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Code Available

Birds of a Feather Flock Together
Local Learning of Mid-level Representations for Fine-grained Recognition

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Alexander Freytag, Erik Rodner, and Joachim Denzler

Computer Vision Group, Friedrich Schiller University Jena, Germany

http://www.inf-cv.uni-jena.de

Friedrich Schiller University Jena
Computer Vision Group

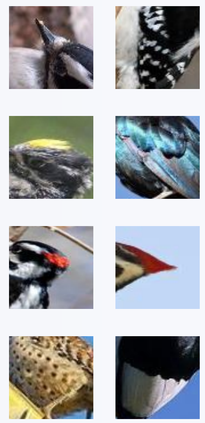
Motivation

Do we need to know how to differentiate between 20 eagle species, when we currently spot a singing bird?

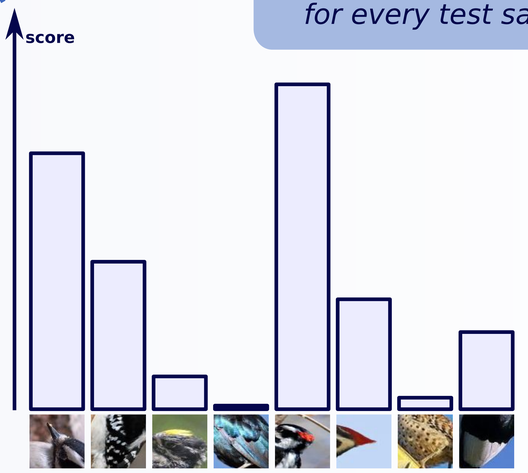
"*When solving a given problem, try to avoid solving a more general problem.*"
V. Vapnik

Nearest Neighbor Matching

Discovery of Discriminative Features



Encoding + Local Learning



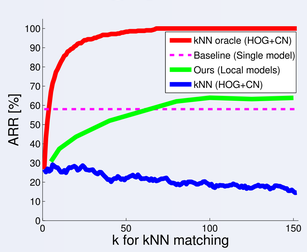
Approach

*We propose to learn image representations **and** classification models for every test sample on the fly.*

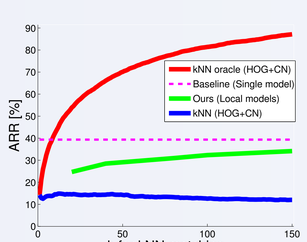
Method

1. Find k nearest neighbors based on HOG and Color Names
   . . .find roughly similar birds.
2. Learn representations for those images only
   . . .learn subtle details.
3. Learn models with k nearest neighbors only
   . . .discriminate subtle details.
4. Encrypt and classify test image
   . . .compare subtle details with similar birds.

Matching performance



CUB-2011-14



CUB-2011-200

Local Learning ECCV WS'14

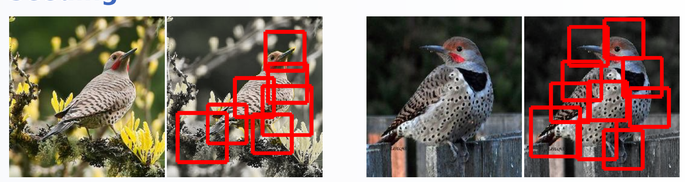
Patch Discovery GCPR'14

Classification performance

Approach	CUB-2011-14	CUB-2011-200
Dataset (Wah, TechReport 2011)	-	10.25%
Single representation	58.01%	39.35%
Local representation (K = 150)	*63.89%*	*34.16%*
Style-awareness (Lee, ICCV 2013)	-	38.31%
POOF (Berg, CVPR 2013)	70.10%	56.78%
Part-Transfer (Goering, CVPR 2014)	73.39%	57.99%
Local representation (K = 150) + (Goering, CVPR 2014)	**76.64%**	**58.55%**

Wah et al., *"The caltech-ucsd birds-200-2011 dataset."* (Caltech 2011)
Lee et al., *"Style-aware mid-level representation for discovering visual connections in space and time."* (ICCV 2013)
Berg and Belhumeur, *"Poof: Part-based one-vs-one features for fine-grained categorization, face verification, and attribute estimation."* (CVPR 2013)
Göring et al., *"Nonparametric part transfer for fine-grained recognition."* (CVPR 2014)
Freytag et al., *"Exemplar-specific patch features for fine-grained recognition."* (GCPR 2014)

Seeding



Bootstrapped Detectors

Detection Responses