Understanding Personality with Deep Convolutional Neural Networks

Massachusetts Institute of Technology
School of Engineering
SuperUROP
2015–2016

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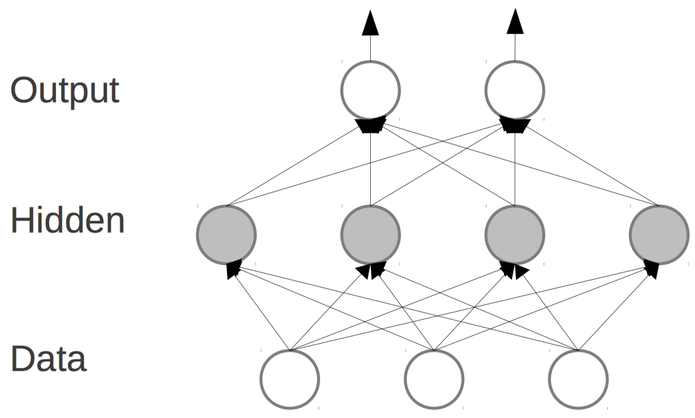
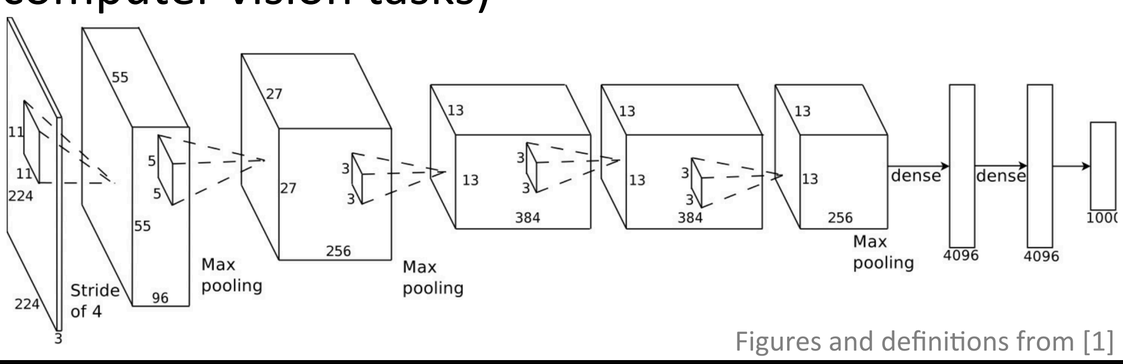
Neural Networks

A neural network computes a differentiable function of its input



A convolutional neural network (CNN) applies the same function to each section of the input (good for computer vision tasks)



Figures and definitions from [1]

Predicting Personality from Video

Personality can usually be inferred from watching videos of a person

Elle Woods: Comfortable around people

Forrest Gump: Has good intentions

Jack Sparrow: Uses others for his own ends

Approach

Problem

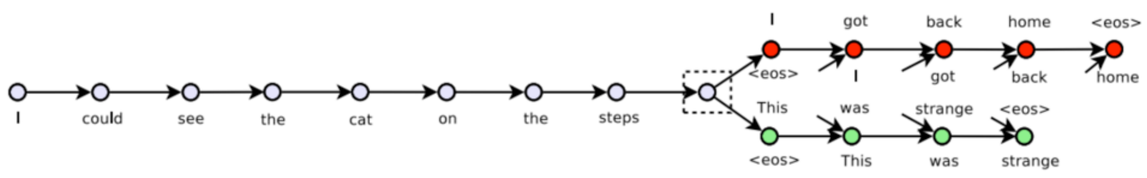
- It's difficult to collect lots of personality data
- Deep networks need lots of data to train

Hypothesis

- We can predict what a person might say from video
- What a person says is correlated with their personality

Prediction Task

- Predicting *exactly* what a person will say isn't well defined, so predict speech clusters instead
- Use skip-thoughts to create these clusters



- Skip-thoughts model: a sentence is encoded and the model tries to reconstruct the previous and next sentences.

See [2]

The Data

~81,000 clip + subtitle pairs across 100 Hollywood movies

00:38:34.643 → 00:38:38.229
You can die, too, for all I care!

Personality quizzes for movie characters from Mechanical Turk (~240 complete, goal 1000)

How accurately does each phrase describe the character?

	Phrase	Inaccurate		Neither		Accurate
1	They worry about things.	○	○	○	○	○
2	They make friends easily.	○	○	○	○	○
3	They have a vivid imagination.	○	○	○	○	○
4	They trust others.	○	○	○	○	○
5	They complete tasks successfully.	○	○	○	○	○
6	They get angry easily.	○	○	○	○	○
7	They love large parties.	○	○	○	○	○

Example from The Princess Bride

Next Steps and References

- Does predicting a person's speech allow a personality representation to emerge?
- If skip-thought and personality correlation is strong, train a model to take personality quiz from skip-thoughts
- Try out different network architectures and determine which is the most successful for prediction
- Train and test on additional datasets: TV shows, real-world videos

References

[1] http://www.image-net.org/challenges/LSVRC/2012/supervision.pdf
[2] https://papers.nips.cc/paper/5950-skip-thought-vectors.pdf