Extreme vocabulary learning

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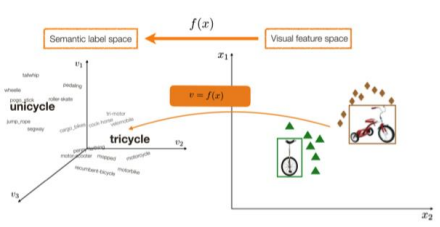
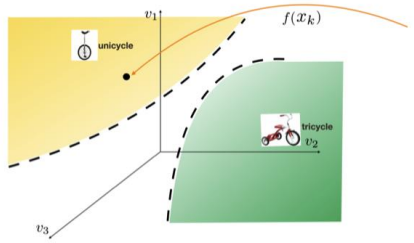
Problems & Ideas

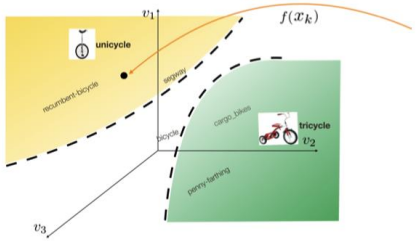
- Problems of Vocabulary-informed Learning, Zero-Shot Learning
  - Using semantic space to inference visual class labels
- Ideas: Using extreme value theory to constrain the semantic space
  - Extreme Vocabulary Learning
  - Coverage/Margin Distribution



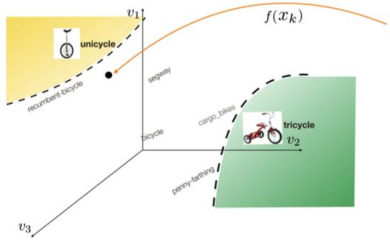
(a) $f(x)$ maps feature to semantic spaces.



(b) Semantic space only has "unicycle" and "tricycle".



(c) Semantic space with extra vocabulary



(d) Refined boundary by learning from extra vocabulary

Main Contributions

Experiments on two benchmark datasets demonstrate the effectiveness of proposed framework against conventional ways – SSVoc & SVR

(%)	SVR	SS-Voc	EVoL	Chance
Supervised Learning	56.05	**56.57**	56.34	2.50
Zero-shot Learning	51.65	52.82	**53.37**	10.00

Table 1 Top-1 Results on AwA-PCA dataset in Supervised Learning (SL), and Zero-shot Learning (ZSL).

Hit@K	1	2	4	6	8	10	15	20
SVR	3.90	5.50	8.30	10.80	13.00	16.72	23.83	**27.43**
SS-Voc	3.81	5.71	8.50	10.60	13.10	16.42	23.32	26.62
EVoL	**4.11**	**5.81**	**8.80**	**11.30**	**13.80**	**17.64**	**23.94**	27.21

Table 2 The results of Open-set recognition on AwA-PCA dataset.