Distributional Semantics

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SLIDES ADAPTED FROM YOAV GOLDBERG AND OMER LEVY

Word Representation

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- Computers often use one-hot representations
- Or fragile knowledge bases
- Distributional Hypothesis (Harris, 1954; Firth, 1957)
- Know the word by the company it keeps

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  - How our eyes do it!
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  - OCR is often preprocessing step
- Use strings?
  - Wasteful of memory
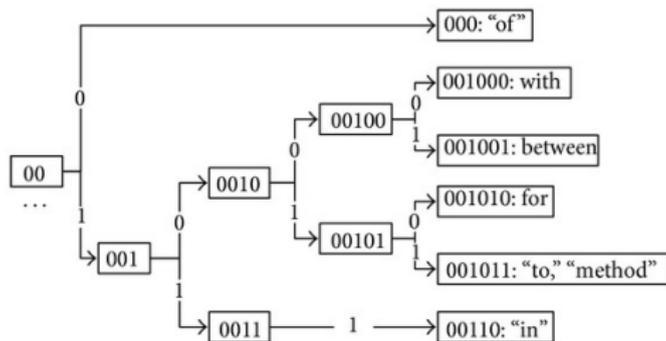 - Is dOg different from Dog?
  - What about " dog" and "dog"?

What we've already done

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- Can also remove plurals, verb forms, etc. (more later)
- Then, you can represent each word as an **integer**

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- Can also remove plurals, verb forms, etc. (more later)
- Then, you can represent each word as an **integer**
  - Memory efficient
  - Removes connections between words

What about a dictionary?

- **WordNet**: electronic dictionary
- **Brown clusters**: automatically built tree
- **Lesk algorithm**: from dictionary (use tf-idf cosine)

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Pizza

a dish of Italian origin consisting of a flat, round base of dough baked with a topping of tomato sauce and cheese, typically with added meat or vegetables.

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a dish originally from Italy consisting of dough made from durum wheat and water, extruded or stamped into various shapes and typically cooked in boiling water.

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- Infinitely deep rabbit hole!

Intuition (from Boroni)
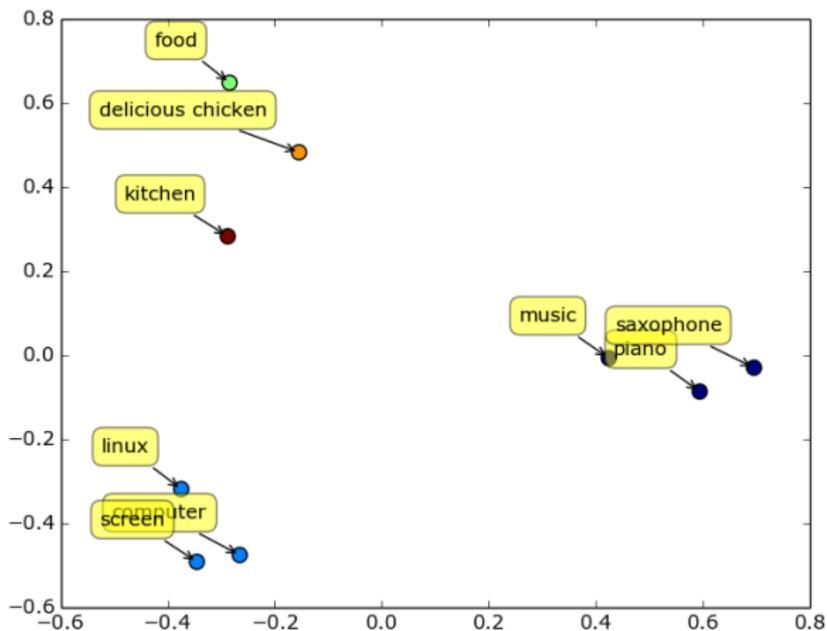
Marco saw a furry little wampimuk hiding in the tree

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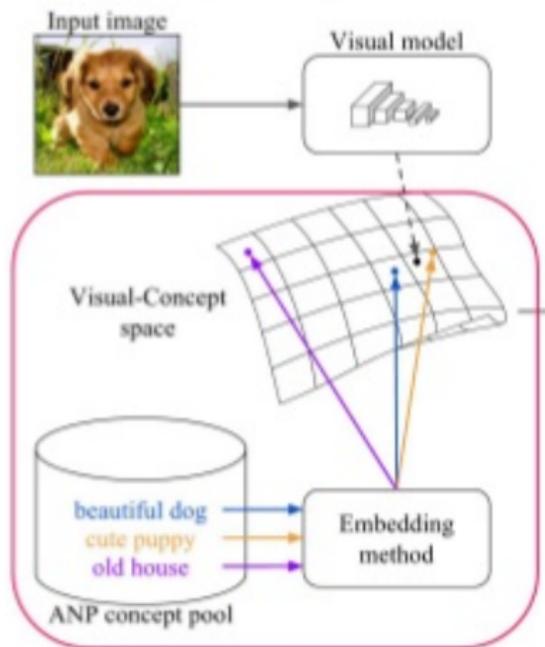# Continuous Representation!

Definitions

Distributional Word Representation

Encoding a word's meaning from how it is used in a corpus

Distributed Representation

Encoding a word's meaning in a compact, dense, low-dimensional
representation

Usefulness

- Multimodal
- Multilingual
- Useful downstream feature