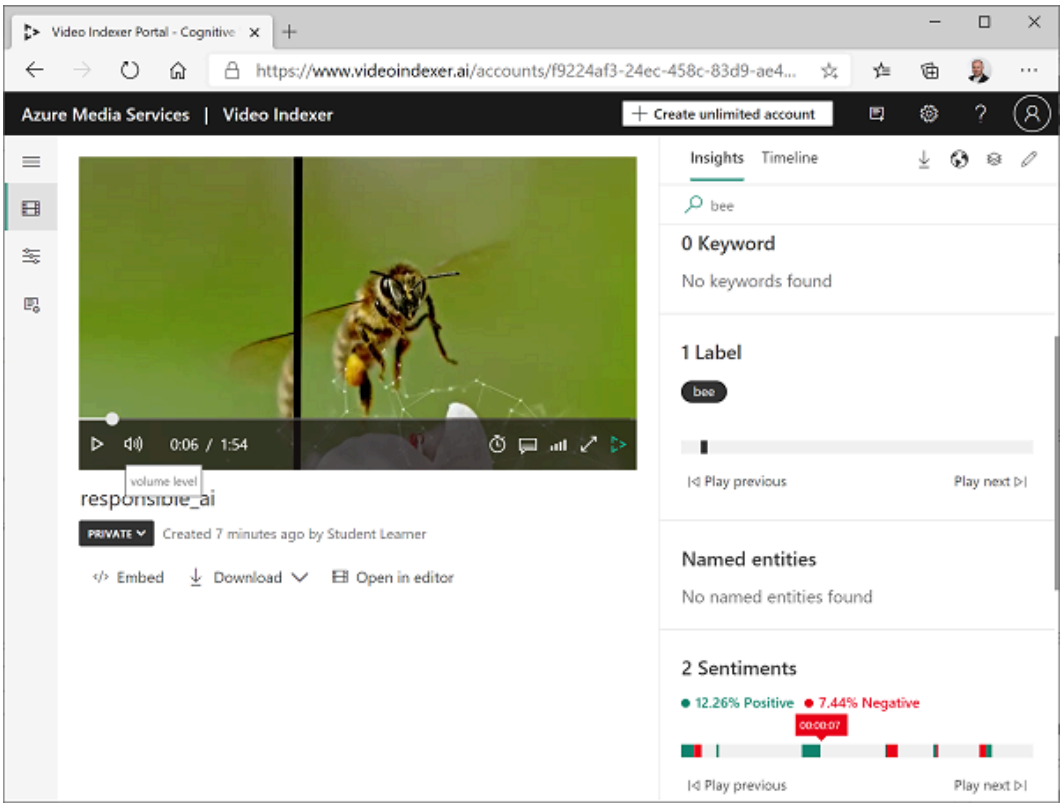
4. Observe that the **Timeline** pane now includes:
    - Transcript of audio narration.
    - Text visible in the video.
    - Indications of speakers who appear in the video. Some well-known people are automatically recognized by name, others are indicated by number (for example *Speaker #1*).
5. Switch back to the **Insights** pane and view the insights show there. They include:
    - Individual people who appear in the video.
    - Topics discussed in the video.
    - Labels for objects that appear in the video.
    - Named entities, such as people and brands that appear in the video.
    - Key scenes.
6. With the **Insights** pane visible, select the **View** symbol again, and in the list of insights, add **Keywords** and **Sentiments** to the pane.

    The insights found can help you determine the main themes in the video. For example, the **topics** for this video show that it is clearly about technology, social responsibility, and ethics.

Search for insights

You can use Video Indexer to search the video for insights.

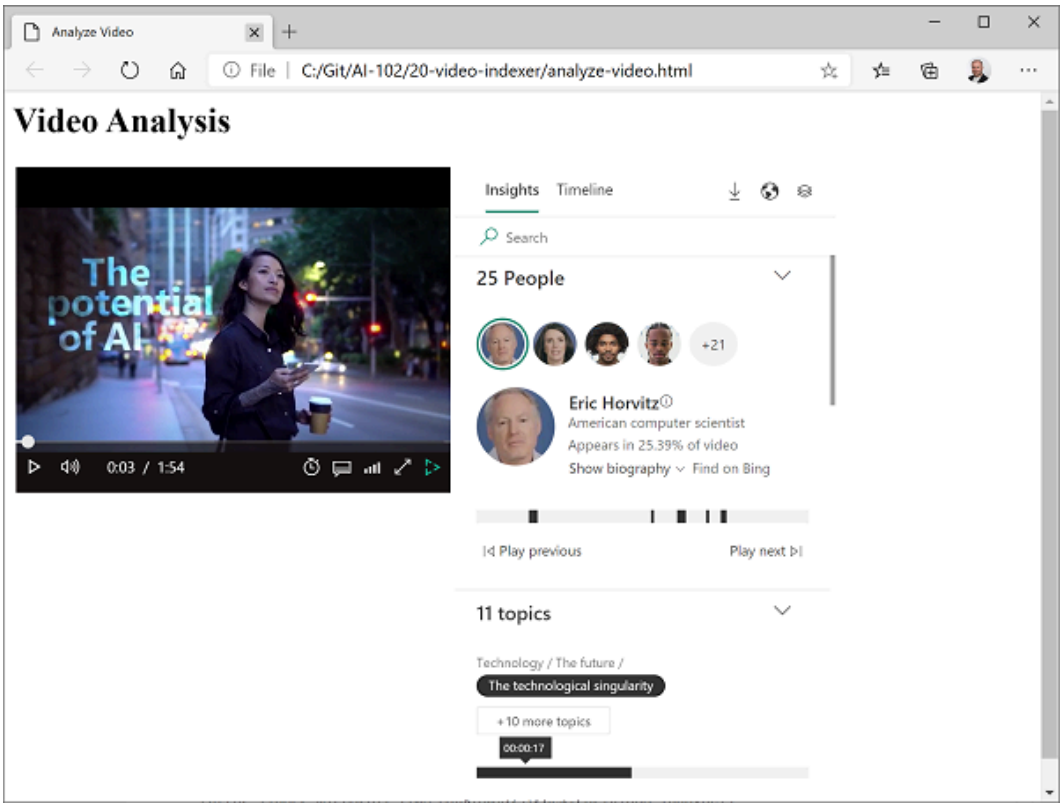
1. In the **Insights** pane, in the **Search** box, enter *Bee*. You may need to scroll down in the Insights pane to see results for all types of insight.
2. Observe that one matching *label* is found, with its location in the video indicated beneath.
3. Select the beginning of the section where the presence of a bee is indicated, and view the video at that point (you may need to pause the video and select carefully - the bee only appears briefly!)
4. Clear the **Search** box to show all insights for the video.



Use Video Indexer widgets

The Video Indexer portal is a useful interface to manage video indexing projects. However, there may be occasions when you want to make the video and its insights available to people who don't have access to your Video Indexer account. **Video Indexer provides widgets that you can embed in a web page** for this purpose.

1. In Visual Studio Code, in the **06-video-indexer** folder, open **analyze-video.html**. This is a basic HTML page to which you will add the Video Indexer **Player** and **Insights** widgets. Note the reference to the **vb.widgets.mediator.js** script in the header - this script enables multiple Video Indexer widgets on the page to interact with one another.
2. In the Video Indexer portal, return to the **Media files** page and open your **Responsible AI** video.
3. Under the video player, select **</> Embed** to view the HTML iframe code to embed the widgets.
4. In the **Share and Embed** dialog box, select the **Player** widget, set the video size to 560 x 315, and then copy the embed code to the clipboard.
5. In Visual Studio Code, in the **analyze-video.html** file, paste the copied code under the comment **<-- Player widget goes here -- >**.
6. Back in the **Share and Embed** dialog box, select the **Insights** widget and then copy the embed code to the clipboard. Then close the **Share and Embed** dialog box, switch back to Visual Studio Code, and paste the copied code under the comment **<-- Insights widget goes here -- >**.
7. Save the file. Then in the **Explorer** pane, right-click **analyze-video.html** and select **Reveal in File Explorer**.
8. In File Explorer, open **analyze-video.html** in your browser to see the web page.
9. Experiment with the widgets, using the **Insights** widget to search for insights and jump to them in the video.



Use the Video Indexer REST API

Video Indexer provides a REST API that you can use to **upload and manage videos in your account.**

Get your API details

To use the Video Indexer API, you need some information to authenticate requests:

1. In the Video Indexer portal, expand the left pane and select the **Account settings** page.
2. Note the **Account ID** on this page - you will need it later.
3. Open a new browser tab and go to the Video Indexer developer portal at `https://api-portal.videoindexer.ai`, signing in using the credentials for your Video Indexer account.
4. On the **Profile** page, view the **Subscriptions** associated with your profile.
5. On the page with your subscription(s), observe that you have been assigned two keys (primary and secondary) for each subscription. Then select **Show** for any of the keys to see it. You will need this key shortly.

Use the REST API

Now that you have the account ID and an API key, you can use the **REST API to work with videos in your account.** In this procedure, you'll use a PowerShell script to make REST calls; but the same principles apply with HTTP utilities such as cURL or Postman, or any programming language capable of sending and receiving JSON over HTTP.

All interactions with the Video Indexer REST API follow the same pattern:

- An initial request to the **AccessToken** method with the API key in the header is used to obtain an access token.
- Subsequent requests use the access token to authenticate when calling REST methods to work with videos.

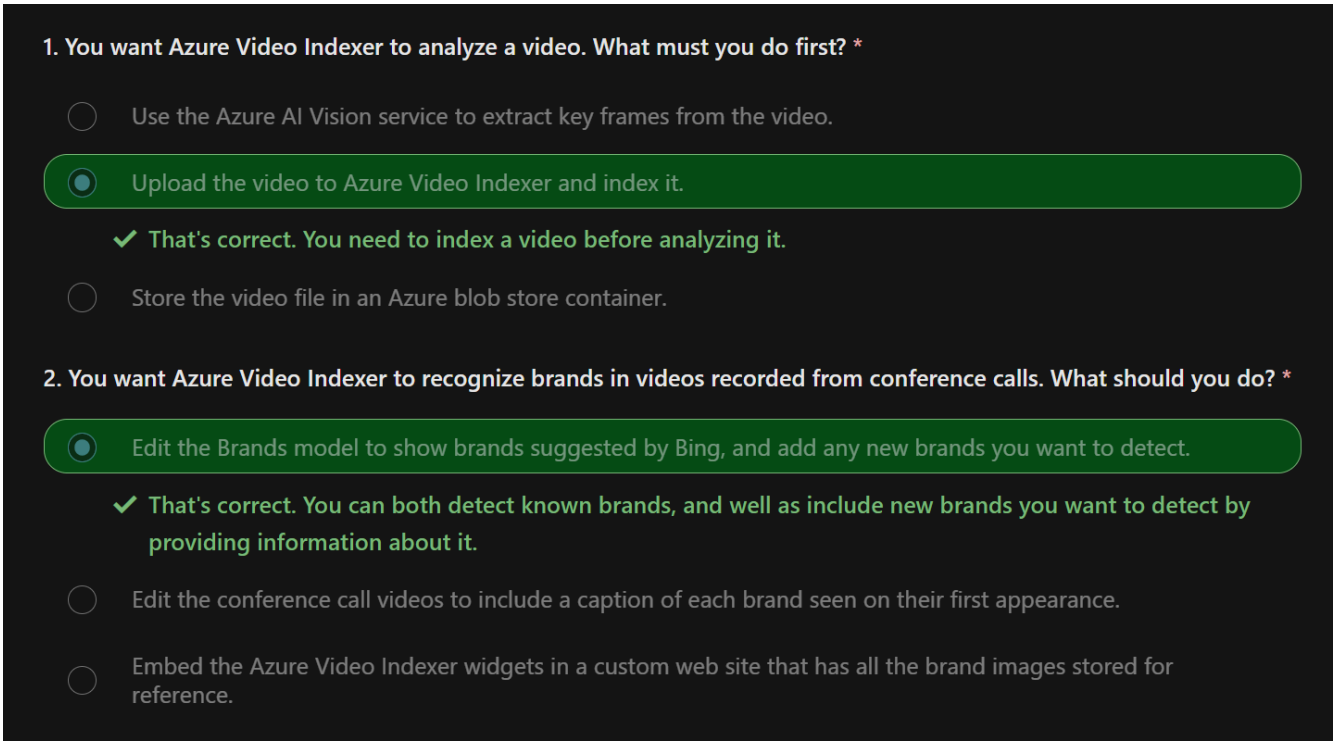
1. In Visual Studio Code, in the **06-video-indexer** folder, open **get-videos.ps1**.
2. In the PowerShell script, replace the **YOUR_ACCOUNT_ID** and **YOUR_API_KEY** placeholders with the account ID and API key values you identified previously.
3. Observe that the *location* for a free account is "trial". If you have created an unrestricted Video Indexer account (with an associated Azure resource), you can change this to the location where your Azure resource is provisioned (for example "eastus").
4. Review the code in the script, noting that **invokes two REST methods: one to get an access token, and another to list the videos in your account.**
5. Save your changes, and then at the top-right of the script pane, use the ▷ button to run the script.
6. View the JSON response from the REST service, which should contain details of the **Responsible AI** video you indexed previously.

More information

Recognition of people and celebrities is still available, but following the Responsible AI Standard those are restricted behind a Limited Access policy. These features include facial identification and celebrity recognition. To learn more and apply for access, see the Limited Access for Azure AI Services.

For more information about **Video Indexer**, see the Video Indexer documentation.

Knowledge Check



> Azure AI Video Indexer **brand** detection enables you to index brand mentions in speech and visual text, using Bing's brands database as well as with customization by building a custom Brands model for each Azure AI Video Indexer account. The custom Brands model feature allows you to select whether or not Azure AI Video Indexer will detect brands from the Bing brands database, exclude certain brands from being detected (essentially creating a list of unapproved brands), and include brands that should be part of your model that might not be in Bing's brands database (essentially creating a list of approved brands).

> More about Brands model: Customize a Brands model in Azure AI Video Indexer - Azure | Microsoft Learn.

Summary

In this module, you learned how to use the Azure Video Indexer service to analyze videos.

Now that you've completed this module, you can:

- Describe Azure Video Indexer capabilities.
- Extract custom insights.
- Use Azure Video Indexer widgets and APIs.

To find out more about the Azure Video Indexer service, see the Azure Video Indexer documentation.

✍️ Compiled by Kenneth Leung (2025)