

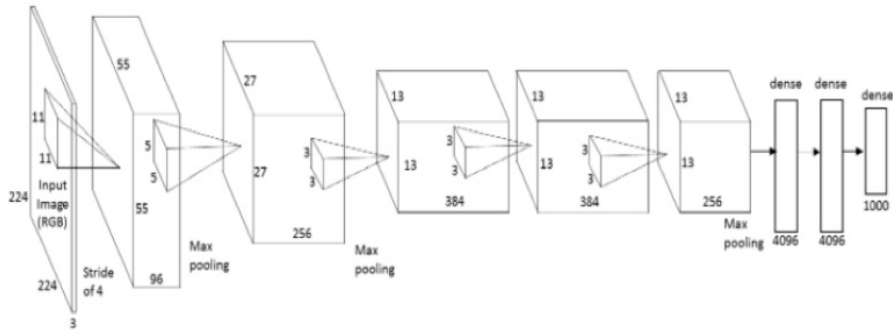


Learning to Learn Image Classifiers with Informative Visual Analogy

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The shortage of Deep Learning:



↑
Data Hungry

↑
Hard to Learn New Category

Human are far better learners:



Similar



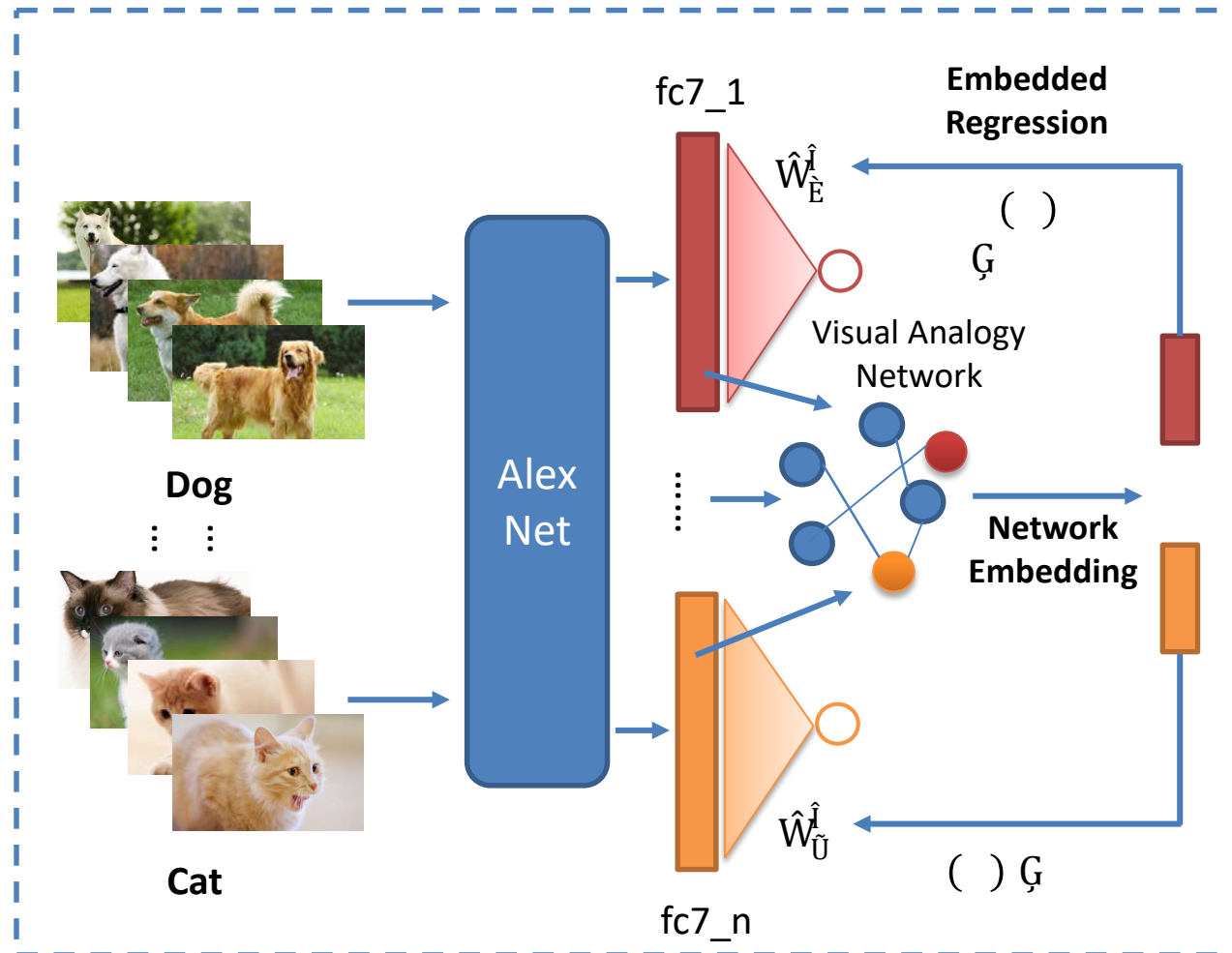
Dogs
(Already Learned)

Wolves
(To be learned)

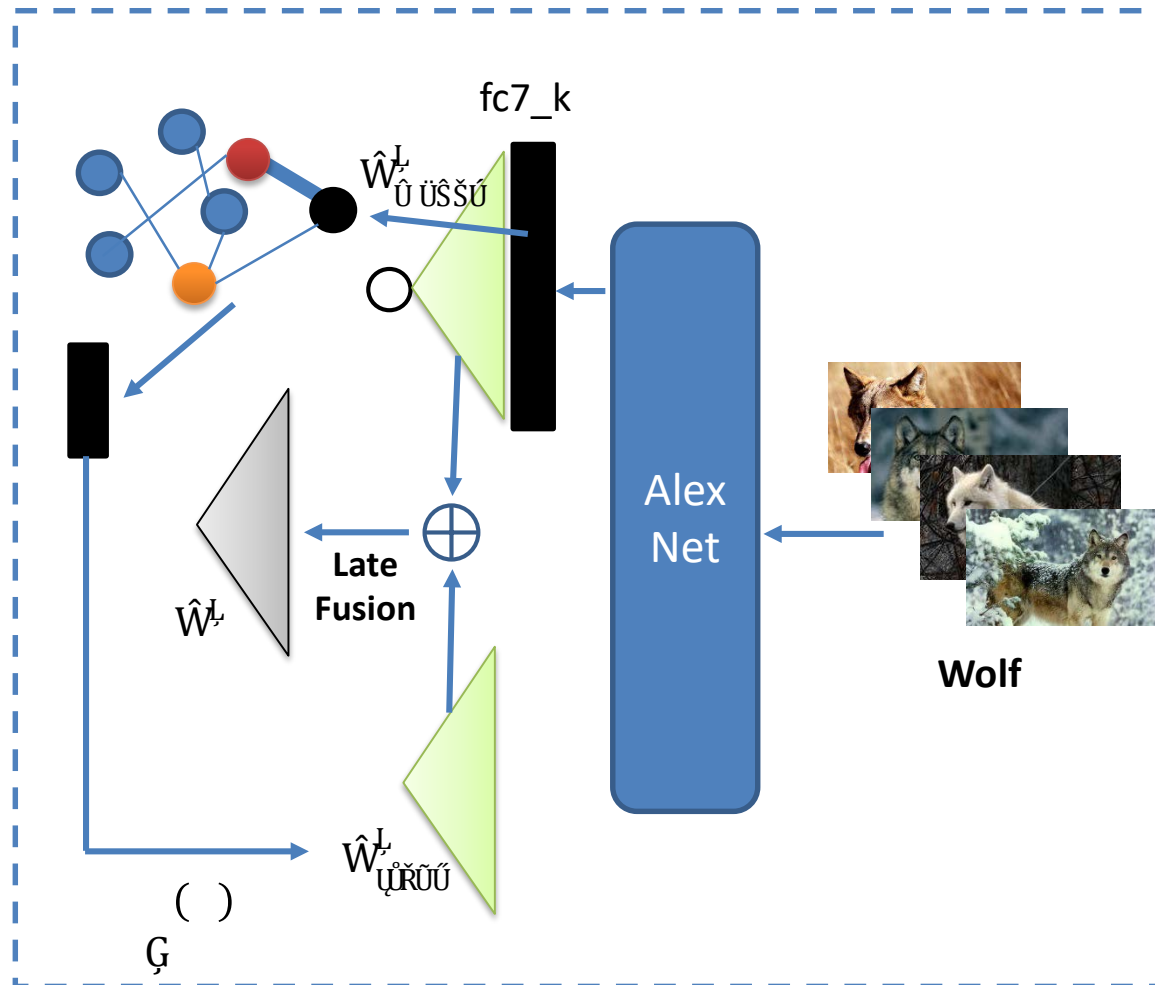
After observing only **one** or a few images, humans could learn wolves better. As humans have a mechanism of **visual analogy**.

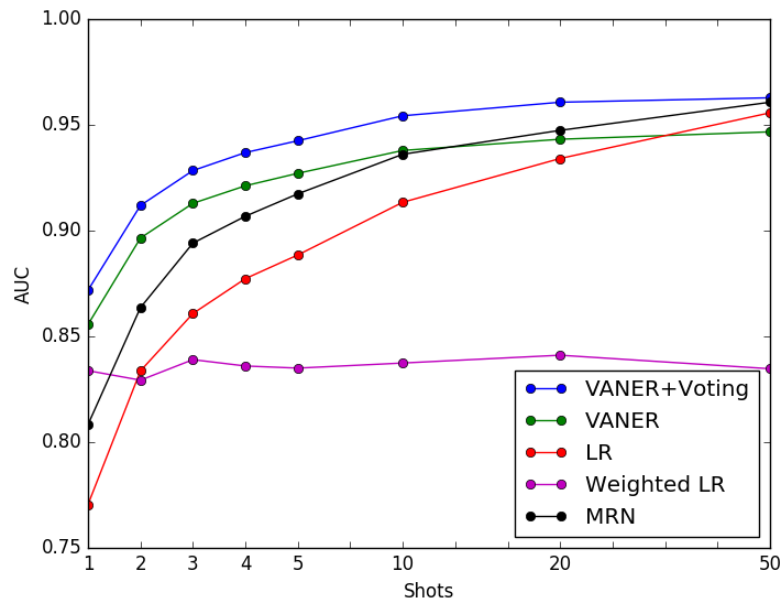
How to learn the parameters of a novel class via visual analogy?

VANER: Visual Analogy Network Embedded Regression Training base classes with VANER



Generalization to a new class





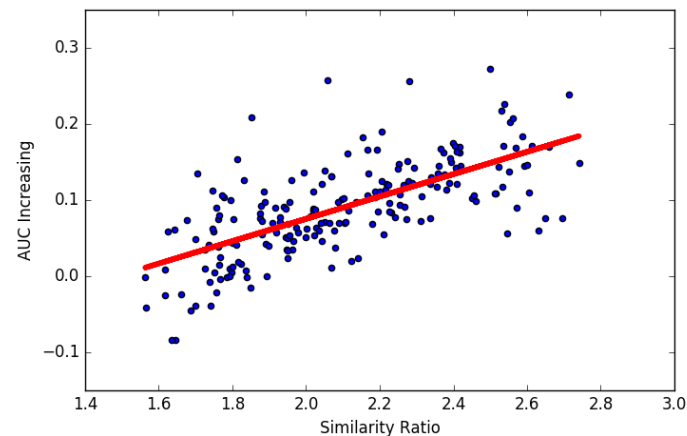
I. Algorithm Performance

II. Insightful Analysis



























$$\frac{\hat{A} \quad \zeta}{\zeta \quad \hat{A} \quad \hat{A} \quad \zeta}$$

$$AUC \text{ Increasing} = AUC \text{ for VANER} - AUC \text{ for LR}$$



III. Embedding Similarity



Novel Class	 Jeep	 Zebra	 Lemon	 Lion	 Screen	 Restaurant
Top-3 Similar Base Classes	 Pickup	 Echidna	 Orange	 Cougar	 Monitor	 Shoe_shop
	 Beach_wagon	 Leopard	 Acorn	 Dingo	 Laptop	 Marimba
	 Tow_truck	 Cheetah	 Granny_Smith	 Lynx	 Television	 Bakery

Experiment Settings:

- 800 Base Classes in ImageNet for training VANER
- 200 Novel Classes, each used for binary classification with whole base classes
- Evaluation Metric: AUC / F1 score



THANK YOU

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