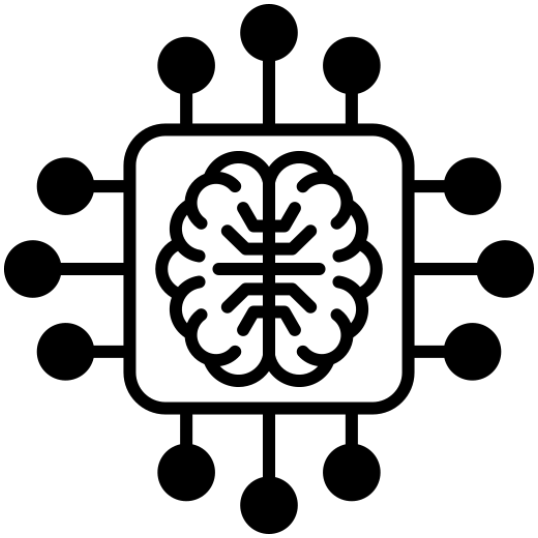
SBS4115 Fundamentals of AI & Data Analytics



Practical Applications and Project Work II

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Intended Learning Outcomes

- By the end of this project, you will be able to:
  1. Develop a computer vision AI model using Teachable Machine.
  2. Present your findings and demonstrate your AI model effectively.

Group Project

- Presentation and Submission Date: 25 Nov 2024
- Number of Students per Group: 2 to 3
- Submission Method: Submit your presentation file in PowerPoint format on Moodle.
- You need to send at least 1 representative to do the 10-minute presentation on 25 Nov 2024.

Presentation Structure

Introduction:

Objective and Goals:

Methodology

Demonstration:

Results and Analysis:

Applications and Future Work

Conclusion

Additional Instructions

The project should be engineering-related applications of AI computer vision. You can follow the suggested topics or find a new topic yourselves.

Choose a group leader who will be responsible for submitting the project on Moodle.

Indicate who is the group leader in your PowerPoint slide.

In your presentation deck, state the name of all the teammates.

Introduction

Name of teammates

- Please use the **official name on your HK identity card.**

Briefly introduce the project and its relevance to engineering or construction.

- What is the engineering problem you are aiming to solve?

State the problem or need that the project addresses.

- Explain more about the problem

Objective and Goals

Clearly outline the main objectives and goals of the project.

- Mention what you want to achieve
- What problem has been solved if your goals have been achieved

Explain what you are aiming to achieve with your AI model.

- Why AI is important in this project?
- How do people solve the problem currently without AI?

Methodology

Describe the process of creating the model using Teachable Machine.

- How did you use Teachable Machine to train the model?
- Include details on data collection, model training, and any preprocessing steps.
- Talk more about how did you collect data (from internet or take photos by yourselves?), how did you select the photos

Mention any challenges faced and how they were overcome.

Demonstration

Provide a live demonstration of the model in action.

- Not just successful data but demonstrate when your model fails.

Show how the model performs its task (e.g., classifying materials, detecting poses).

Highlight key features and functionalities.

- You can give an example how the model can be deployed in hardware (e.g. hand-held device for material classification, portable/stationary posture detection device/equipment)

Results and Analysis

Present the results of the model's performance.

Use visuals like graphs or charts to illustrate accuracy, precision, and other metrics.

-e.g. what's the percentage of successful rate.

Discuss any interesting findings or insights gained from the project.

- How does factors like lighting, contrast, resolution of pictures affect the performance of the model.

Applications and Future Work

Explain the practical applications of the project in the engineering or construction field.
-Elaborate more on how your invention can benefit the engineering sector.

Suggest potential improvements or future enhancements for the model.

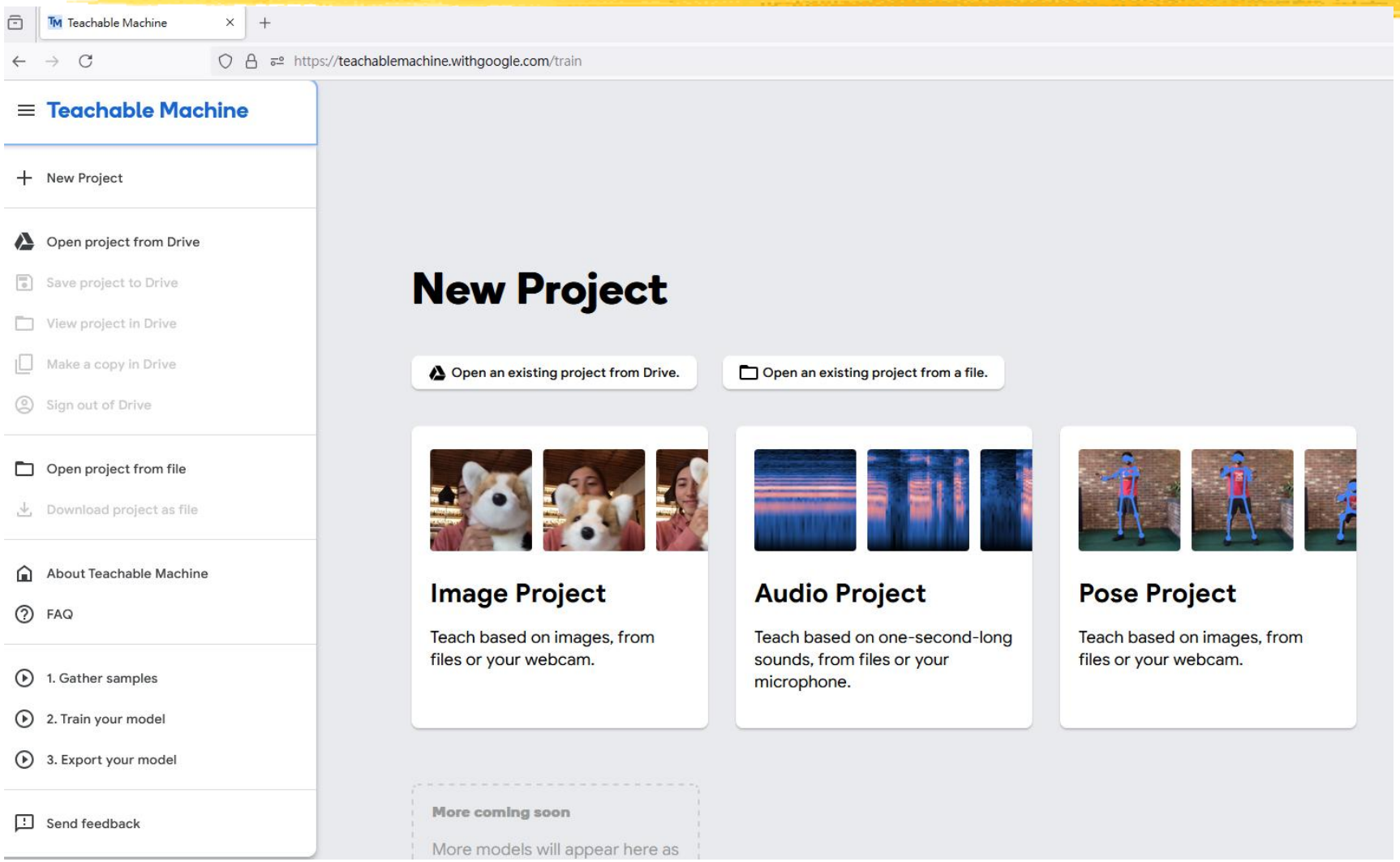
Conclusion

Summarize the key points of the presentation.

Reiterate the importance and impact of the project.

Open the floor for any questions from the audience.

Revision on Teachable Machine



Teachable Machine

- Visit Teachable Machine (https://teachablemachine.withgoogle.com/)
- Overview of the interface
- Types of projects: Image, Audio, Pose

Gather data

Step 1: Open Google Chrome

- Make sure you are using Google Chrome on your computer.

Step 2: Open Chrome Web Store

- In the Chrome browser, navigate to the Chrome Web Store by entering this URL in the address bar: https://chrome.google.com/webstore.
- This is where you can find all the extensions available for Chrome.

Gather data

Step 3: Search for an Image Downloader Extension

- In the Chrome Web Store, there is a search bar at the top left.
- Type "Image Downloader" or "Batch Image Downloader" into the search bar and press Enter.
- Some recommended extensions for downloading images in bulk include:
  - Image Downloader
  - Fatkun Batch Download Image

Step 4: Install the Extension

- In the list of results, find the extension you want to use (e.g., Image Downloader or Fatkun Batch Download Image).
- Click on the extension name to view details about it.
- On the extension’s page, click the Add to Chrome button in the top right corner.

Gather data

Step 5: Confirm Installation

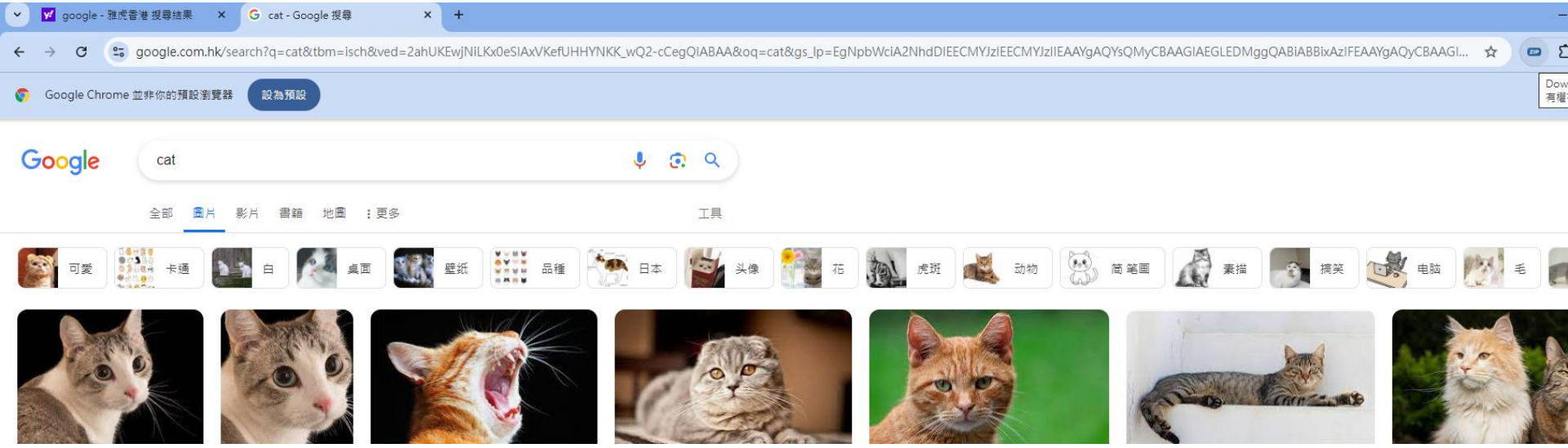
- A pop-up will appear asking you to confirm the installation of the extension.
- Click Add Extension to proceed.
- Chrome will now download and install the extension. Once installed, you'll see the extension's icon in the top-right corner of your browser (next to the address bar).

Gather data

Step 6: Use the Extension to Download Images in Bulk

- Go to Google Images or any webpage where you want to download images.

  For example, search for “cats" in Google Images.
- Click the extension’s icon in the top-right corner of Chrome (next to the address bar).
- The extension will scan the page and list all the images it has found.
- Select the images you want to download, or use the Select All option if you want to download all the images.
- Click the Download or similar button to save all the selected images to your computer.



Teachable Machine

Train the AI model

- Click “Train Model” button
- Overview of training process
- Adjusting parameters (optional)

Teachable Machine

Test and Evaluate

- Test the model with new examples
- Evaluate performance
- Make adjustments if necessary

Checklist

- Can you:
  1. Develop a computer vision AI model using Teachable Machine.
  2. Present your findings and demonstrate your AI model effectively.