Dog Breed Identification

CSYE 7200 Final Project Team 10

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Goals

- This app aims at helping users to identify dog's breed based on their uploaded image;
- System would differentiate dogs and non-dogs photos and list the top three most possible breeds for that dog, according to dog's face inside image;
- System could also detect human faces within the images and mark them out;
- This system would be useful for classifying photos into categories based on different breeds of dog.

Use Case

General users:

By uploading image to app, they can

- **Identify Dog's Breed:** app will help identify image with dog and give Top 3 guesses of dog's breed along with probability.
- **Recognize Human Face:** app can also mark all human faces inside the image.

Business users:

By sending large amount of photos, they can

- **Classify Images:** app can differentiate images with dog from those without and classify the images into categories according to dog's breed.

Methodology

- **Data Ingestion:** Akka Stream
- **Data Preprocessing:** OpenCV
- **Facial Detection:** Facial Keypoint Localization
- **Training:** CNN (Convolutional Neural Network) based on Tensorflow
- **Visualization:** Zeppelin / Play

Data Source

- Mainly from Kaggle's competition -- "Dog Breed Identification"; including training dataset (10,223 images) and test dataset (10,358 images) https://www.kaggle.com/c/dog-breed-identification/data

- Additional data sources would come from several pets websites. eg: http://www.akc.org/dog-breeds/

Milestone

- Week 1 (Nov. 4 - 10): Project Proposal

- Week 2 (Nov. 11 - 17): Data Ingestion & Data Preprocessing

- Week 3 (Nov. 18 - 24): Facial Detection

- Week 4 (Nov. 25 - Dec. 1): Data Training by Convolutional Neural Network

- Week 5 (Dec. 2 - 8): Visualization

Criteria

- The Precision of dogs image recognition >= 60%, and the Recall >= 60%;
- The Possibility of getting correct breed of dog within 3 guess >= 60%;
- The Precision of human face recognition >= 90%, and the Recall >= 85%.

Program

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Repository

- **Programming in Scala:**
  - Data ingestion and preprocessing;
  - Facial detection;
  - Data visualization.

- https://github.com/cicioutofspace/CSYE7200_FinalProject