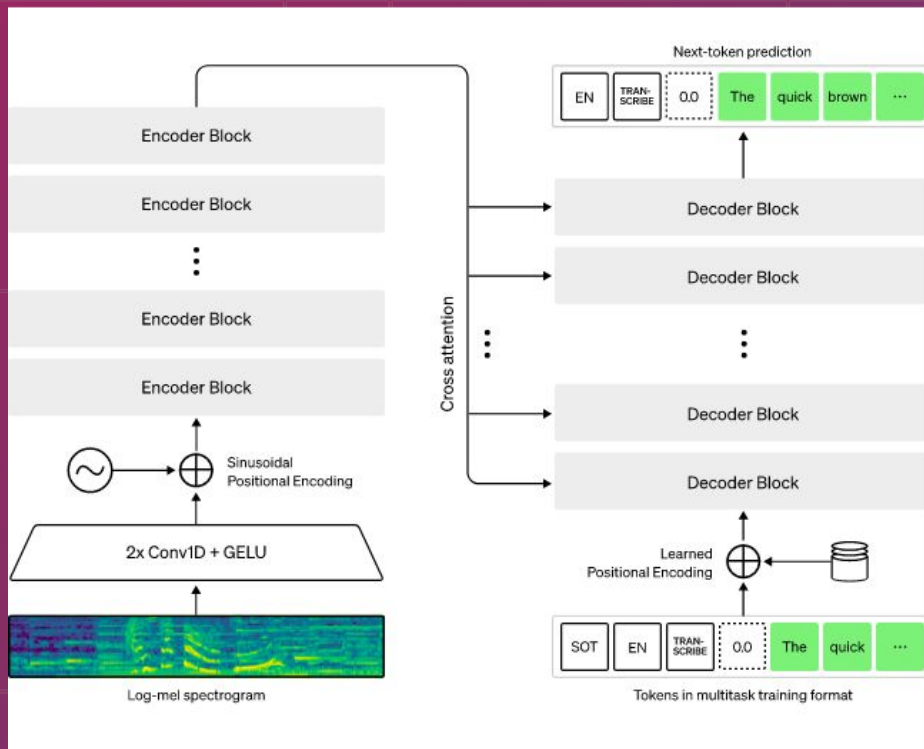


Lab 2

ID2223 / HT2022

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Swedish Text Transcription using Transformers

Course Material: Prof Jim Dowling

Source Code for Lab 2

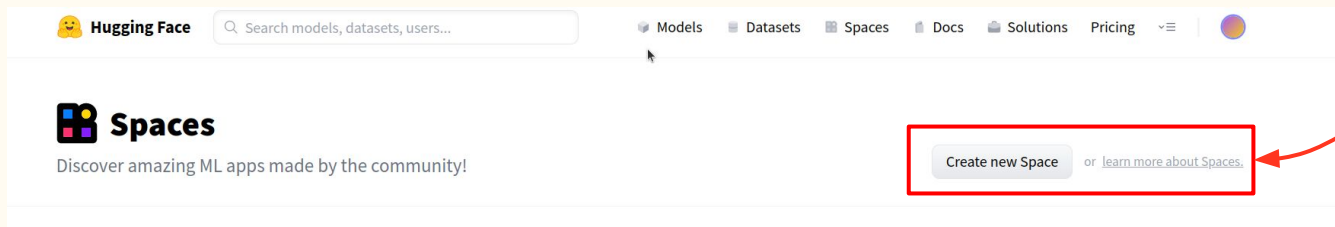
- Source Code Github
- Use Conda or virtual environments to manage your python dependencies on your laptop. [See more info on how to manage your Python environment here.](#)

Fine-Tune a Transformer For Swedish Language Transcription

Task 1: Fine-tune a model for language transcription, add a UI

- Fine-Tune a pre-trained transformer model and build a serverless UI for using that model
- **First Steps**
 - a. Create a free account on huggingface.com
 - b. Create a free account on google.com for [Colab](https://colab.google)
- **Tasks**
 - a. Fine-tune an existing pre-trained transformer model for the Swedish language, [such as Whisper](#)
 - b. Build and run an inference pipeline with a Gradio UI on Hugging Face Spaces for your model.

Register and Create a Hugging Face Space

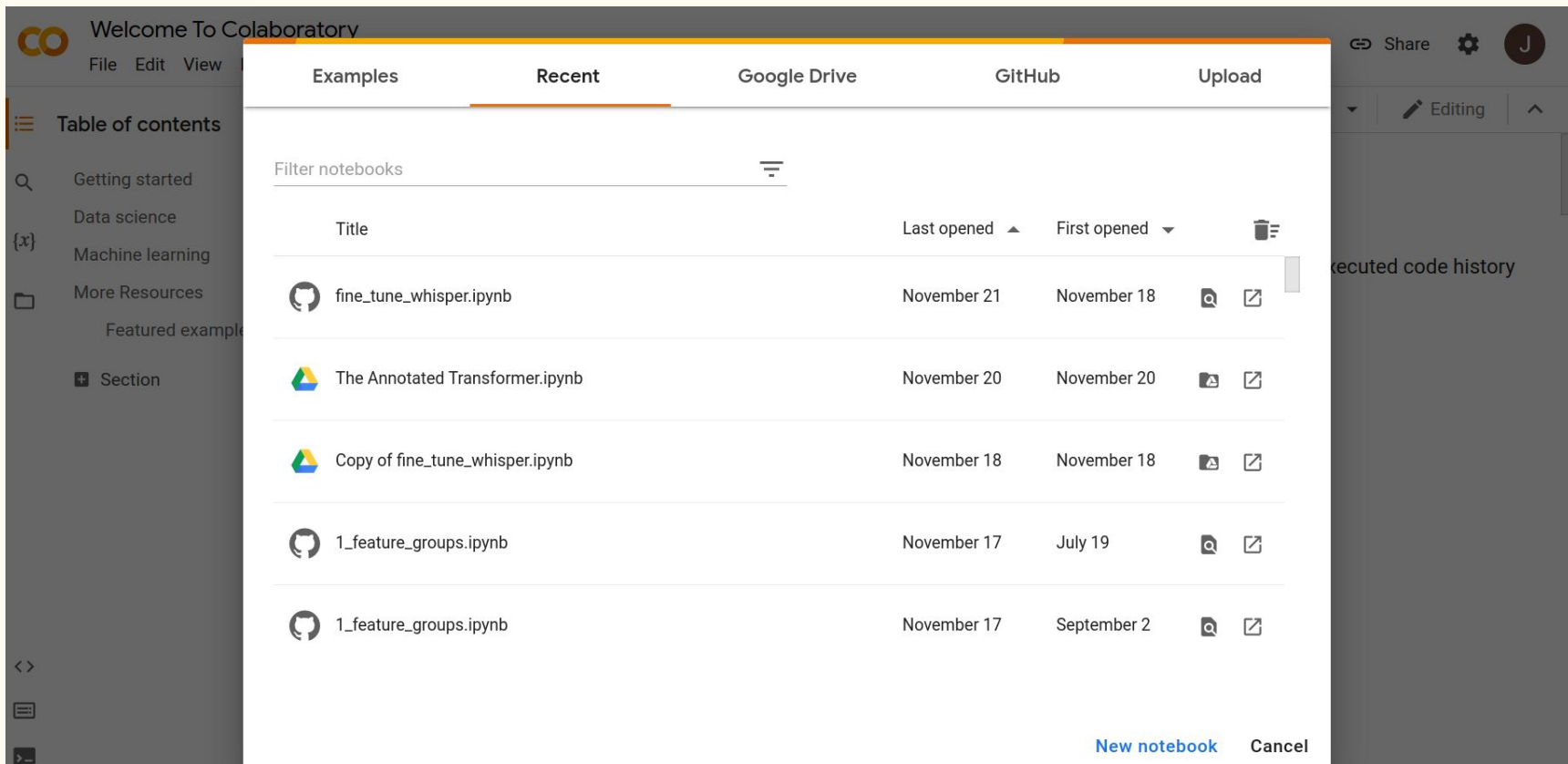


1. Create an account on Hugging Face
2. Create a "Space"

The screenshot shows the 'Create a new Space' form. The form has a title 'Create a new Space' and a description: 'A Space is a special kind of repository that hosts application code for Machine Learning demos. Those applications can be written using Python libraries like [Streamlit](#) or [Gradio](#).' The form includes fields for 'Owner' (set to 'jdwoling') and 'Space name' (set to 'iris'). The 'License' is set to 'apache-2.0'. Under 'Select the Space SDK', three options are shown: Streamlit, Gradio (selected and highlighted with a yellow border), and Static. Below the SDK selection, there are radio buttons for 'Public' (selected) and 'Private'. The 'Public' option is described as 'Anyone on the internet can see this space. Only you (personal space) or members of your organization (organization space) can commit.' The 'Private' option is described as 'Only you (personal space) or members of your organization (organization space) can see and commit to this space.' At the bottom, there is a 'Create space' button.

3. Create a Gradio App with the name Iris inside your account

Register and Create an account on Google for Colab


















The screenshot displays the Google Colaboratory interface. On the left is a sidebar with a 'Table of contents' and a search bar. The main area shows the 'Recent' tab with a list of notebooks. The notebooks are sorted by 'Last opened' date. The first notebook is 'fine_tune_whisper.ipynb', followed by 'The Annotated Transformer.ipynb', 'Copy of fine_tune_whisper.ipynb', and two instances of '1_feature_groups.ipynb'. Each notebook entry includes a title, a last opened date, a first opened date, and icons for search and share. At the bottom right, there are buttons for 'New notebook' and 'Cancel'.

Welcome To Colaboratory

File Edit View

Examples Recent Google Drive GitHub Upload

Filter notebooks

Title	Last opened ▲	First opened ▼	
 fine_tune_whisper.ipynb	November 21	November 18	 
 The Annotated Transformer.ipynb	November 20	November 20	 
 Copy of fine_tune_whisper.ipynb	November 18	November 18	 
 1_feature_groups.ipynb	November 17	July 19	 
 1_feature_groups.ipynb	November 17	September 2	 

[New notebook](#) Cancel

Share Settings J

Editing

Executed code history

You can use the Whisper model by Hugging Face

- A [sample Colab Notebook is available here](#).
- Here is a [blog post explaining the example code](#)
- You should fine-tune the model with either Swedish or your mother tongue.
https://huggingface.co/datasets/mozilla-foundation/common_voice_11_0/viewer/sv-SE/train
- We recommend that you train your model with a GPU. Colab provides free GPUs for 12 hours (then it shuts down) - so make sure to save your model weights before it shuts down. Getting a good GPU (e.g., p100) is getting harder on Colab. Alternatively, you could modal.com to train your GPU, but i think they will quickly use up your \$30 of free credit. Colab is free. If you have your own GPU, you can, of course, use that. You may need to reduce the number of training epochs or dataset size to train in time.

Communicate the value of your model with a UI (Gradio)

- Communicate the value of your model to stakeholders with an app/service that uses the ML model to make value-added decisions

Example UIs:

- Allow the user to speak into the microphone and transcribe what he/she says (lower grade, as this code is in the example code)
- Allow the user to paste in the URL to a video, and transcribe what is spoken in the video (higher grade)
- Your own creative idea for how to allow people to use your model (highest grade)

Task 2: Identify how to help improve model performance

1. Two of the ways in which you can improve model performance are using
 - (a) **model-centric approach** - e.g., tune hyperparameters, change the fine-tuning model architecture, etc
 - (b) **data-centric approach** - identify new data sources that enable you to train a better model than one provided in the blog post

Deliverables

- Deliver your source code as a Github Repository.
- Deliver your description for task 2 as a README.md file in the root of your Github repository
- Deliver a Hugging Face Spaces public URL for the UI for your speech transcription model.

Deadline midnight 9th December.