CSC 462 – Machine Learning

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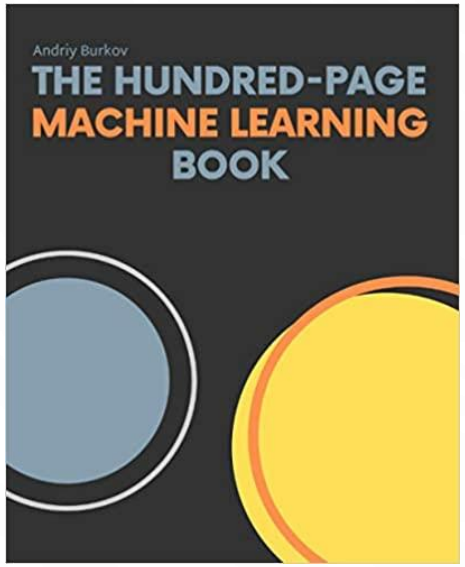
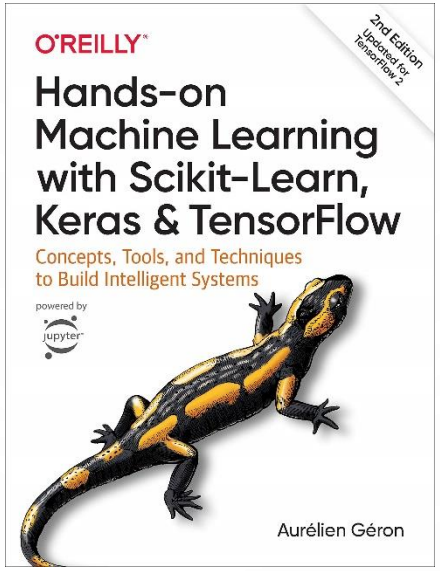
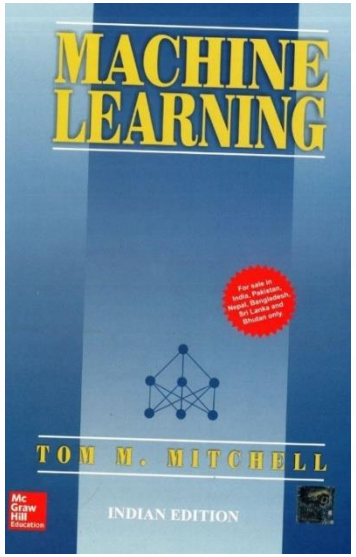
FALL 2024

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

Free Online Courses

- Coursera
- edX
- Udacity
- freecodecamp.org
- fast.ai
- Udemy
- Futurelearn
- …

Youtube

towardsdatascience.com

Internet

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/141o39F9rc7CVDq9wPfdkLSsPOqG-ohx-

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.

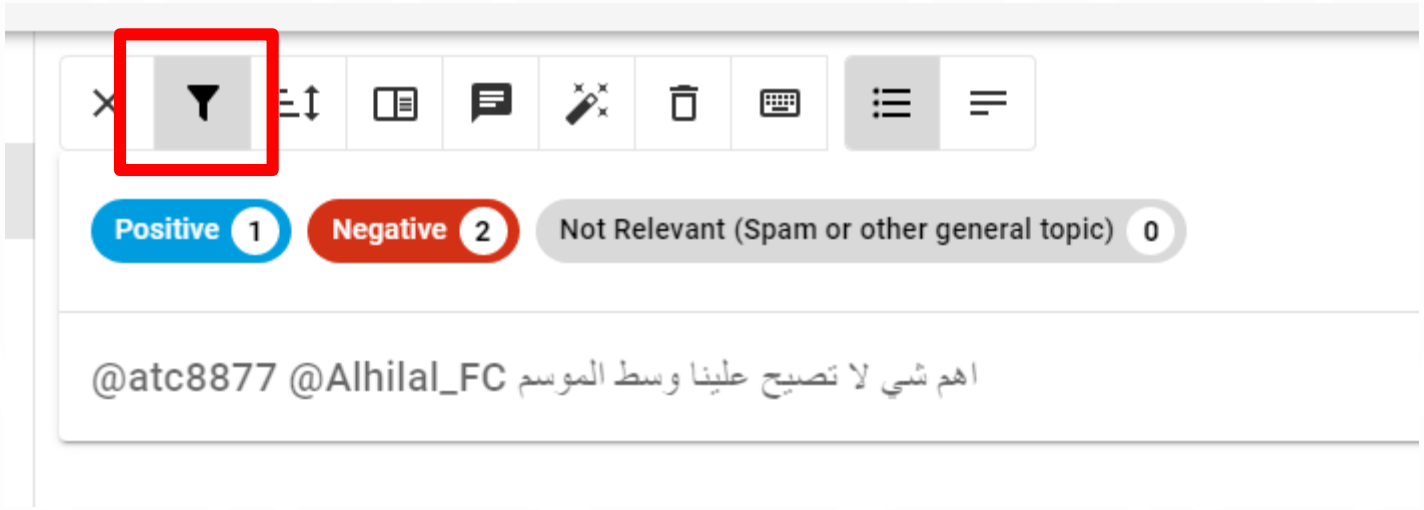
- **Secondly**, you are responsible to annotate different types of data:
  - **Task 1:** label Tweets into corresponding classes (Positive, Negative, Not Relevant)
  - **Task 2:** annotate images containing camels to detect them.

- **Deadline:** 31 August 2024 (6pm)

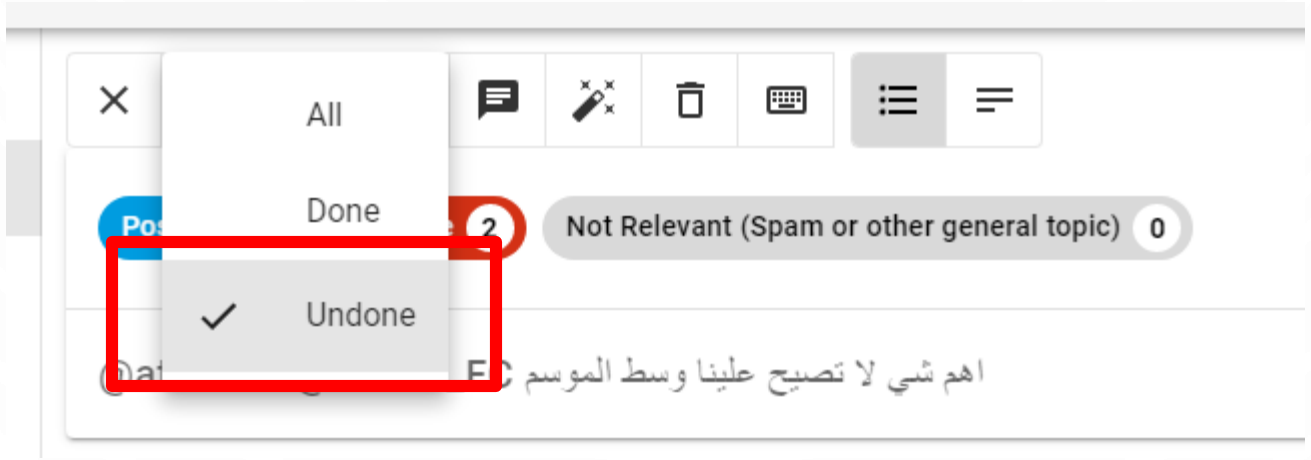
1. Open the data annotation tool. Use any of these links:
   - www.crowdata.us
2. Login to the site
   - Username: Your University ID #
   - Password: the password you chose in the survey (consist of 10 digits)
3. Choose the Task (Task 1 or Task 2)
4. Press "Start Annotation"
5. Annotate only samples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

Task 1 Example

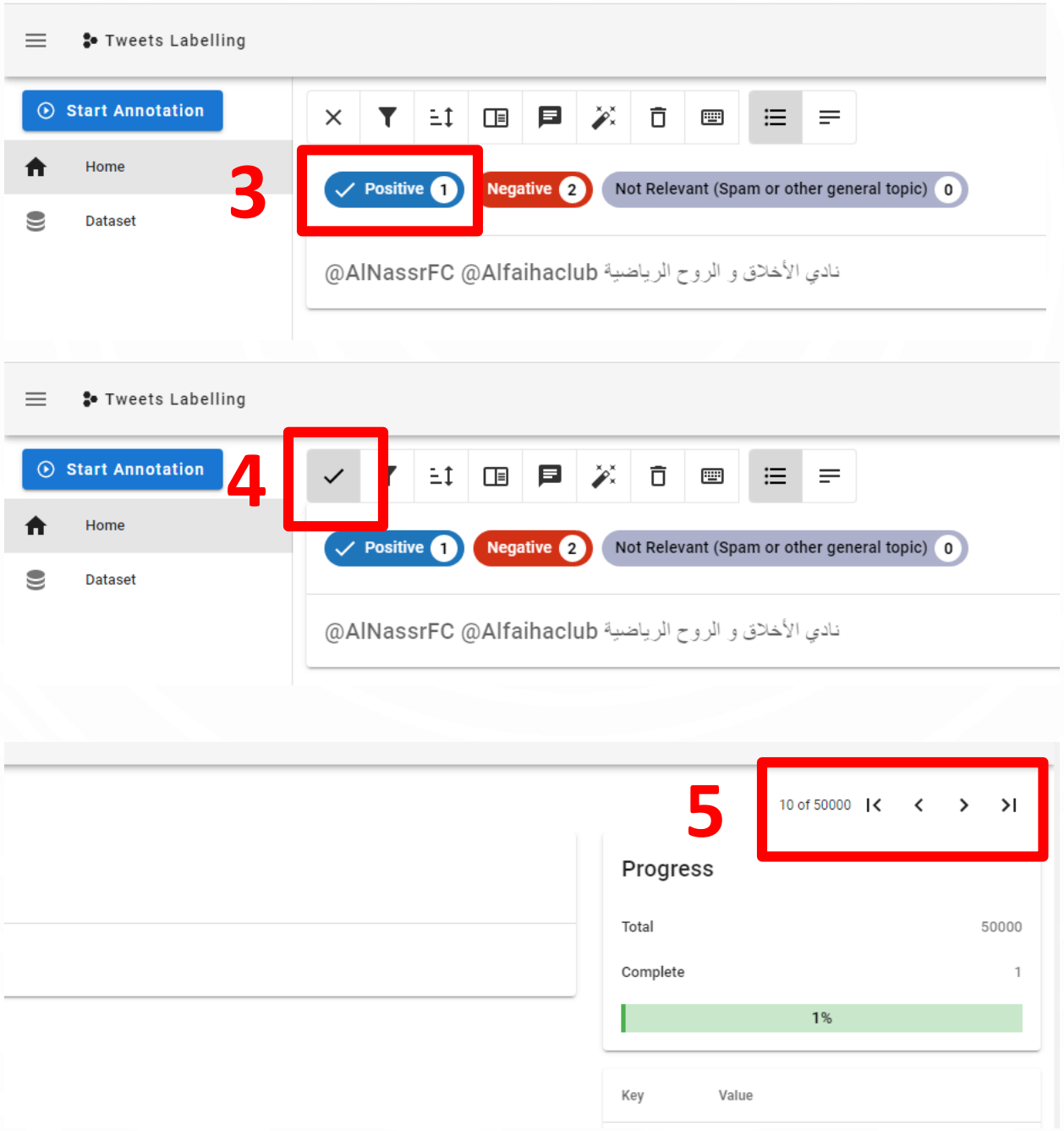
1



2

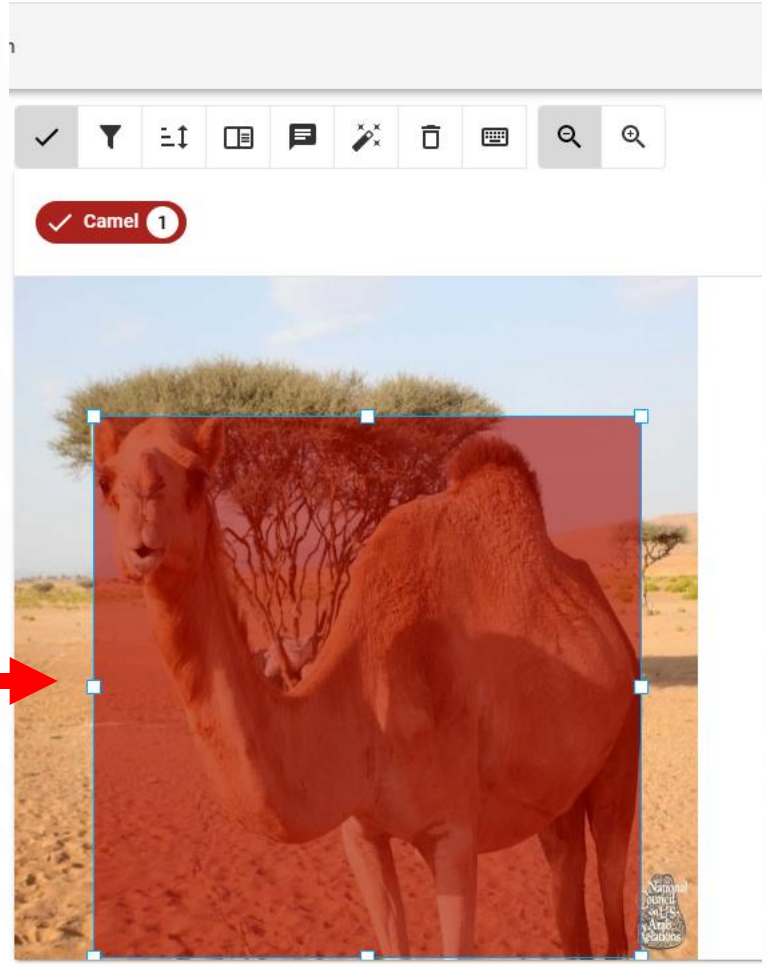


Task 1 Example

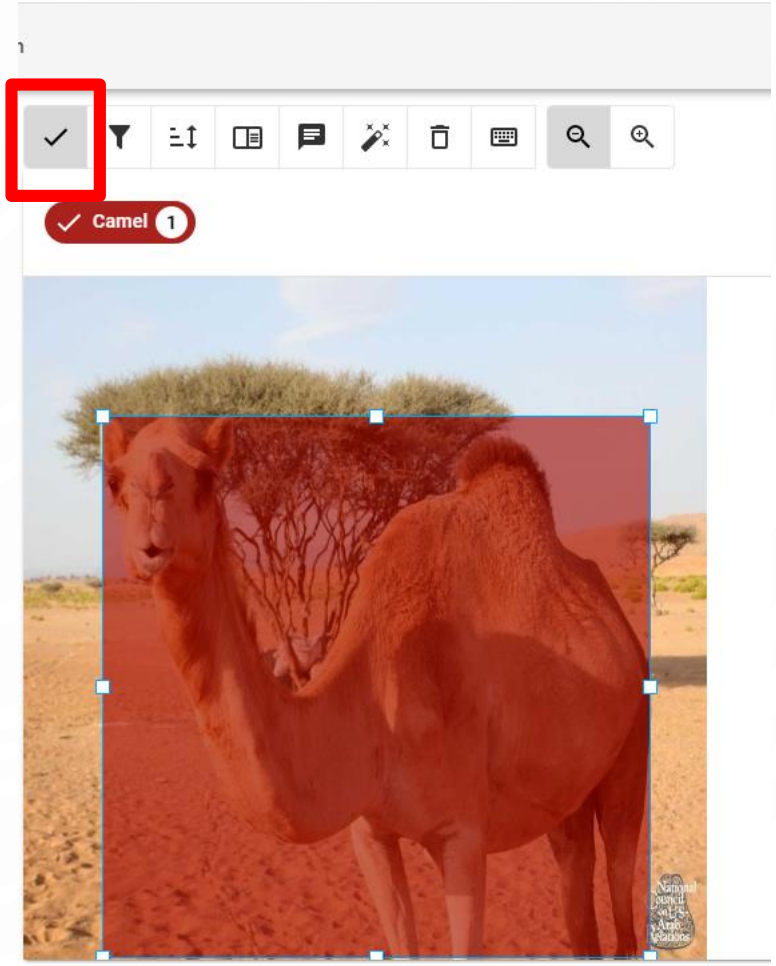


Task 2 Example

1 & 2 steps are similar to Task 1

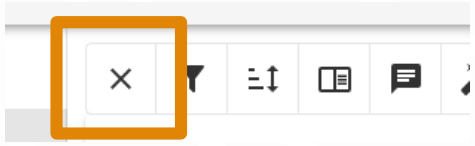


3



Annotate only samples with “In progress” status

In progress



Finished

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