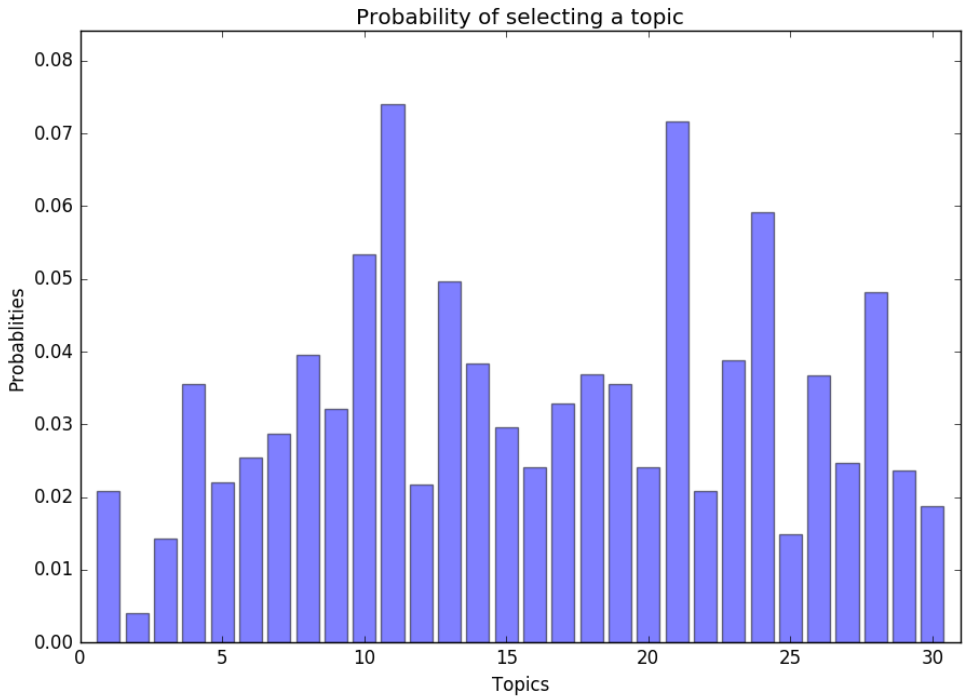
REPORT

EM Topic models. *Implement the multinomial mixture of topic models yourself (i.e. not use a package for clustering).*

- *Cluster this to 30 topics, using a simple mixture of multinomial topic model, as lectured in class.*
- *Produce a graph showing, for each topic, the probability with which the topic is selected.*
- *Produce a table showing, for each topic, the 10 words with the highest probability for that topic*

Below is a graph of probabilities for each topic. The probabilities do sum up to 1. The algorithm required 10 iterations to converge. The distribution of probabilities and the number of iterations may be different from run to run due to the fact that clustering may result in different local optima.



Below is a table of top 10 words for each topic. Each time I get different results, but some words like network, model, neural, data, set, etc. get repeated in many runs. Of special interest is topic 27 which managed to capture something very different than other topics and is, in this respect, unique.

Topic/Word	1	2	3	4	5	6	7	8	9	10
Topic 1	object	model	network	point	neural	function	problem	matching	view	set
Topic 2	function	graph	model	matching	set	data	level	kernel	algorithm	splines
Topic 3	classifier	training	network	set	error	classification	tree	data	problem	neural
Topic 4	network	function	neural	input	weight	number	threshold	unit	training	set
Topic 5	model	learning	system	control	movement	network	motor	eye	position	input
Topic 6	component	model	algorithm	data	function	learning	signal	independent	ica	matrix
Topic 7	network	word	input	learning	cell	neural	system	set	training	unit
Topic 8	circuit	system	function	current	voltage	algorithm	output	weight	transistor	analog
Topic 9	network	unit	input	learning	training	output	neural	weight	set	layer
Topic 10	error	network	weight	learning	training	set	function	generalization	input	data
Topic 11	network	character	system	function	neural	set	input	hand	algorithm	field
Topic 12	motion	model	cell	image	direction	input	field	visual	system	output
Topic 13	model	network	function	system	neural	data	neuron	noise	set	algorithm
Topic 14	network	function	neural	input	set	model	graph	stress	level	system
Topic 15	network	system	neural	model	signal	sound	analog	set	speech	input
Topic 16	network	learning	algorithm	function	model	neural	data	problem	set	training
Topic 17	network	neural	input	pattern	training	output	data	set	layer	weight
Topic 18	model	data	algorithm	document	system	motor	set	learning	tree	function
Topic 19	model	network	data	set	image	training	vector	learning	algorithm	input
Topic 20	neuron	input	network	neural	system	circuit	model	output	signal	current
Topic 21	algorithm	function	set	learning	network	bound	distribution	error	training	number
Topic 22	model	cell	network	neuron	input	pattern	unit	activity	system	function
Topic 23	model	data	network	function	set	input	learning	parameter	neural	algorithm
Topic 24	motion	direction	unit	stage	transparent	model	moving	mae	adaptation	inhibition
Topic 25	network	unit	input	learning	field	model	function	output	layer	weight
Topic 26	part	processing	signal	speech	handwriting	vii	visual	navigation	control	planning
Topic 27	david	michael	john	richard	peter	index	author	thomas	eric	paul
Topic 28	neuron	cell	model	input	firing	spike	visual	synaptic	response	network
Topic 29	network	neural	learning	function	unit	weight	system	input	neuron	problem
Topic 30	learning	action	function	algorithm	model	policy	control	problem	system	reinforcement