Practical Lab 1

Kaggle Image Recognition Challenges

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Kaggle Competitions

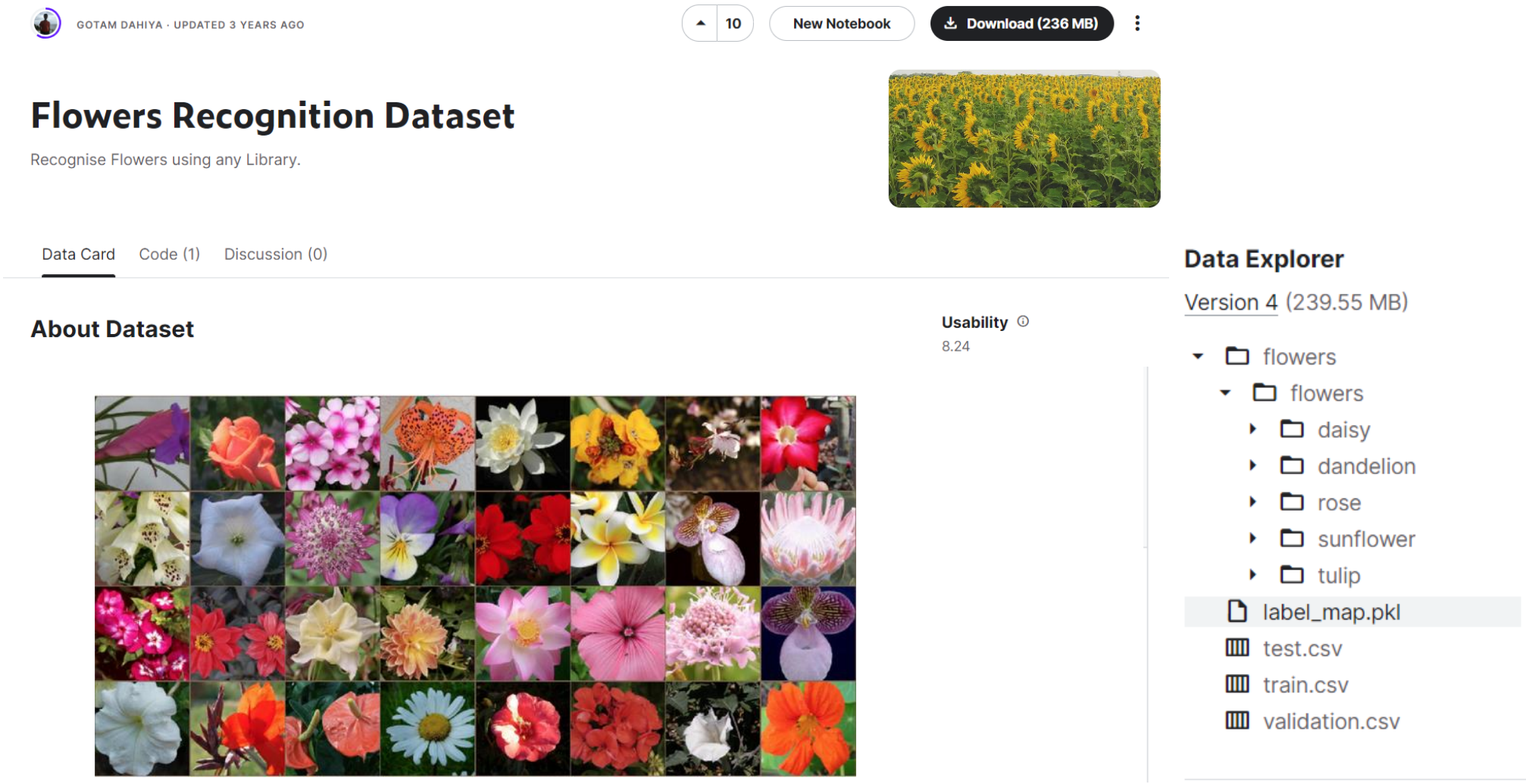
Background and Required notions

- **Before starting the practical lab, let us remind the principle of Convolutional Neural Networks, course and labs from the 2nd semester of BUT2**
  - Lecture 03: CNNs: Architecture
  - Lecture 04: CNNs: Transfer learning and Finetuning
  - Lab03: CNN training from scratch vs finetuning Guided version

All of them can be found in Moodle space of AL5.A.01 (https://moodle.univ-ubs.fr/course/view.php?id=9490)

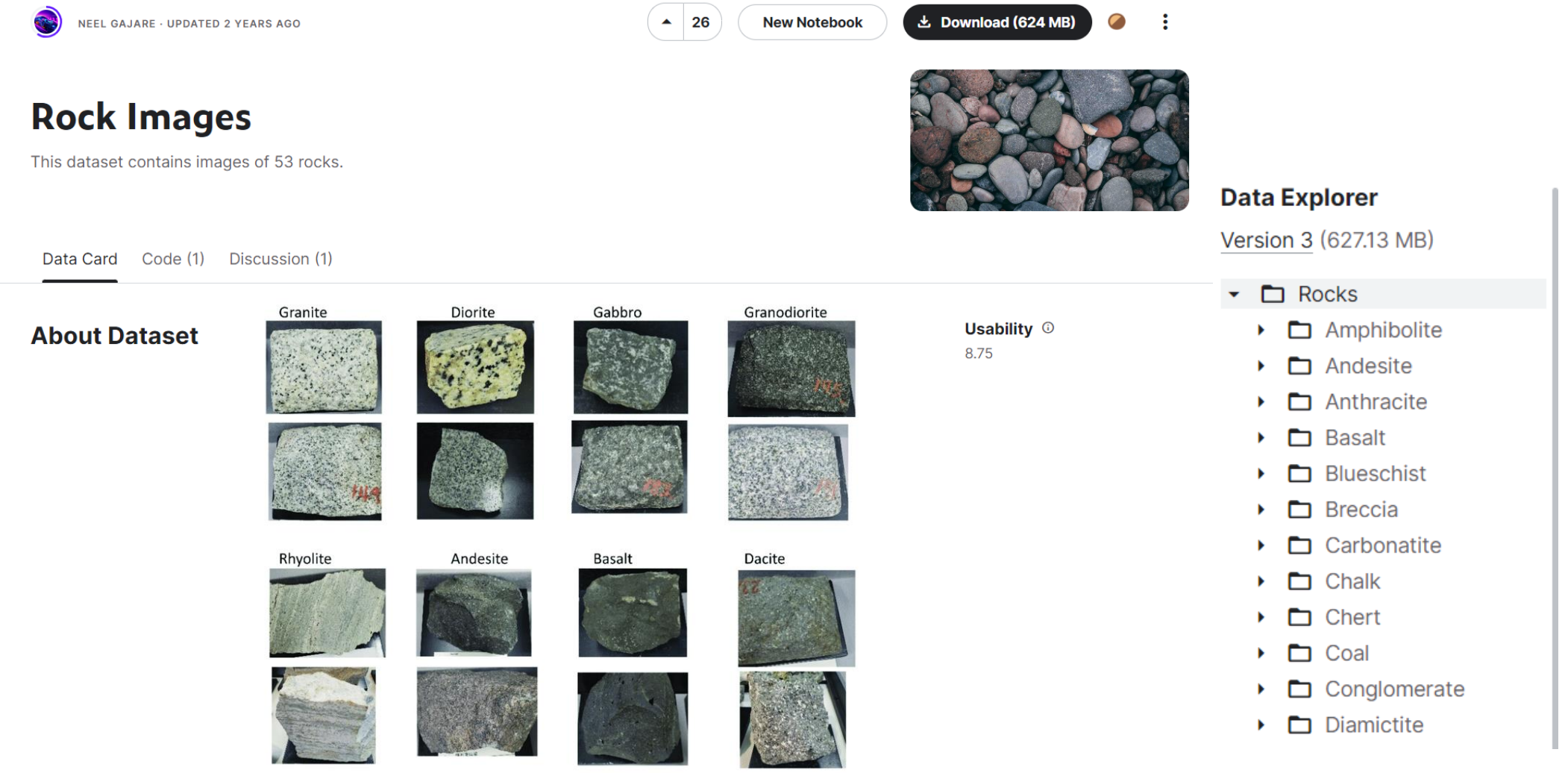
Kaggle Competitions - Examples

- **Flower recognition** : https://www.kaggle.com/datasets/apollo2506/flowers-recognition-dataset/data



Kaggle Competitions - Examples

- **Rock Recognition**: https://www.kaggle.com/datasets/neelgajare/rocks-dataset



Kaggle Competitions - Examples

- **Insect Recognition**: https://www.kaggle.com/datasets/kmldas/insect-identification-from-habitus-images

KAMAL DAS · UPDATED 3 YEARS AGO

35 | New Notebook | Download (3 GB)

Insect identification from habitus images

291 Insect specimen images

Data Card | Code (4) | Discussion (2)

About Dataset

Usability ⓘ
9.38

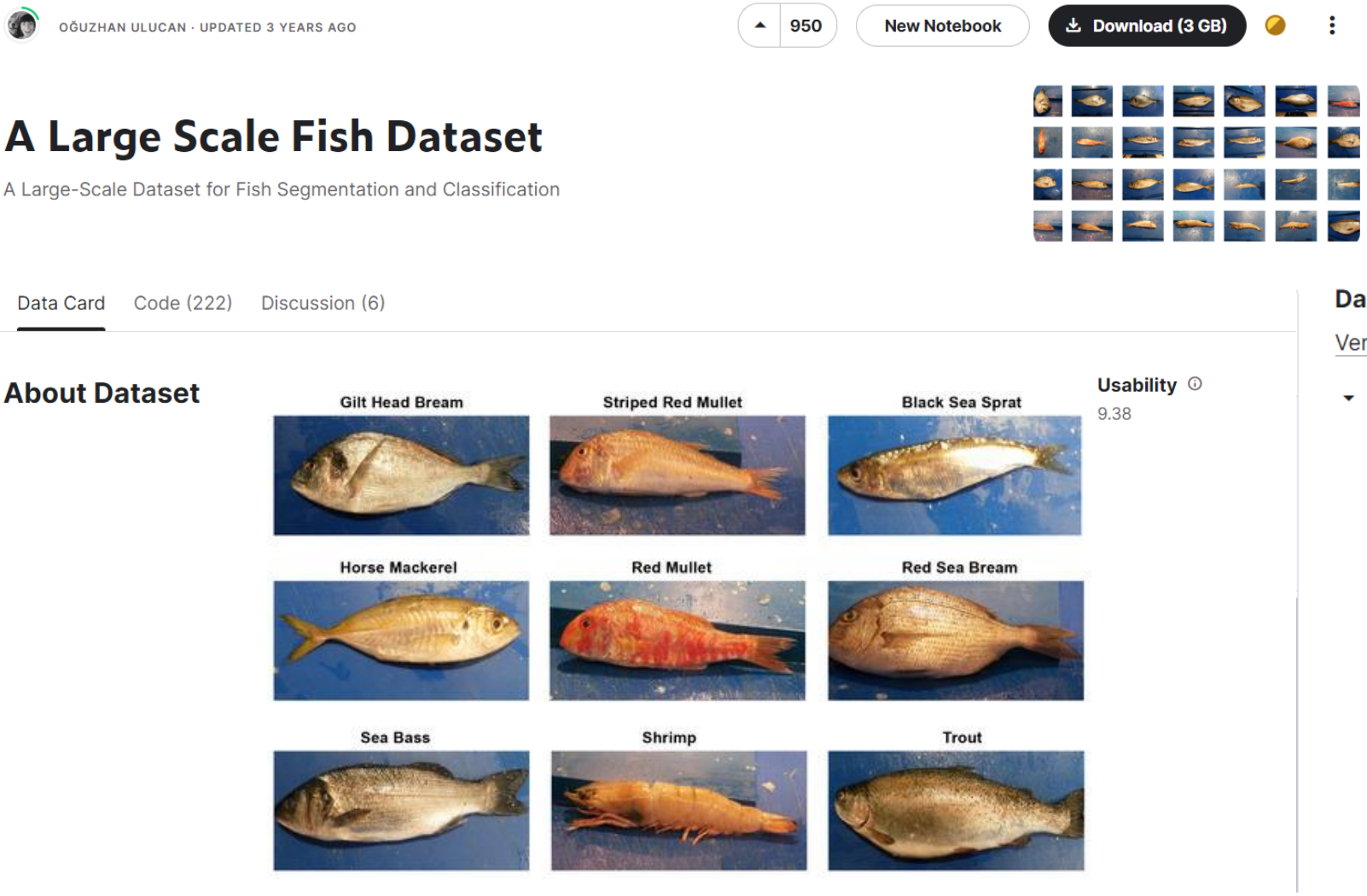
Data Explorer

Version 1 (2.55 GB)

- database
  - 1035167
  - 1035185
  - 1035194
  - 1035195
  - 1035204
  - 1035208
  - 1035231
  - 1035290
  - 1035366

Kaggle Competitions - Examples

- **Fish Recognition**: https://www.kaggle.com/datasets/crowww/a-large-scale-fish-dataset



Kaggle Competitions - Examples

- **Land-use Classification**: https://www.kaggle.com/datasets/apollo2506/landuse-scene-classification/data

GOTAM DAHIYA · UPDATED 3 YEARS AGO

45 | New Notebook | Download (2 GB)

Land-Use Scene Classification

Use for classifying land scenes in Landsat Images

Data Card | Code (25) | Discussion (2)

About Dataset

Usability ⓘ
8.82

Data Explorer

Version 3 (2.13 GB)

- images
- images_train_test_val
  - test
  - train
  - validation
- label_map.json
- readme.txt
- test.csv
- train.csv
- validation.csv

Kaggle Competitions

General rules

- **Image data are provided with Train, Valid, Test splits** *(folders or .csv files)*
  - Train + valid sets are provided with labels, used for training and validation
  - Test set is provided without labels. Competitors should predict classes labels then submit their prediction to a server for evaluation

- **Image data provided without splits**
  - Generally we randomly split into train/vali (80/20 for example) to train our model
  - When test images are given, we perform prediction and submit the results

Lab assignment

Practical lab1: Comparing training from scratch vs transfer learning on Kaggle datasets

- Based on R413_Lab3, create a jupyter notebook file named **AL5A01_Lab1** and work in pairs (binômes)
- You have to choose one of the two following datasets (already downloaded and split into Train/Valid)
  - **Insect dataset:** https://drive.google.com/drive/folders/1-grJmceDqCL9mymbe_uPlQndu40BUasr?usp=sharing
  - **Land-use dataset:** https://drive.google.com/drive/folders/1Up6TYjS3-OAzxigoVG_XRSLef6prfUqq?usp=sharing
- You need to perform and compare 2 following tasks:
  - **Task 1: CNN from Scratch**
  - **Task 2: Finetuning from existing models**
- All models should be trained with 20 epochs !
- The performance of each task (on validation set) will be reported for competition (with other pairs) !!!
- All remarks, comments, illustrations of results for analysis will be considered for evaluation !

REF: https://pytorch.org/tutorials/beginner/transfer_learning_tutorial.html

References and Sources

- **Convolutional neural networks for visual recognition** - Stanford

  https://cs231n.github.io/

- **Neural networks and deep learning** (free online book)

  http://neuralnetworksanddeeplearning.com/index.html

- **Machine learning course** – Oxford

  https://www.cs.ox.ac.uk/people/nando.defreitas/machinelearning/

- **Neural network course -** Hugo Larochelle

  https://info.usherbrooke.ca/hlarochelle/neural_networks/content.html

- **Deep learning course** – François Fleuret

  https://fleuret.org/dlc/