



Módulo 7 – Fundamentos de Deep Learning

# Actividad: Transfer Learning - Cats & Dogs

Especialización en Ciencia de Datos

# Actividad: Transfer Learning Cats & Dogs



# Transfer Learning Cats & Dogs

En esta actividad, deberá implementar una red neuronal convolutiva utilizando un modelo pre-entrenado para el reconocimiento de imágenes de gatos y perros, utilizando el concepto de Fine Tuning.



# Transfer Learning Cats & Dogs

Para esto, debe utilizar el notebook jupyter provisto y seguir las instrucciones. Es importante que vaya comprendiendo los pasos que se van realizando. Al finalizar la experiencia, deberá confeccionar un entregable que lo describiremos a continuación.

The screenshot shows a Jupyter Notebook interface with the following details:

- Title Bar:** U3 - Transfer Learning - Cats and Dogs.ipynb
- Menu Bar:** Archivo, Editar, Ver, Insertar, Entorno de ejecución, Herramientas, Ayuda, Guardado por última vez: 20:25
- Toolbar:** Comentario, + Código, + Texto
- Table of Contents:**
  - Transfer Learning - Cats & Dogs
    - Copyright 2019 The TensorFlow Authors.
  - Transfer learning and fine-tuning
    - Data preprocessing
      - Data download
      - Configure the dataset for performance
      - Use data augmentation
      - Rescale pixel values
    - Create the base model from the pre-trained convnets
    - Feature extraction
      - Freeze the convolutional base
      - Important note about BatchNormalization layers
      - Add a classification head
- Content Area:**
  - Transfer Learning - Cats & Dogs**
    - Copyright 2019 The TensorFlow Authors.
  - Transfer learning and fine-tuning**

In this tutorial, you will learn how to classify images of cats and dogs by using transfer learning from a pre-trained network. A pre-trained model is a saved network that was previously trained on a large dataset, typically on a large-scale image-classification task. You either use the pretrained model as is or use transfer learning to customize this model to a given task. The intuition behind transfer learning for image classification is that if a model is trained on a large and general enough dataset, this model will effectively serve as a generic model of the visual world. You can then take advantage of these learned feature maps without having to start from scratch by training a large model on a large dataset.

In this notebook, you will try two ways to customize a pretrained model:

    1. Feature Extraction: Use the representations learned by a previous network to extract meaningful features from new samples. You simply add a new classifier, which will be trained from scratch, on top of the pretrained model so that you can repurpose the feature maps learned previously for the dataset.

# Instrucciones

- A. Deberá entregar el notebook resuelto con todos los pasos solicitados.
- B. Deberá entregar un informe, en formato Word, donde explique lo siguiente:
  - 1. ¿Qué es data augmentation?
  - 2. ¿Por qué se reescalaron los pixeles en el preprocessamiento?
  - 3. ¿En qué consiste el freeze y unfreeze de las capas del modelo?
  - 4. ¿En qué consiste la estrategia de entrenar un modelo base y después hacer fine tuning?
  - 5. ¿Por qué no se utilizó una capa softmax al agregar la capa de cabecera en el modelo base?
  - 6. Conclusiones.



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¡Éxito!