Bird Identification

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Problem

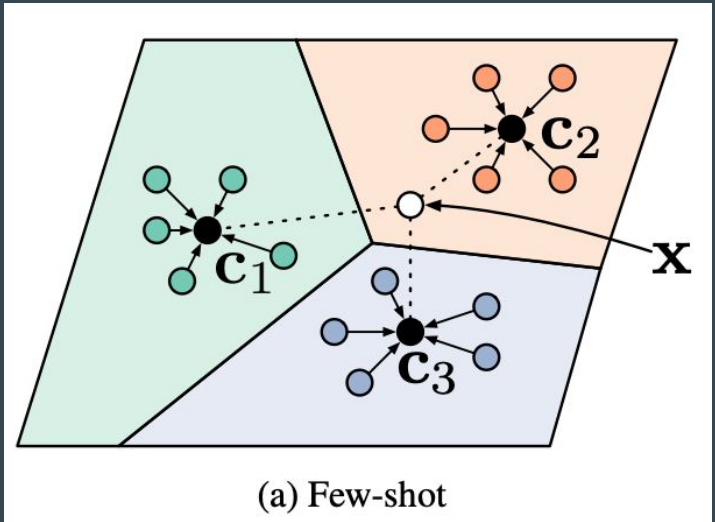
- Over 10,000 different species of birds
- Difficult to differentiate them without expert knowledge
- Process is very time consuming

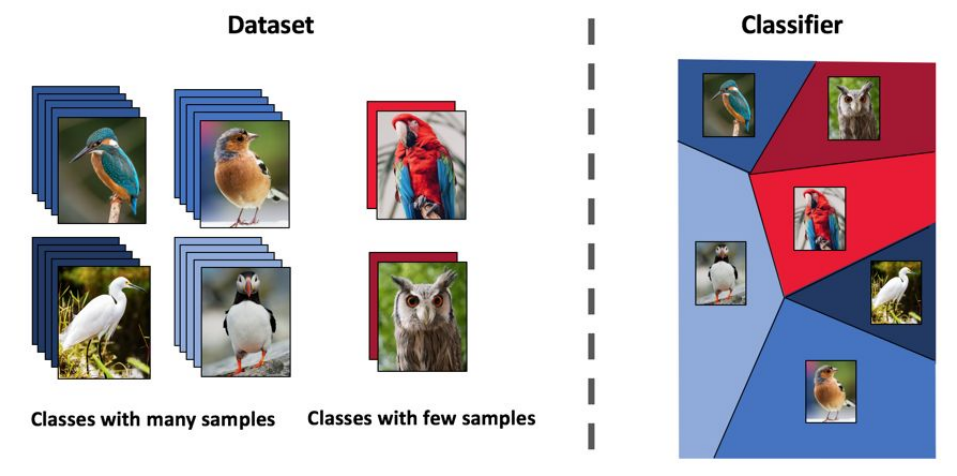
Data

- Bird Species - Kaggle dataset
  - 29,000 training images over 200 different bird species
  - Images in 224x224x3 format with over 100 training images for each type

Background - Few Shot Learning & Prototypical Networks

- Classifies new data given a few training images
- Prototype is the mean of the support set in the embedding space





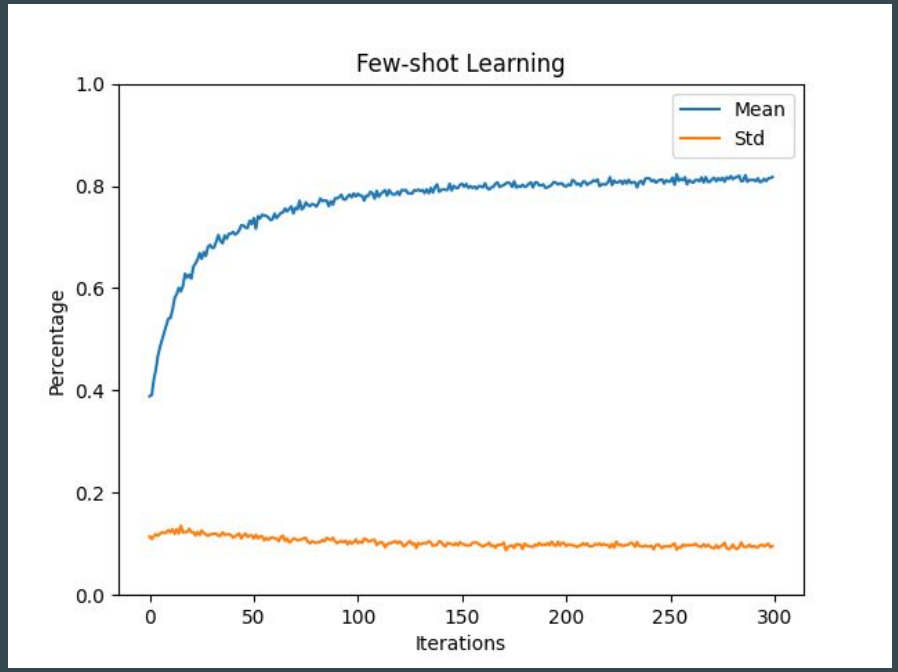
Approach

- Data split into train, dev, and test sets of size 140, 30, 30
- Vgg11 model used
- Euclidean distance calculated between prototypes and queries

ConvNet Configuration					
A	A-LRN	B	C	D	E
11 weight layers	11 weight layers	13 weight layers	16 weight layers	16 weight layers	19 weight layers
input (224 × 224 RGB image)					
conv3-64	conv3-64 **LRN**	conv3-64 **conv3-64**	conv3-64 conv3-64	conv3-64 conv3-64	conv3-64 conv3-64
maxpool					
conv3-128	conv3-128	conv3-128 **conv3-128**	conv3-128 conv3-128	conv3-128 conv3-128	conv3-128 conv3-128
maxpool					
conv3-256 conv3-256	conv3-256 conv3-256	conv3-256 conv3-256	conv3-256 conv3-256 **conv1-256**	conv3-256 conv3-256 **conv3-256**	conv3-256 conv3-256 conv3-256 **conv3-256**
maxpool					
conv3-512 conv3-512	conv3-512 conv3-512	conv3-512 conv3-512	conv3-512 conv3-512 **conv1-512**	conv3-512 conv3-512 **conv3-512**	conv3-512 conv3-512 conv3-512 **conv3-512**
maxpool					
conv3-512 conv3-512	conv3-512 conv3-512	conv3-512 conv3-512	conv3-512 conv3-512 **conv1-512**	conv3-512 conv3-512 **conv3-512**	conv3-512 conv3-512 conv3-512 **conv3-512**
maxpool					
FC-4096					
FC-4096					
FC-1000					
soft-max					

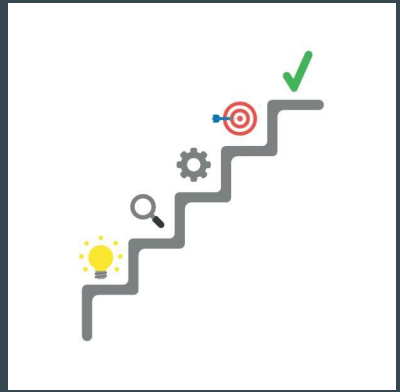
Key Results

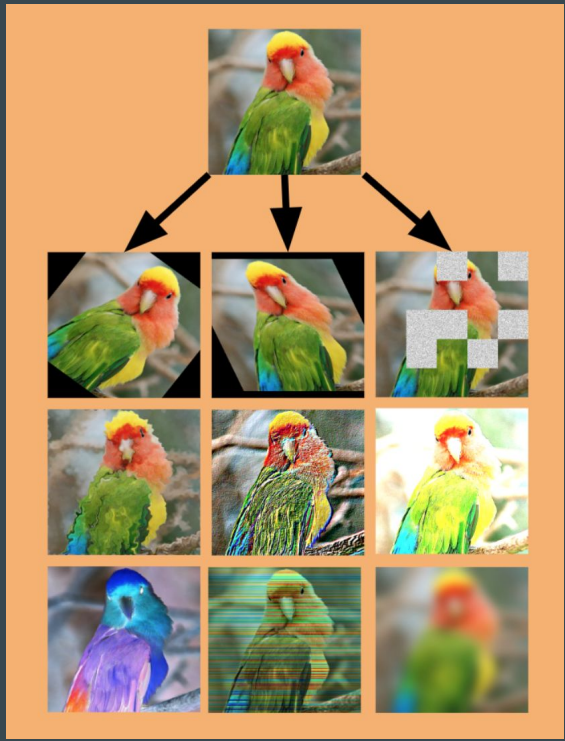
- 100 iterations 100 episodes did not converge
- 300 iterations 500 episodes seems to reach convergence
- 60%, 15% mean/std no pre-training
- 80%, 10% mean/std pre-training



Next Steps

- Perform image augmentation on the dataset
- Further tuning of vgg11 model
- Split dataset into male/female datasets





Questions?

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