Multilabel classification through structured output learning

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content

- machine learning
- single label classification
- multilabel classification
- structured output learning
- future work
- what can we do

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Example: dog vs. cat?

- We have 5000 pictures of dog and 5000 pictures of cat.

- Computer digitalize each picture into 100×100 pixels.
- Given a new picture, we want to answer: is it a dog or a cat?
- Simple task for human, dog, or cat.
- Golle (2008) claimed this is a difficult task for machines with only 82.7% accuracy.
- In 2013, 98.5% accuracy was reported in a Kaggle competition (https://www.kaggle.com/c/dogs-vs-cats).

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Why?

- Is the human verification system safe from machine learning attack.
  - CAPTCHA vs. ASSIRA

- If machine can assign correct attibute to all pictures, we can search pictures by attributes.

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► Search all cat pictures.

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► Search all dog pictures.

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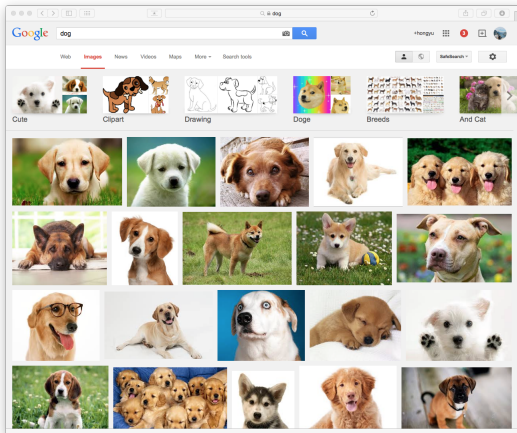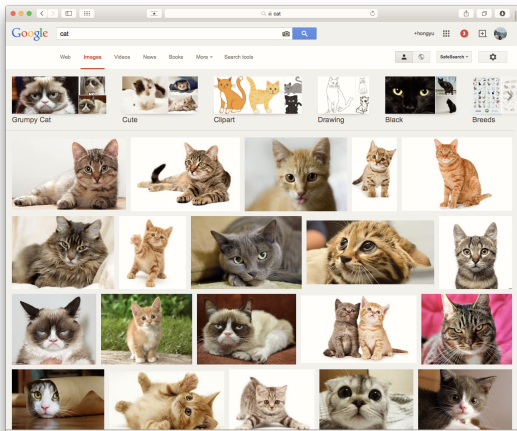
Single label classification

►

Future work

►

To get benefit?

- ▶ Fingerprint identification
- ▶ Voice recognition
- ▶ Information assistant

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To contribute?

- SETI@home
- Rosetta@home
- Foldit

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