

# AI on NVIDIA Jetson Nano (Day 8)

# Outline

- Quick Start Guide: Colab
- Transfer Learning / Fine-tuning

# What is Colaboratory?

- Colaboratory, or “Colab” for short, allows you to write and execute Python in your browser
  - With zero configuration required
  - With free access to GPUs
  - With easy sharing
- Whether you’re a student, a data scientist or an AI researcher
- Let’s get started on the Colab
  - <https://colab.research.google.com/>

# Google Colab Pricing

<p>Colab</p> <p>Free</p> <p>Current plan</p>	<p>Recommended</p> <p>Colab Pro</p> <p>฿321.00 / month</p>	<p>Colab Pro+</p> <p>฿1,568.00 / month</p>
<ul style="list-style-type: none"><li>✓ No subscription required.</li></ul>	<ul style="list-style-type: none"><li>✓ <b>Faster GPUs</b> Access to faster GPUs and TPUs means you spend less time waiting while your code is running.</li><li>✓ <b>More memory</b> More RAM and more disk means more room for your data.</li><li>✓ <b>Longer runtimes</b> Longer running notebooks and fewer idle timeouts mean you disconnect less often.</li></ul>	<ul style="list-style-type: none"><li>✓ <b>Background execution</b> Notebooks keep working even after you close your browser.</li><li>✓ <b>Faster GPUs</b> Priority access to faster GPUs and TPUs means you spend less time waiting while your code is running.</li><li>✓ <b>Even more memory</b> Significantly more memory than ever before.</li><li>✓ <b>Even longer runtimes</b> Gives you the longest running notebooks in Colab so you are able to get your work done.</li></ul>

# Transfer Learning / Fine-Tuning

- Caltech 101 Dataset
  - Pictures of objects belonging to 101 categories, about 40 to 800 images per category.
  - Size: 131MB
  - [http://www.vision.caltech.edu/Image\\_Datasets/Caltech101/](http://www.vision.caltech.edu/Image_Datasets/Caltech101/)
- Fine-Tuning Model
  - ImageNet Dataset: More than 14 million images and 20,000 categories
    - 1,281,167 training images, 50,000 validation images and 100,000 test images
    - Size: 166.05GB
    - <https://www.image-net.org/update-mar-11-2021.php>
    - <https://www.kaggle.com/c/imagenet-object-localization-challenge/overview/description>
  - Using the pre-trained model VGG-19 as a feature extractor for transfer learning on the Caltech 101 dataset

# References / Useful Links

- What is Colaboratory?
  - [https://colab.research.google.com/notebooks/intro.ipynb?utm\\_source=scs-index](https://colab.research.google.com/notebooks/intro.ipynb?utm_source=scs-index)
- Introduction to Colab (Video)
  - <https://www.youtube.com/watch?v=inN8seMm7UI>
- Python Tutorial
  - <https://www.w3schools.com/python/default.asp>
- Very Deep Convolutional Networks for Large-Scale Image Recognition
  - <https://arxiv.org/abs/1409.1556>
- Popular Trained Image Classification Models for Keras
  - <https://github.com/fchollet/deep-learning-models>