

Humpback Whale Identification: a Kaggle competition

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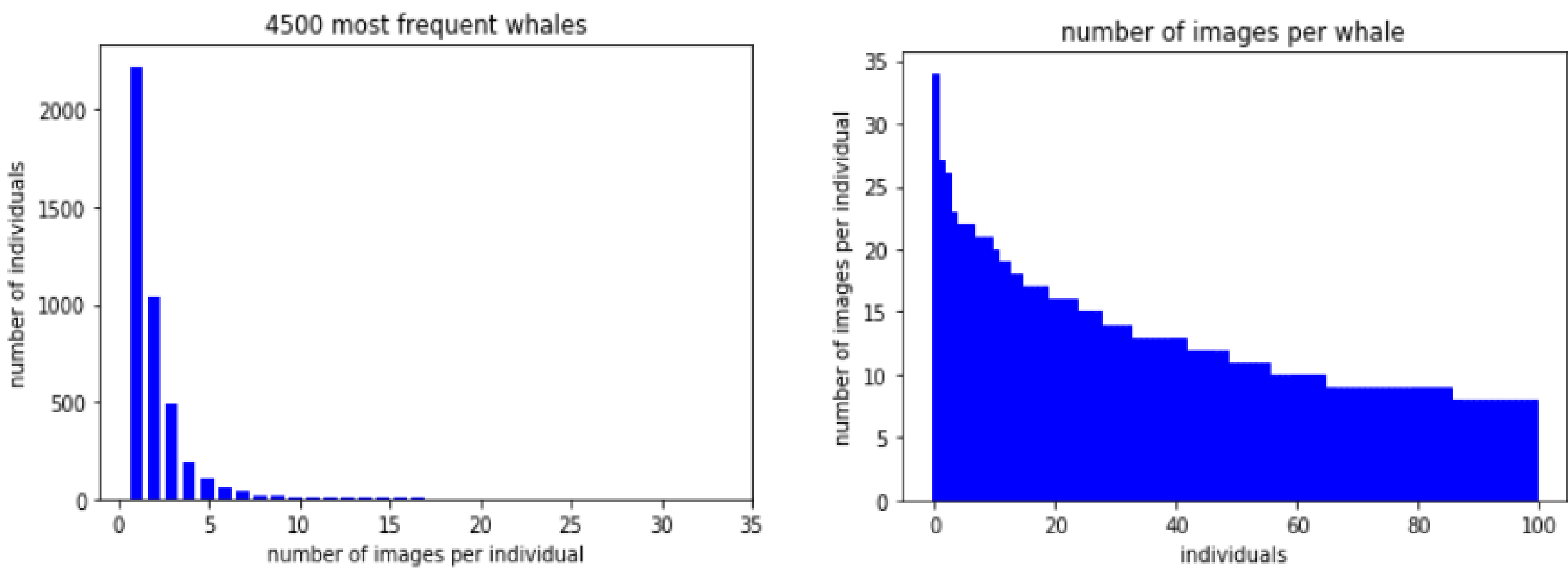
The Challenge

- 40 years of scientific whale monitoring generated a large collection of images of tail flukes of Humpback whales
- 25,000 images were assigned to >4,000 individual whales by researchers
- Try to recognize the whales by their flukes with a deep learning model



Statistics

- Sparse and unevenly distributed data base:
- 9,500 labeled images of 4,500 whales as training data
 - 2,000 whales, where only one image is available
 - 1,000 whales with 2 images
- 15.000 images as test data
- Images differ largely in
 - shape
 - resolution and quality
 - color / grayscale



Our Approach

- Use large CNNs pretrained on image-net Database as provided by Keras
- “Freeze” parameters of pretrained cnn base-models, and train on our classification task with 2-3 additional dense layers
- Models: InceptionV3, Xception, ResNet50, MobileNet, InceptionResNetV2
- After training of dense layers “unfreeze” some of the top layer-blocks of the cnn base-model and train more epochs
- Use Data Augmentation: shifting, stretching, rotating
- Optimize hyper parameter configuration using “HyperbandSter” framework

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Results

