



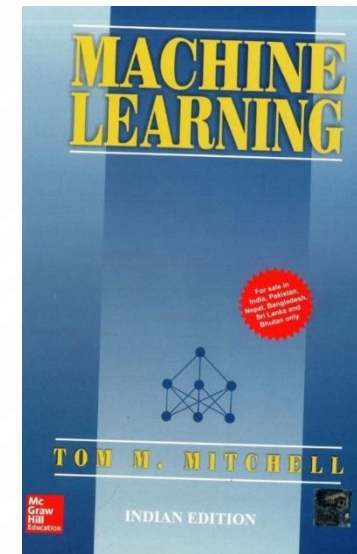
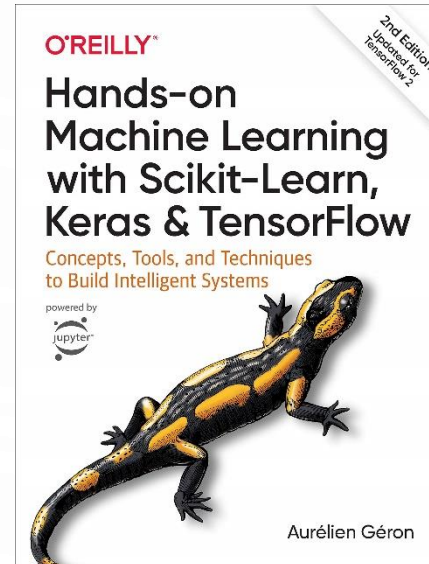
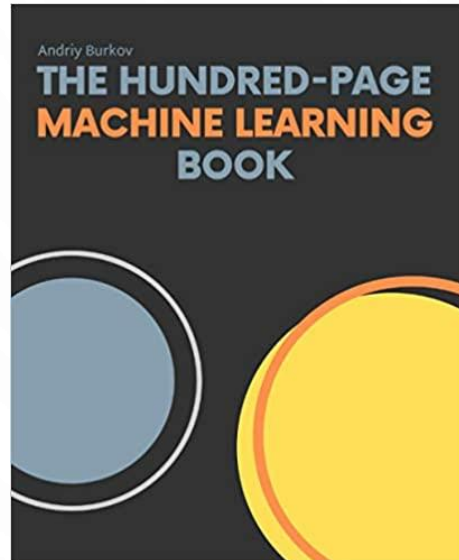
CSC 462 – Machine Learning

DR. SULTAN ALFARHOOD

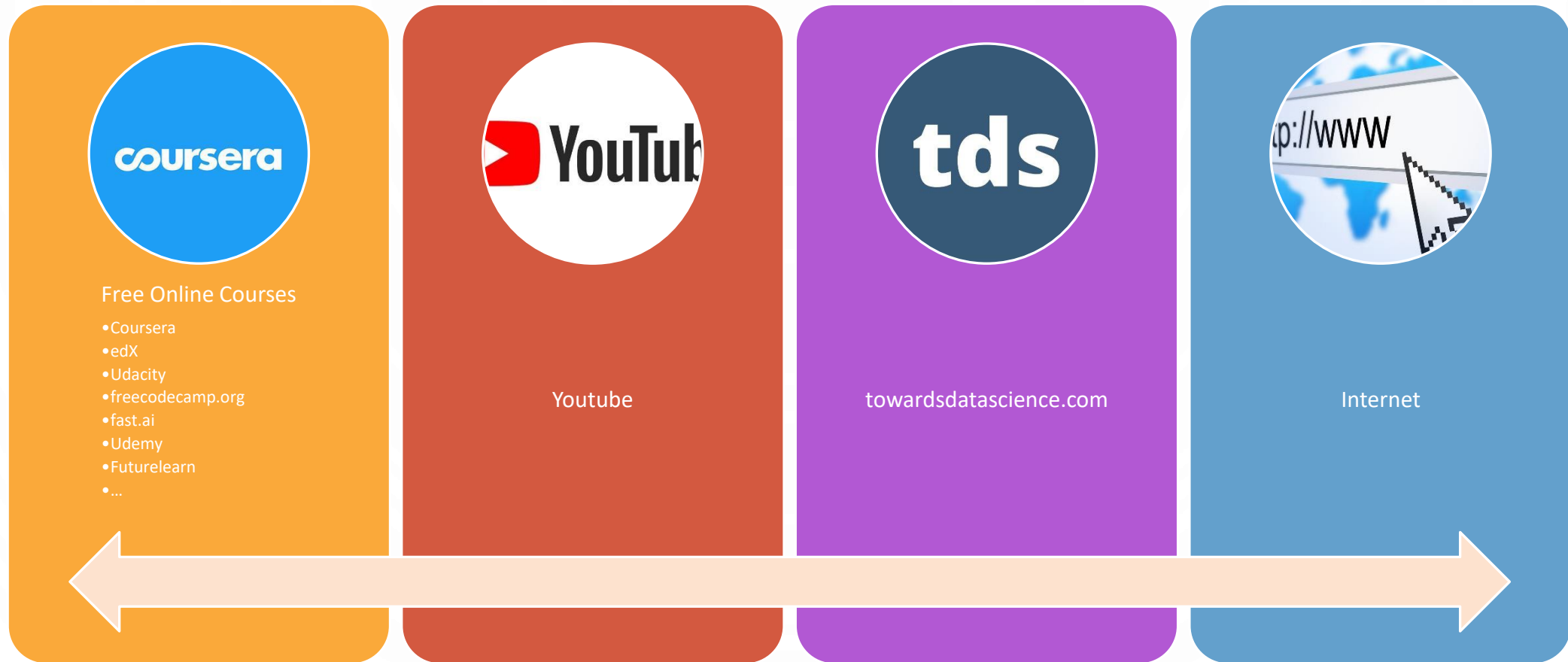
FALL 2024

Textbook

- **The Hundred-Page Machine Learning Book by Andriy Burkov.**
- Hands-on Machine Learning with Scikit-Learn, Keras, and TensorFlow by Aurélien Géron
- Machine Learning, Last edition, by Tom M. Mitchell. McGraw Hill.



Resources



Plan

Chapter #	Topic
1	Introduction to machine learning
2	Notation and Definitions
3	Ch3: Fundamental Algorithms (Linear Regression, Logistic Regression, Decision Tree Learning, Support Vector Machine, k-Nearest Neighbors)
4	Anatomy of a Learning Algorithm
5	Basic Practice (Feature Engineering, Learning Algorithm Selection, Datasets, Underfitting and Overfitting, Model Performance Assessment, Hyperparameter Tuning)
6	Neural Networks and Deep Learning
7	Problems and Solutions (Multiclass Classification, One-Class Classification, Multi-Label Classification, Ensemble Learning)
8	Advanced Practice (Imbalanced Datasets, Combining Models, Multiple Outputs, Transfer Learning, Working With Text in ML, Large Language Model (LLM), AutoML, Cloud Computing ML Services)
9	Unsupervised Learning (Clustering, PCA)

Assessment Methods

Homework & Participation	20%
Course Project	10%
Midterm Exam	30%
Final Exam	40%

Fill the Survey

- <https://forms.gle/KmEmKYUuQqazft2PA>



Optional Bonus Activity

- Complete one of these online Specializations (In this semester)
 - You must complete all the courses in the specialization
- **Extra 2 credits**
- Proof of completion including a quiz will be required to earn the extra credits
- **Deadline: 30 November 2024**

Deep Learning Specialization

- <https://www.coursera.org/specializations/deep-learning>

Generative Adversarial Networks (GANs) Specialization

- <https://www.coursera.org/specializations/generative-adversarial-networks-gans>

TensorFlow: Advanced Techniques Specialization

- <https://www.coursera.org/specializations/tensorflow-advanced-techniques>

Schedule

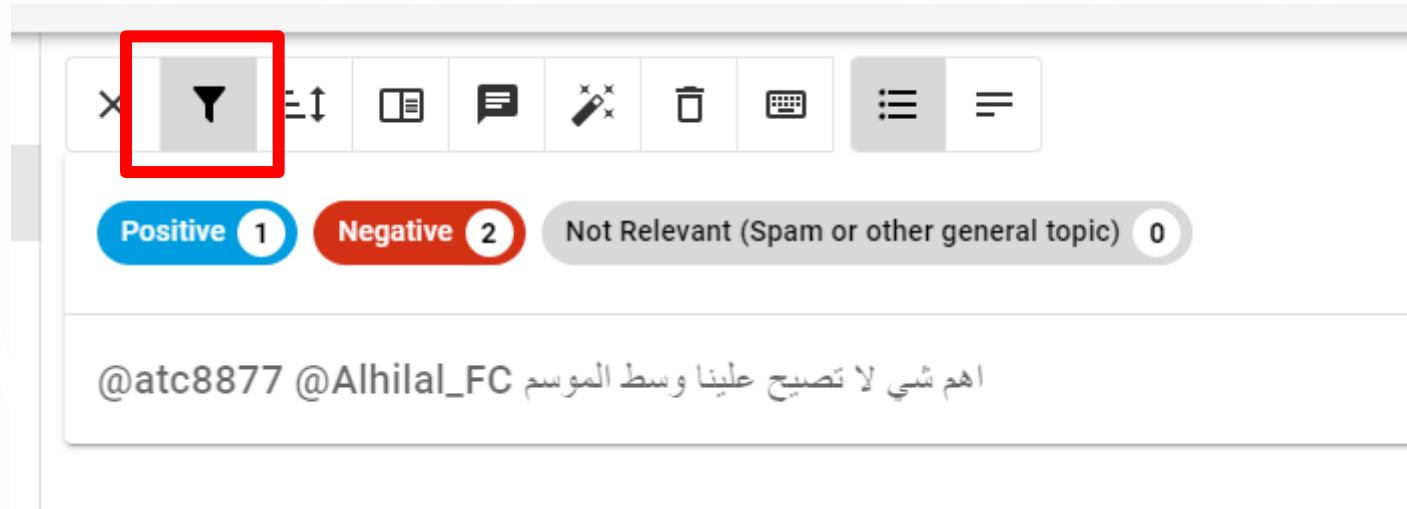
<https://docs.google.com/spreadsheets/d/15g5KNijp0y0LH3RfIRDgy19Zw6p9pRgSMfbe-E5qPv8>

Homework 1

- **Firstly**, read Chapter 1 of the “The Hundred-Page Machine Learning Book” and summarize it.
 - The summary must be two pages maximum.
 - Submit the summary as a **PDF** file in the LMS.
- **Secondly**, you are responsible to annotate different types of data:
 - **Task 1:** label Tweets into corresponding classes (Positive, Negative, Not Relevant)
 - **Task 2:** annotate images containing camels to detect them.
- **Deadline:** 31 August 2024 (6pm)

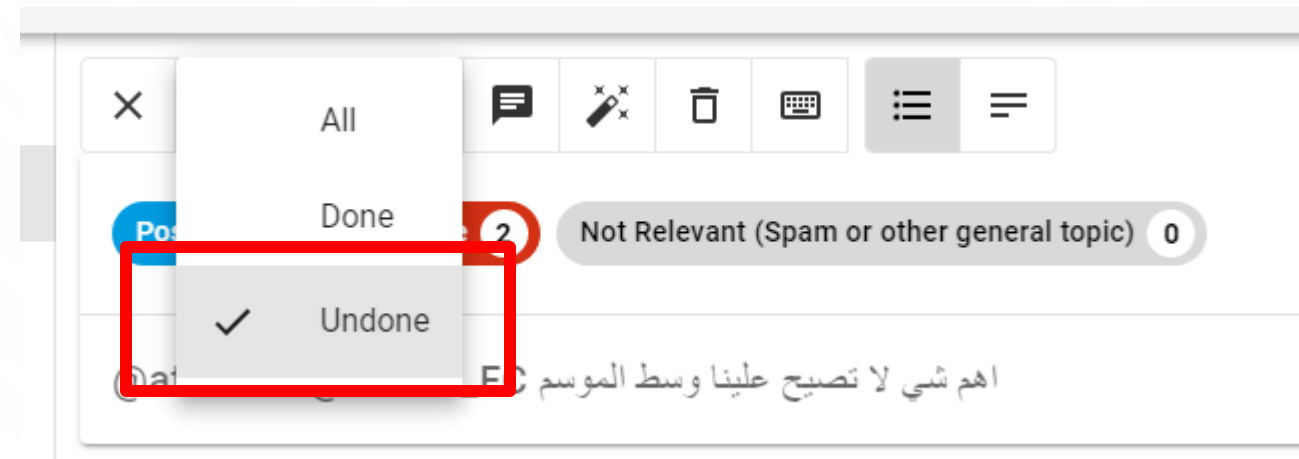
1. Open the data annotation tool. Use any of these links:
 - www.crowdata.us
2. Login to the site
 - Username: Your University ID #
 - Password: the password you chose in the survey (consist of 10 digits)
3. Choose the Task (Task 1 or Task 2)
4. Press “Start Annotation”
5. Annotate only samples with “In progress” status. You need to complete the annotations for both tasks per the following:
 - Task 1: 200 tweets
 - Task 2: 20 images

1



Task 1 Example

2



Task 1 Example

The image displays three sequential screenshots of a 'Tweets Labelling' web application interface, illustrating the workflow for labeling a tweet.

Screenshot 1 (Top): Shows the 'Tweets Labelling' header, a 'Start Annotation' button, and a sidebar with 'Home' and 'Dataset' options. A red box labeled '3' highlights the 'Positive' label button (marked with a checkmark and '1'). Other label buttons include 'Negative' (marked '2') and 'Not Relevant (Spam or other general topic)' (marked '0'). The tweet text is '@AlNassrFC @Alfaihaclub نادي الأخلاق و الروح الرياضية'.

Screenshot 2 (Middle): Shows the same interface, but the 'Positive' label button is now selected, indicated by a checkmark icon inside a red box labeled '4'. The counts for labels remain 'Positive 1', 'Negative 2', and 'Not Relevant 0'.

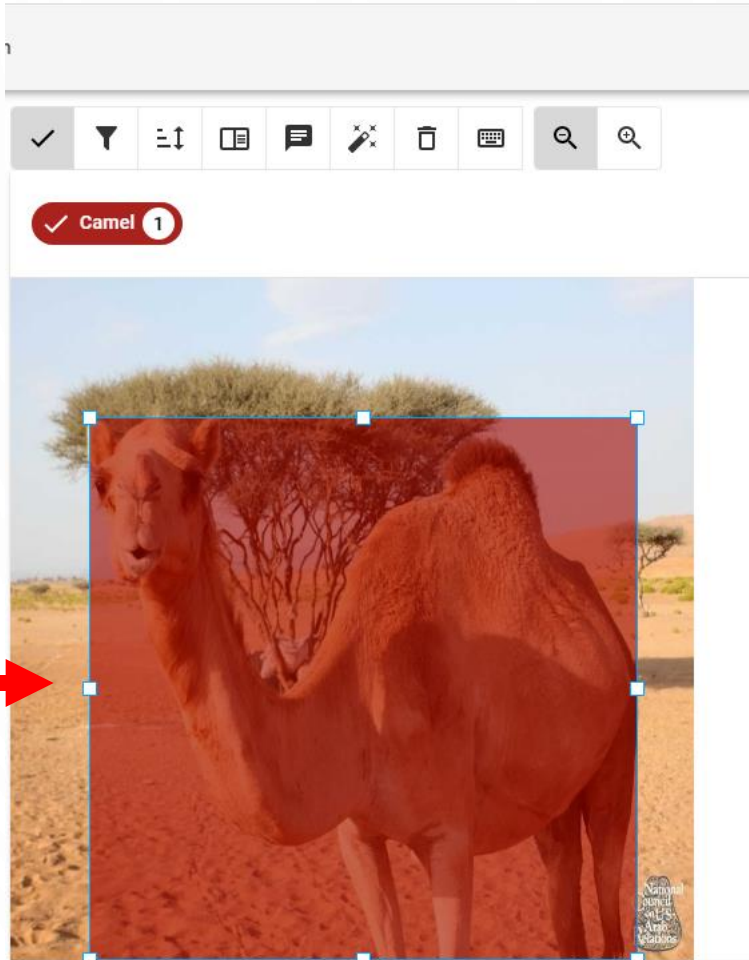
Screenshot 3 (Bottom): Shows the 'Progress' section on the right side of the interface. A red box labeled '5' highlights the progress indicator, which shows '10 of 50000' items, navigation arrows, and a progress bar indicating '1%' completion. Below the progress bar, a table with 'Key' and 'Value' headers is visible.

Key	Value
Total	50000
Complete	1

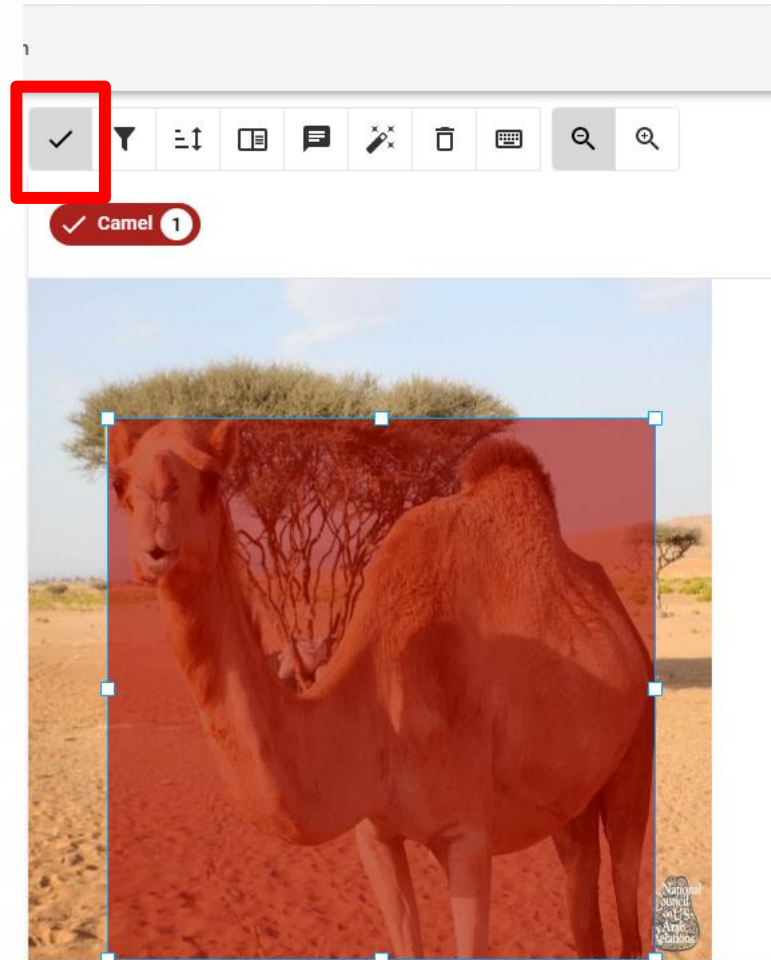
Task 2 Example

1 & 2 steps are similar to Task 1

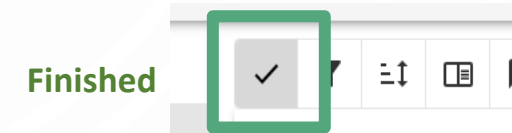
3 →



4



Annotate only samples with “In progress” status



Note: do not annotate samples with “Finished” status. Make sure that the sample is unchecked: