Week 4 Presentation

Sahil Shah

Learn about HMM

- Read papers about how Hidden Markov Models work and their application to computer vision

Format Event Annotations

- Given annotations for 3 classes (board trick, flash mob, making a sandwich)
- Quantize data – give each type of concept a numerical ID
- Tabularize data based on video

Train HMM

- Use annotation data to generate the maximum likelihood prior, transition and observation matrices
- Separate HMM model for each of the three classes

Test HMM

- First test was of each video against each of the three models
- 82 correct classifications out of 88 videos (93% precision)
- High precision expected because annotations were done manually for preliminary tests

Test HMM #2

- Partition training and testing data using K-Fold for each event (K=5)

testing/training

	E001	E008	E011
Log likelihood	-61 / -411	-91 / -343	-∞ / -85
	-∞/-331	-63 / -372	-13 / -88
	-127/-375	-77 / -356	-19 / -84
	-115/-363	-103 / -329	-13 / -90
	-98/-374	-110 / -326	-∞ / -47
Average	-100 / -371	-89 / 345	-15 / 78.8

Test HMM #3

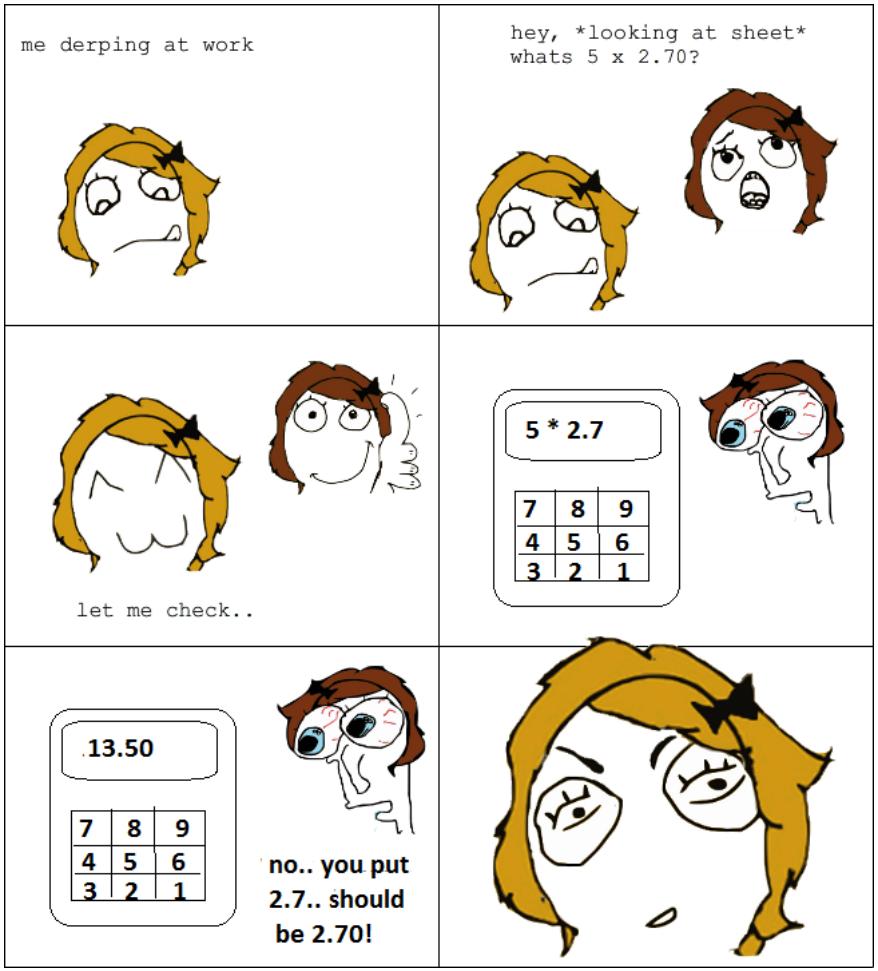
- Forward algorithm (also known as α-pass)
- Calculate P(O | λ) / N^T

Test ID	T	P(O | λ)	P(O | λ) / N^T
1	9	5.55e-6	10.8
2	13	2.50e-10	.305
3	7	1.48e-6	.288
4	6	4.75e-5	0.7423
5	10	4.71e-18	4.6e-10

Continuing Work

- Look at why the forward probabilities are so low
- Look at the effects of varying the number of hidden states
- Train this HMM for more annotations to get a better idea of its effectiveness

The end


me derping at work
hey, *looking at sheet*
whats 5 x 2.70?
let me check..
5 * 2.7
7 8 9
4 5 6
3 2 1
13.50
7 8 9
4 5 6
3 2 1
no.. you put
2.7.. should
be 2.70!