



Interacting with Machine Learning

Animadex



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Summary

1 Scenario

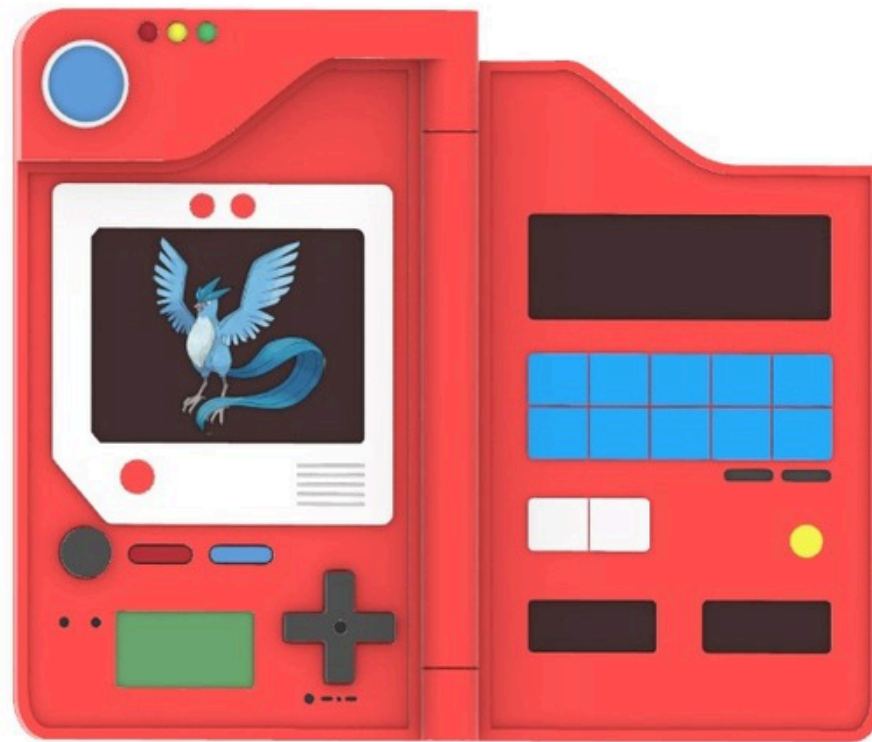
2 Design

3 Implementation

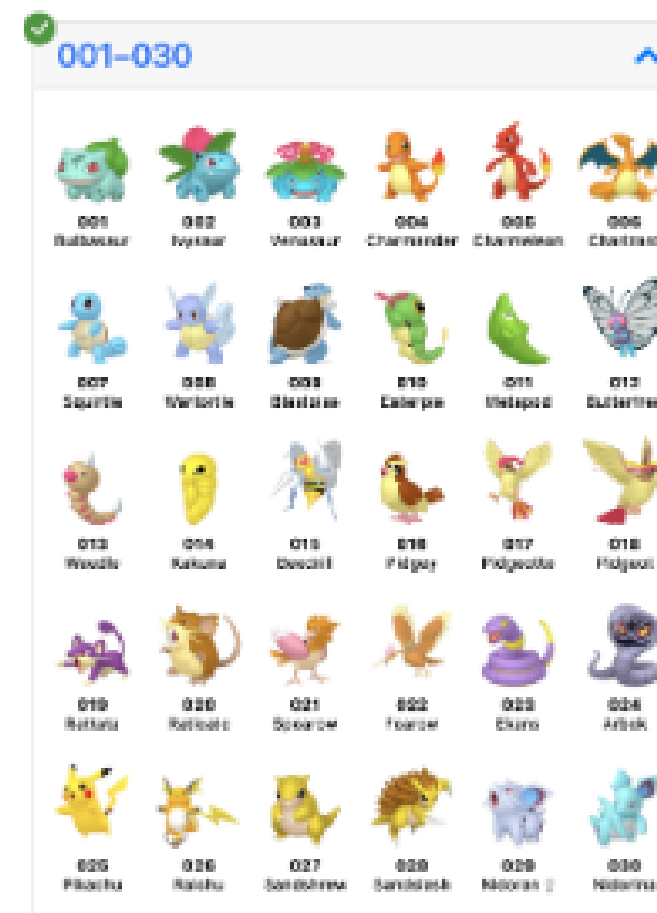
4 Evaluation



Concept idea



Pokédex



Pokemon Go

Scenario



User

User Target

Animal lovers, Explorers, Gamers

Context of use

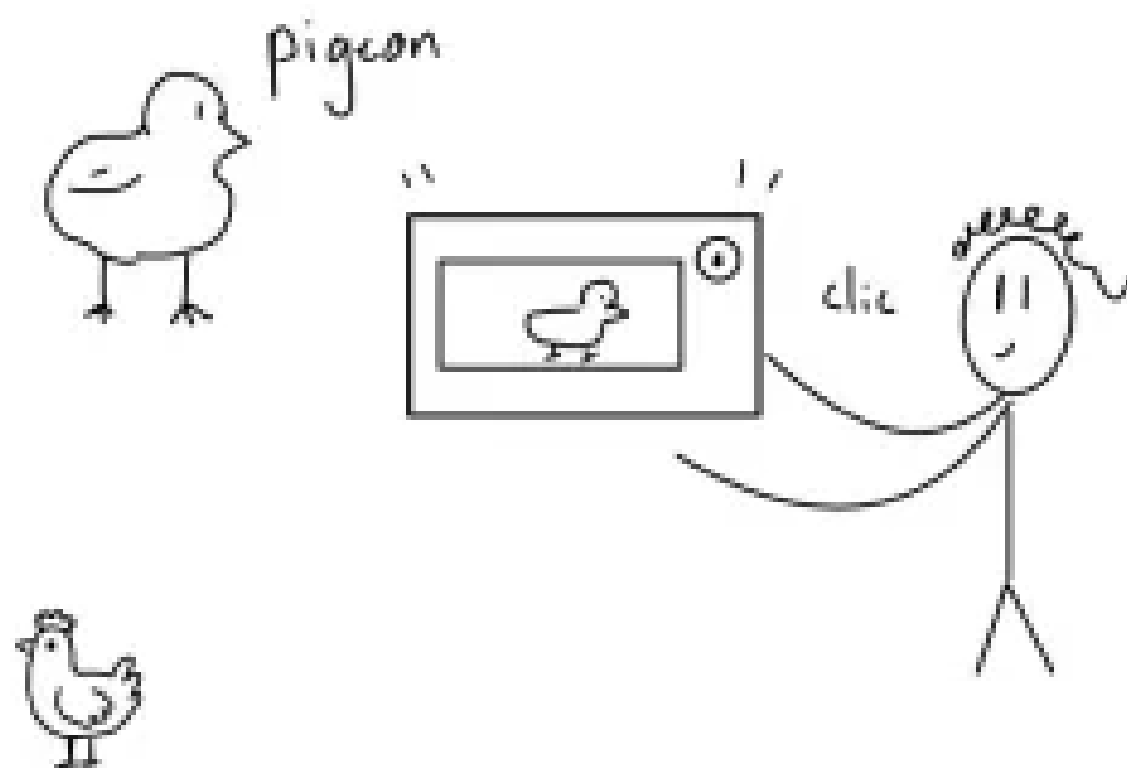
Phone app, website
In the street, at home

User's goals

Catch all animals
Discover species
Increase the accuracy of
the model

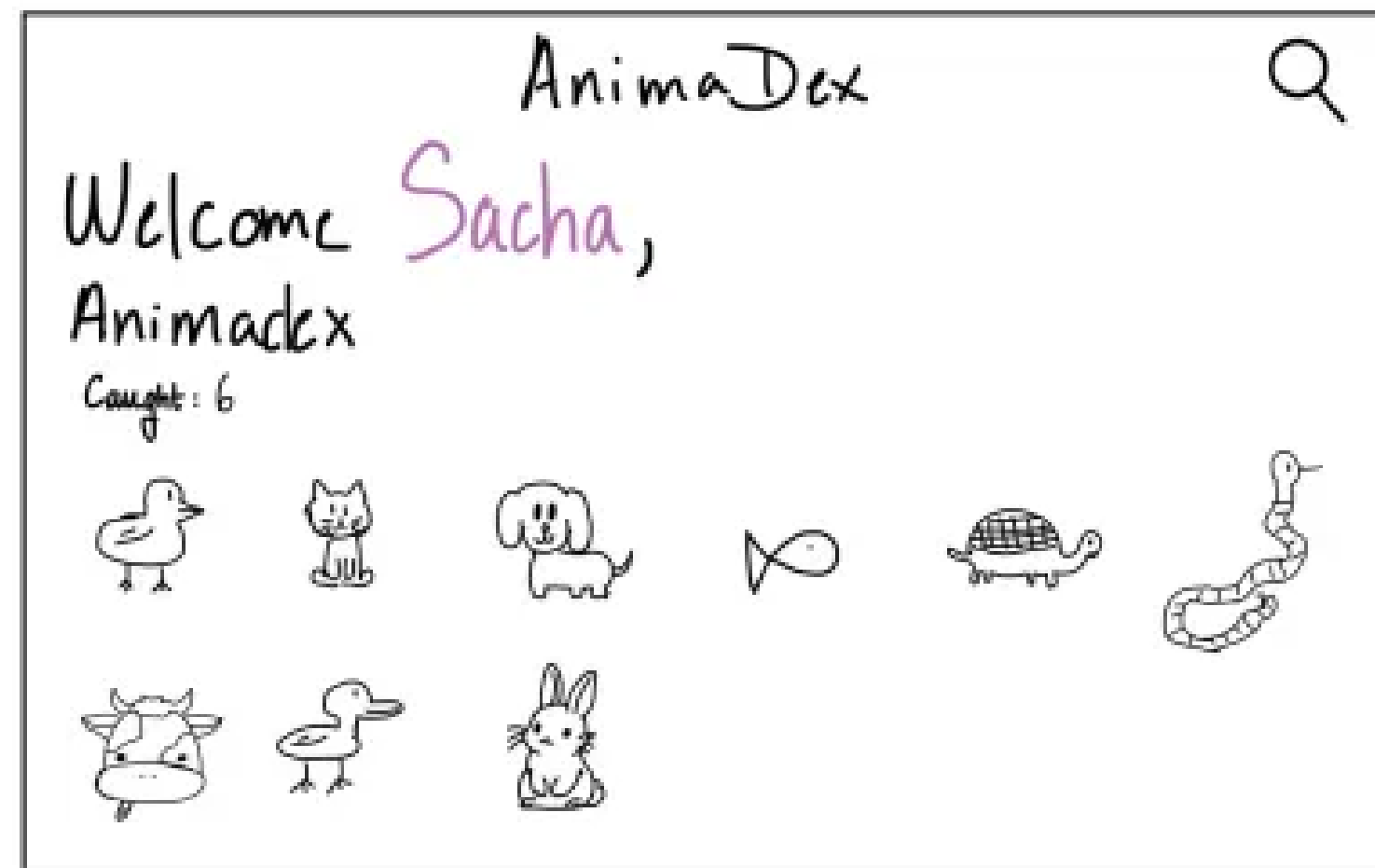


Sketches





Sketches



Literature review

1. Wildlife Monitoring Using Deep Learning Models

Proceedings of the National Academy of Sciences (PNAS), 2018.

<https://doi.org/10.1073/pnas.1719367115>

2. Automated Animal Identification in Marine Ecosystems

Ecological Informatics, 2018.

<https://doi.org/10.1073/pnas.1719367115>

3. ZooScan: A Novel Approach for Plankton and Animal Image Classification

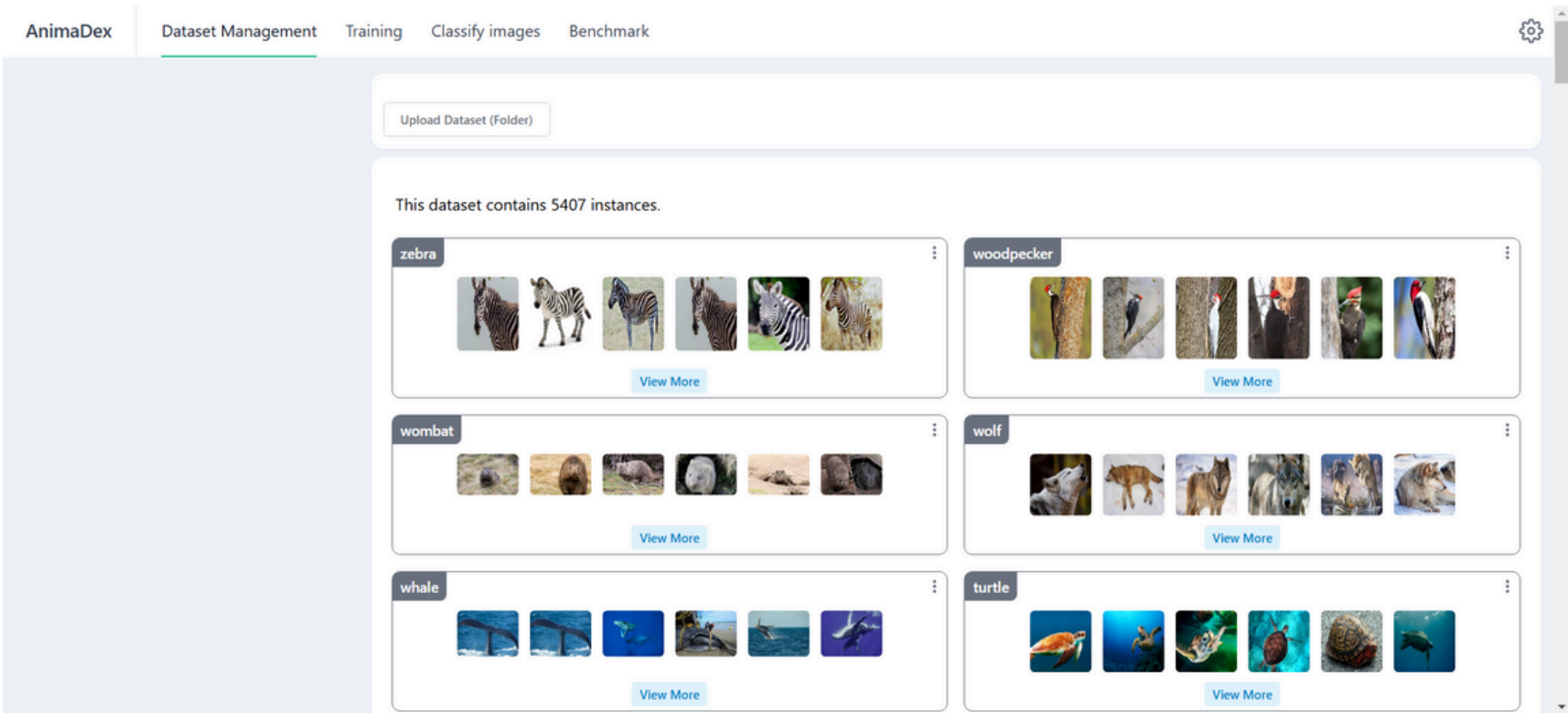
Journal of Plankton Research, 2004.

<https://doi.org/10.1073/pnas.1719367115>

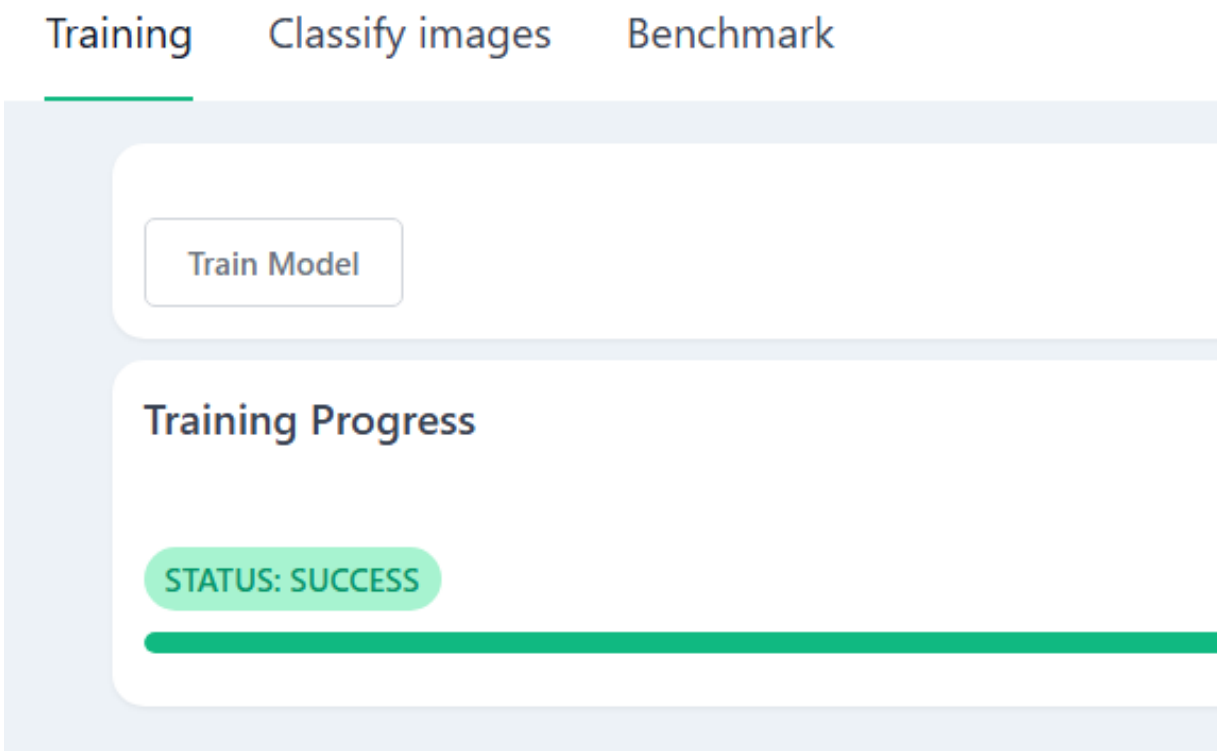


UI

AnimaDex Dataset Management Training Classify images Benchmark



Dataset Management



Training



UI

AnimaDex

Dataset Management

Training

Classify images

Benchmark

Upload Images To Classify (Folder)

Processing image 8/9: pigeon.webp

Predicted: pigeon (confidence: 66.7%) Image: pigeon.webp

✓ Correct (Add to Training)

✗ Incorrect

Testing complete! Accuracy: 77.78%

Classify images

Benchmark



Interactions

1. Upload images from his gallery/file explorer

To add an image to the dataset and to catch an animal the user need to upload a photo first

2. Choose to add the photo to the dataset

Based on the accuracy and the prediction that the model gave the user can choose to add or not add the photo to the dataset

3. Retrain the model with new images

Once the user have catch some photos he can retrain the model with those images increase the accuracy of the model

4. Explore the dataset

The user can see every images from the dataset and remove some if he want to.



Training dataset



Number of class : 90

Number of images : 5400

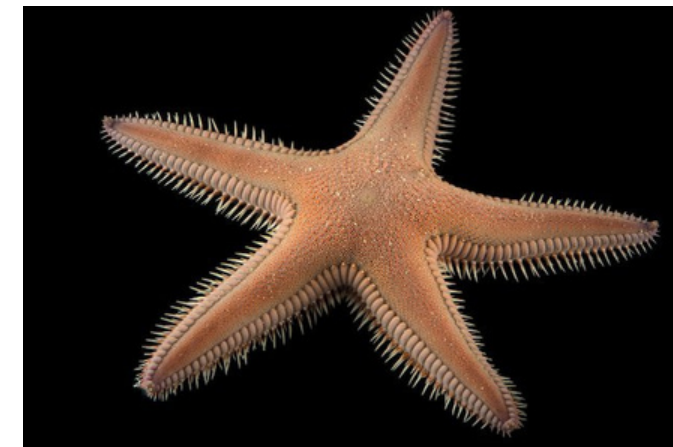
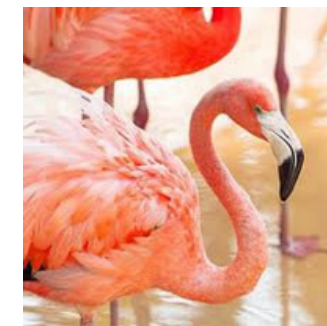
kaggle

Examples of class :

antelope, badger, bat, bear, bee, beetle, bison, boar,
butterfly, cat, caterpillar, chimpanzee, cockroach, cow,
coyote, crab, crow, deer, dog, dolphin, turtle, whale, wolf,
wombat, woodpecker, zebra.

Implementation

Training dataset



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Classifier

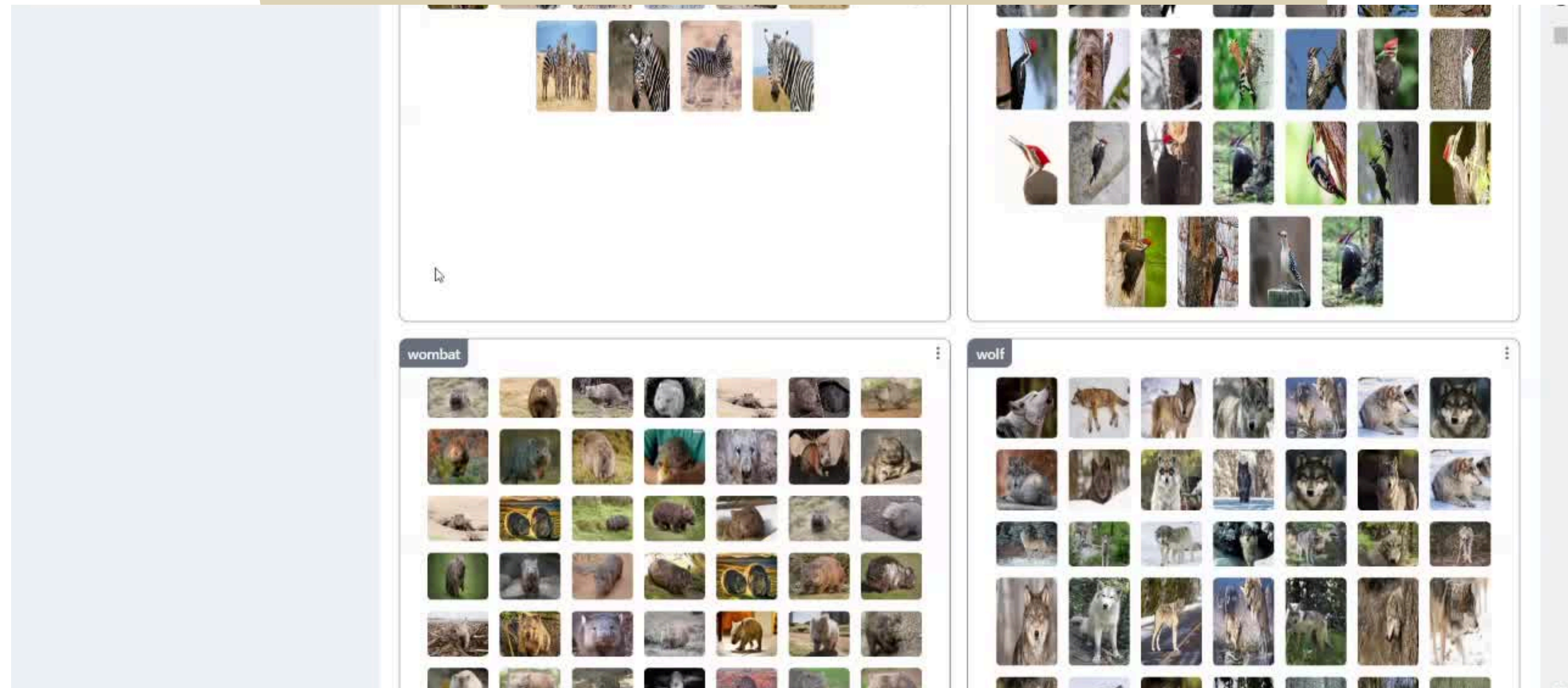
MobileNets (Google) -> Convolutional Neural Network



Model: K-nearest neighbors (KNN)
Less calculations = efficient, light, fast
but maintaining a respectable performance



Demonstration



Evaluation method

Model training

Objective: Determine the accuracy of the animal classifier both before and after retraining with user-contributed images.

Method: Split-test approach : Comparison between the classifier's performance on a fixed test set of images before and after retraining

User

Objective: Determine how intuitive and easy-to-use the interface is for new users and measure how engaging the app is.

Method: User testing sessions : Observe participant interactions while they are performing tasks and ask for feedback on the interface and process.

Track metrics over time : Number of images uploaded
frequency of use





Thank you !



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