

# Applications and Frontiers

## NLP

- Use previous words to calculate prob of next
- Word feature vectors clustered by similarity
- Signs of sensible algebra in word feature space
  - Relations between words seem to be preserved (transition from man to king same as transition from woman to queen)

## Computer Vision

- Use histogram of gradients (HoG) to classify similar ‘features’
  - Can be similar colors, lighting, etc.
- Similar to how human vision system works

## Deep Unsupervised Learning

- Don’t necessarily need to define labels for features
- Can be used to prime supervised learning
- Two stages:
  1. Pre-training  $\triangleq$  train a large model with a lot of data on a supervised pretext task
  2. Fine-tune  $\triangleq$  continue training the same model on a task you care about

## Forecasting Progress

- Question: what would happen if we made the model bigger / added more data
  - How would the accuracy scale?
- Can predict a model in terms of compute