

A decorative graphic on the left side of the slide consists of a network of thin, dark blue lines. These lines branch out and connect to small, empty circles, resembling a circuit board or a neural network diagram. The lines and circles are arranged in a way that they seem to flow from the top left towards the bottom right, with some lines extending further down the page.

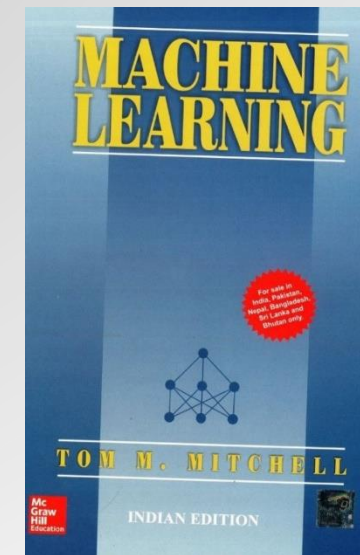
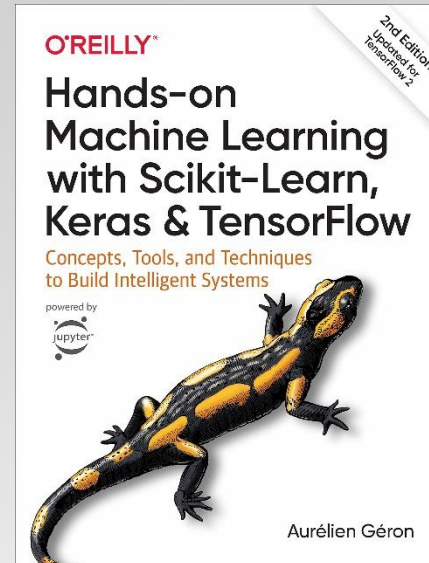
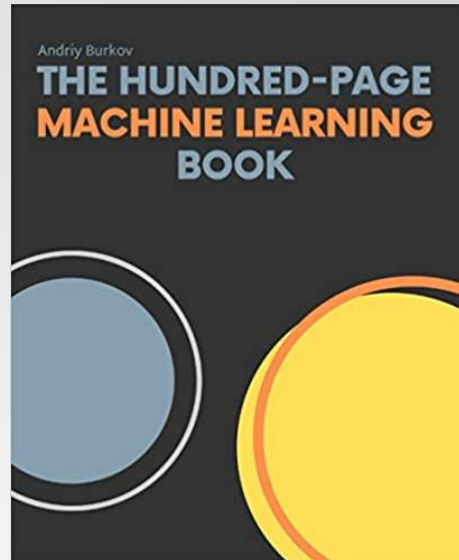
CSC 462 – Machine Learning

DR. SULTAN ALFARHOOD

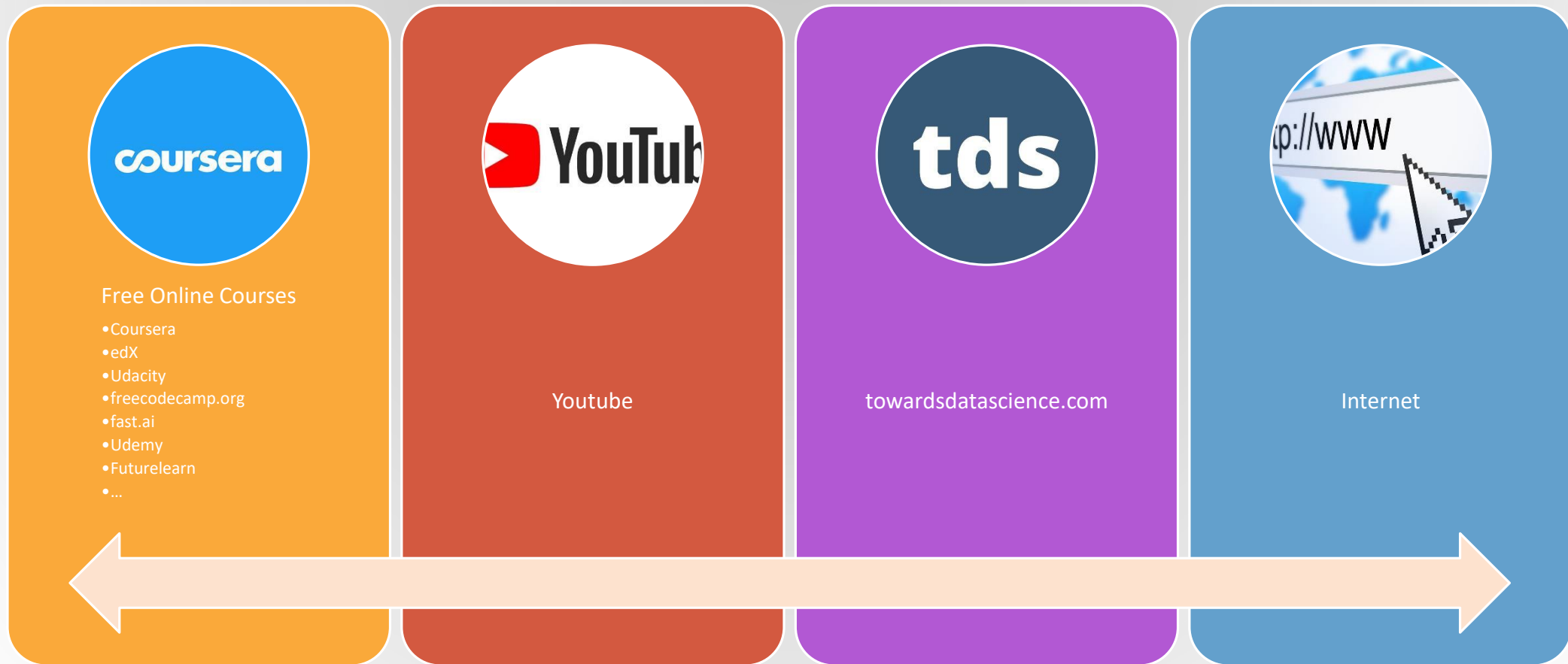
SPRING 2024

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

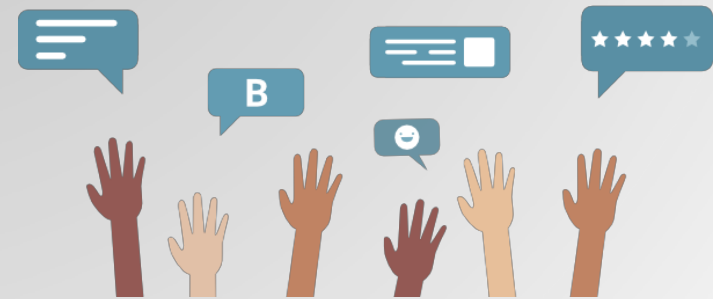
Chapter #	Topic
1	Introduction to machine learning
2	Notation and Definitions
3	Ch3: Fundamental Algorithms (Linear Regression, Logistic Regression, Decision Tree Learning, Support Vector Machine, k-Nearest Neighbors)
4	Anatomy of a Learning Algorithm
5	Basic Practice (Feature Engineering, Learning Algorithm 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/XKB31EgagdUEjDJy7>



Optional Bonus Activity

- Complete one of these online courses (In this semester)
- **Extra 2 credits**
- Proof of completion including a quiz will be required to earn the extra credits
- **Deadline: 5 May 2024**

Intro to TensorFlow for Deep Learning

- <https://www.udacity.com/course/intro-to-tensorflow-for-deep-learning--ud187>

Introduction to TensorFlow for Artificial Intelligence, Machine Learning, and Deep Learning

- <https://www.coursera.org/learn/introduction-tensorflow>

Convolutional Neural Networks in TensorFlow

- <https://www.coursera.org/learn/convolutional-neural-networks-tensorflow>

Natural Language Processing in TensorFlow

- <https://www.coursera.org/learn/natural-language-processing-tensorflow>

TensorFlow Developer Certificate

- Demonstrate your proficiency in using TensorFlow to solve deep learning and ML problems. Get recognized for your skills and join [Google Certificate Network](#).
- TensorFlow Developer Certificate program overview
 - Exam (\$100 USD)



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Find TensorFlow Developers who have passed the certification exam to help you with your machine learning and deep learning tasks. This level one certificate exam tests a developer's foundational knowledge of integrating machine learning into tools and applications. The certificate program requires an understanding of building TensorFlow models using Computer Vision, Convolutional Neural Networks, Natural Language Processing, and real-world image data and strategies. You can learn more about this certificate program on our [website](#).

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Name	Location	Experience	Grant date	Expiration date
Tamim Shaban	Saudi Arabia	2-5 years	9/26/2021	9/26/2024
Omar Alarjeh	Saudi Arabia	2-5 years	7/10/2021	7/10/2024
William Alshaban	Saudi Arabia	2-5 years	6/7/2021	6/7/2024
Yousef Alshabli	Saudi Arabia	< 1 year	7/27/2022	7/27/2025
Muhammad Ahmed	Saudi Arabia	2-5 years	12/16/2022	12/16/2025
Yazied Alhamay	Saudi Arabia	2-5 years	12/31/2022	12/31/2025
Alwaleed Alshaban	Saudi Arabia	2-5 years	3/30/2023	3/30/2026
ABDULAZIZ ALSWARI	Saudi Arabia	< 1 year	5/19/2023	5/19/2026
Khalid Althargan	Saudi Arabia	1-2 years	5/23/2023	5/23/2026
Ahmed Alshabagh	Saudi Arabia	< 1 year	5/27/2023	5/27/2026
Hussam Zaid	Saudi Arabia	< 1 year	5/27/2023	5/27/2026
Ahmed Basha Alshawa	Saudi Arabia	< 1 year	6/7/2023	6/7/2026

<https://developers.google.com/certification/directory/tensorflow>

DeepLearning.AI TensorFlow Developer Professional Certificate

Professional Certificate - 4 course series

TensorFlow is one of the most in-demand and popular open-source deep learning frameworks available today. The DeepLearning.AI TensorFlow Developer Professional Certificate program teaches you applied machine learning skills with TensorFlow so you can build and train powerful models.

[Read more](#)

Introduction to TensorFlow for Artificial Intelligence, Machine Learning, and Deep Learning

Course 1 • 18 hours • 4.8 ★ (19,088 ratings)

Convolutional Neural Networks in TensorFlow

Course 2 • 16 hours • 4.7 ★ (7,982 ratings)

Natural Language Processing in TensorFlow

Course 3 • 24 hours • 4.6 ★ (6,354 ratings)

Sequences, Time Series and Prediction

Course 4 • 22 hours • 4.7 ★ (4,928 ratings)

<https://www.coursera.org/professional-certificates/tensorflow-in-practice>



Schedule

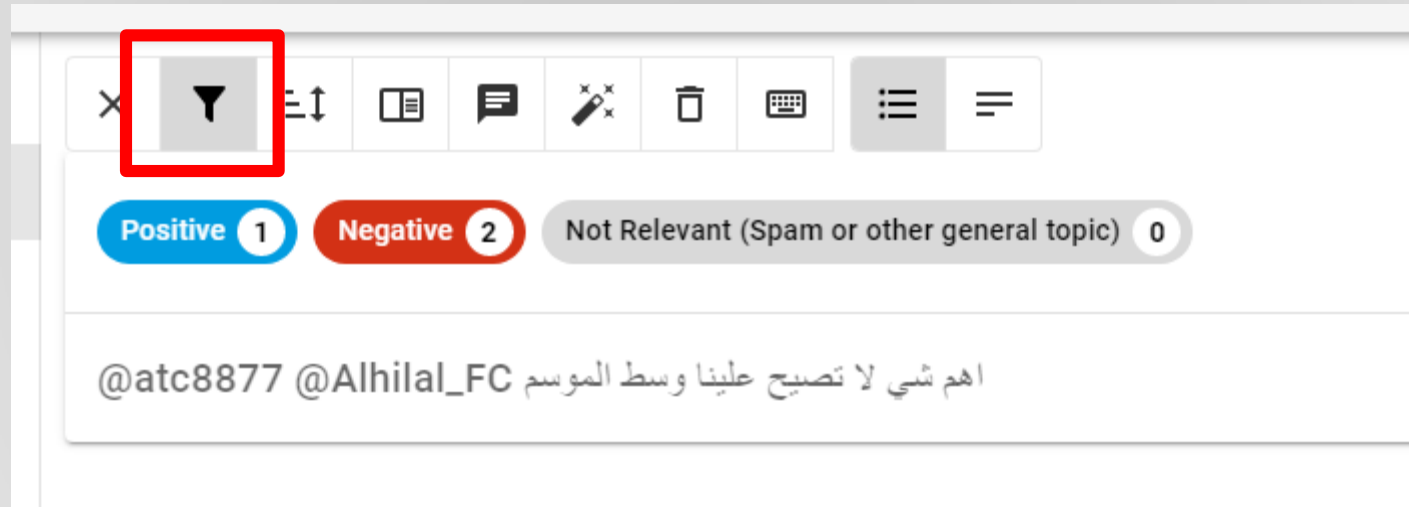
<https://docs.google.com/spreadsheets/d/1EkeVviH6NWVfQlOLBUOiWk54jxpgQUGL>

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:** 11 February 2024 (8am)

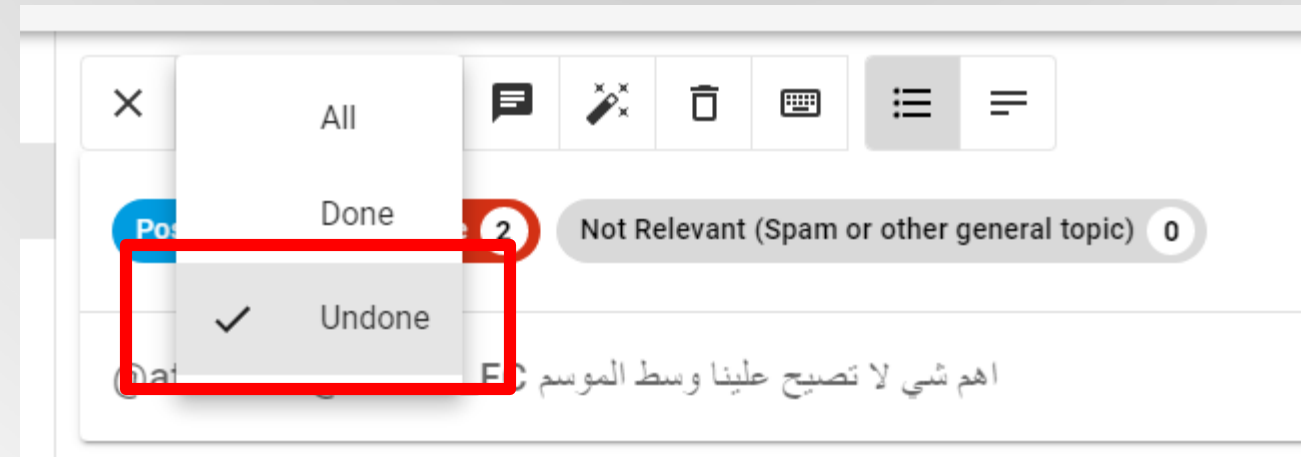
1. Open the data annotation tool. Use any of these links:
 - www.crowdata.us
2. Login to the site
 - Username: Your University ID #
 - Password: the password you chose in the survey (consist of 10 digits)
3. Choose the Task (Task 1 or Task 2)
4. Press “Start Annotation”
5. Annotate only samples with “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

Tweets Labelling

3 Start Annotation

Home Dataset

Positive 1 Negative 2 Not Relevant (Spam or other general topic) 0

@AlNassrFC @Alfaihaclub نادي الأخلاق و الروح الرياضية

4 ✓

Positive 1 Negative 2 Not Relevant (Spam or other general topic) 0

@AlNassrFC @Alfaihaclub نادي الأخلاق و الروح الرياضية

5 10 of 50000 |< < > >|

Progress

Total	50000
Complete	1

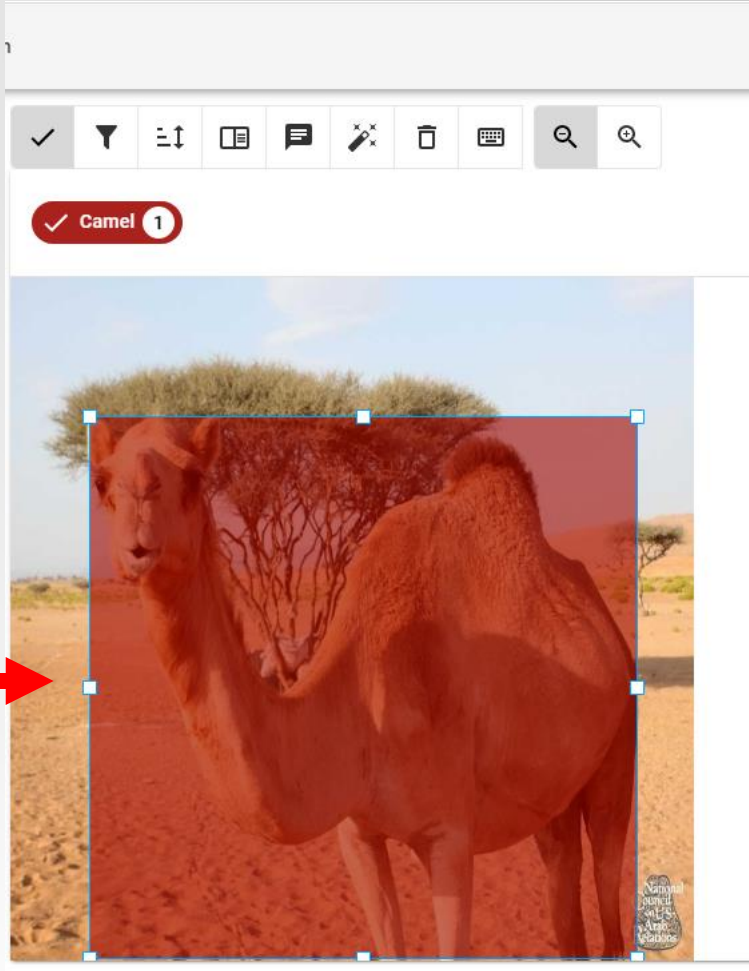
1%

Key	Value
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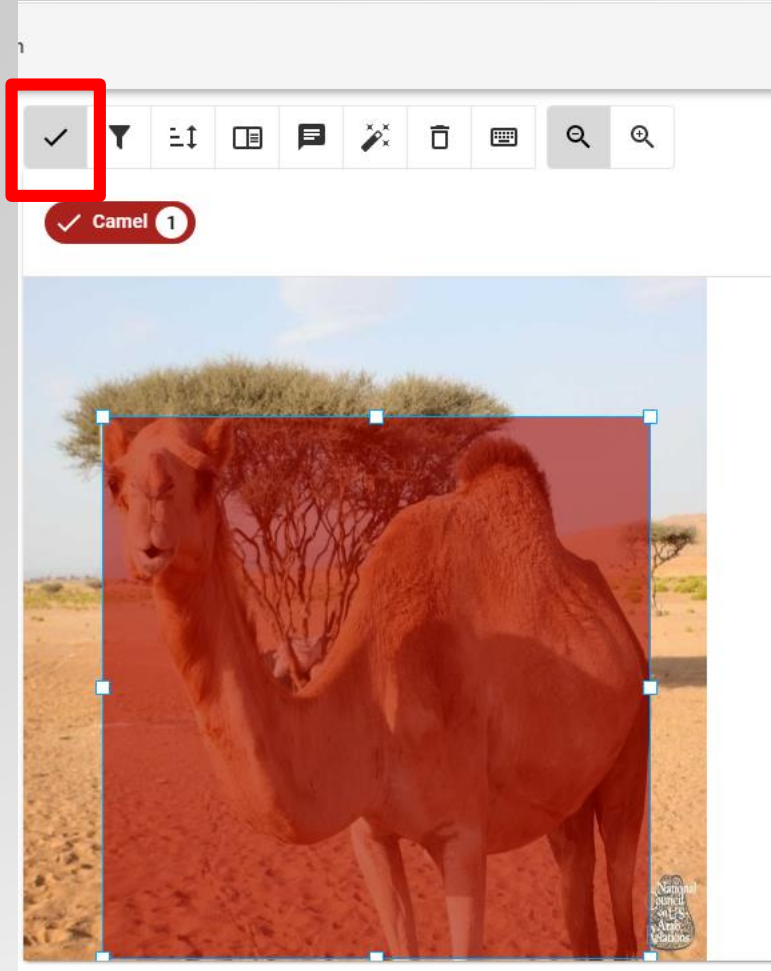
Task 2 Example

1 & 2 steps are similar to Task 1

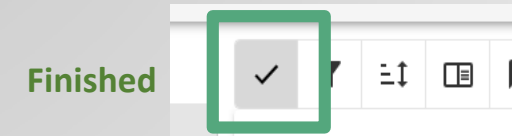
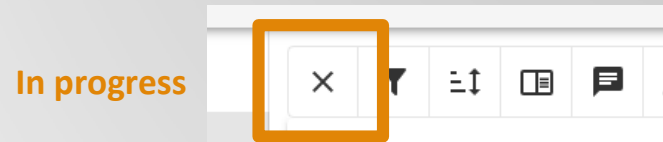
3



4



Annotate only samples with “In progress” status



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