

Parsey McParseface

buzz words:

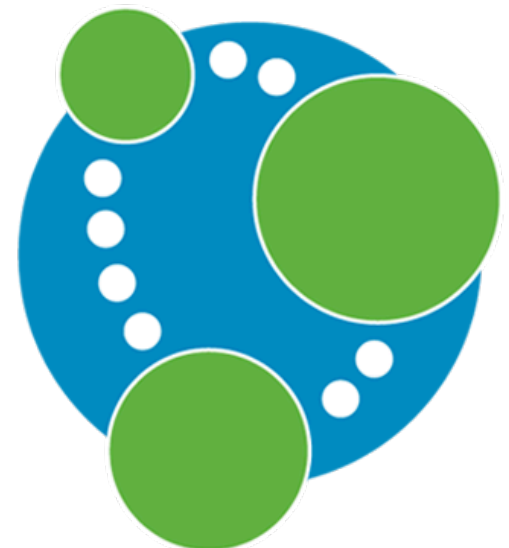
natural language processing

deep learning

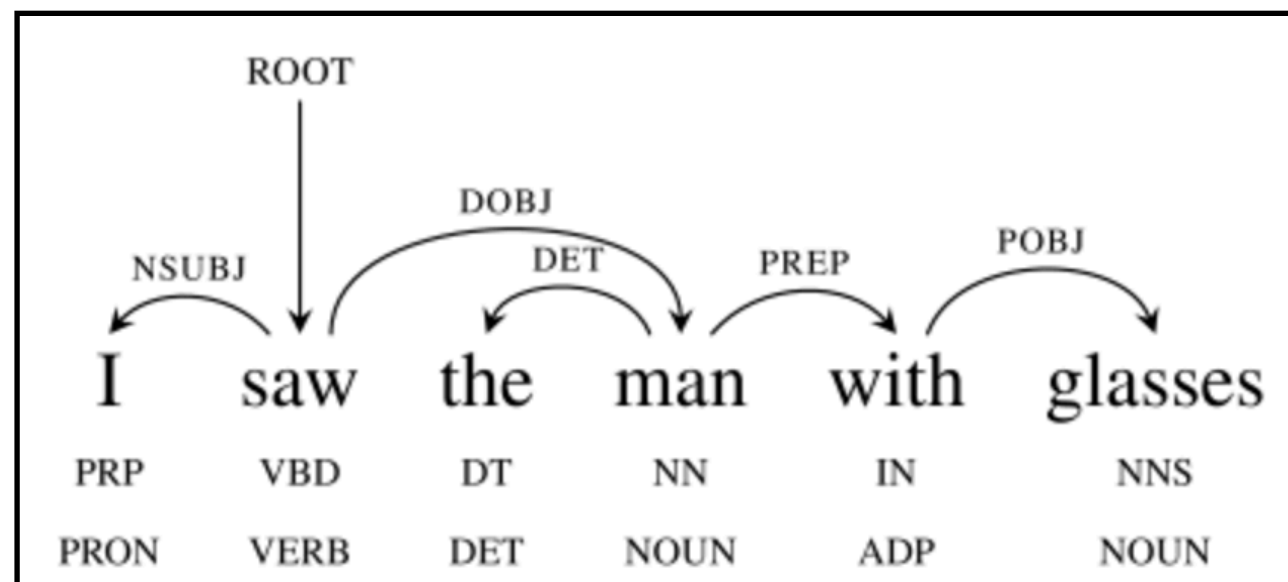
tensorflow

graph database

neo4j



- Tensorflow
 - deep learning framework (dev by Google)
- SyntaxNet*
 - natural language pos tagger/parser
 - built using tensorflow
- Parsey McParseface
 - pre-trained SyntaxNet tagger/parser



*more in depth info at git repo: <https://github.com/tensorflow/models/tree/master/syntaxnet>

Little Red Riding Hood




- Input
 - txt file with one sentence per line

Once upon a time, there was a little girl who lived in a village near the forest.

Whenever she went out, the little girl wore a red riding cloak, so everyone in the village called her Little Red Riding Hood.

- Output
 - conll table* for each line (sentence) in input file

word_id	token	cpostag	postag	head	deprel	deps
1	Once	ADV	RB	2	advmod	1:advmod 2:prep
2	upon	ADP	IN	7	prep	2:prep 7:ROOT
3	a	DET	DT	4	det	3:det 4:pobj
4	time	NOUN	NN	2	pobj	4:pobj 2:prep
5	,	.	,	7	punct	5:punct 7:ROOT
6	there	DET	EX	7	expl	6:expl 7:ROOT
 7	was	VERB	VBD	0	ROOT	7:ROOT 0:NA

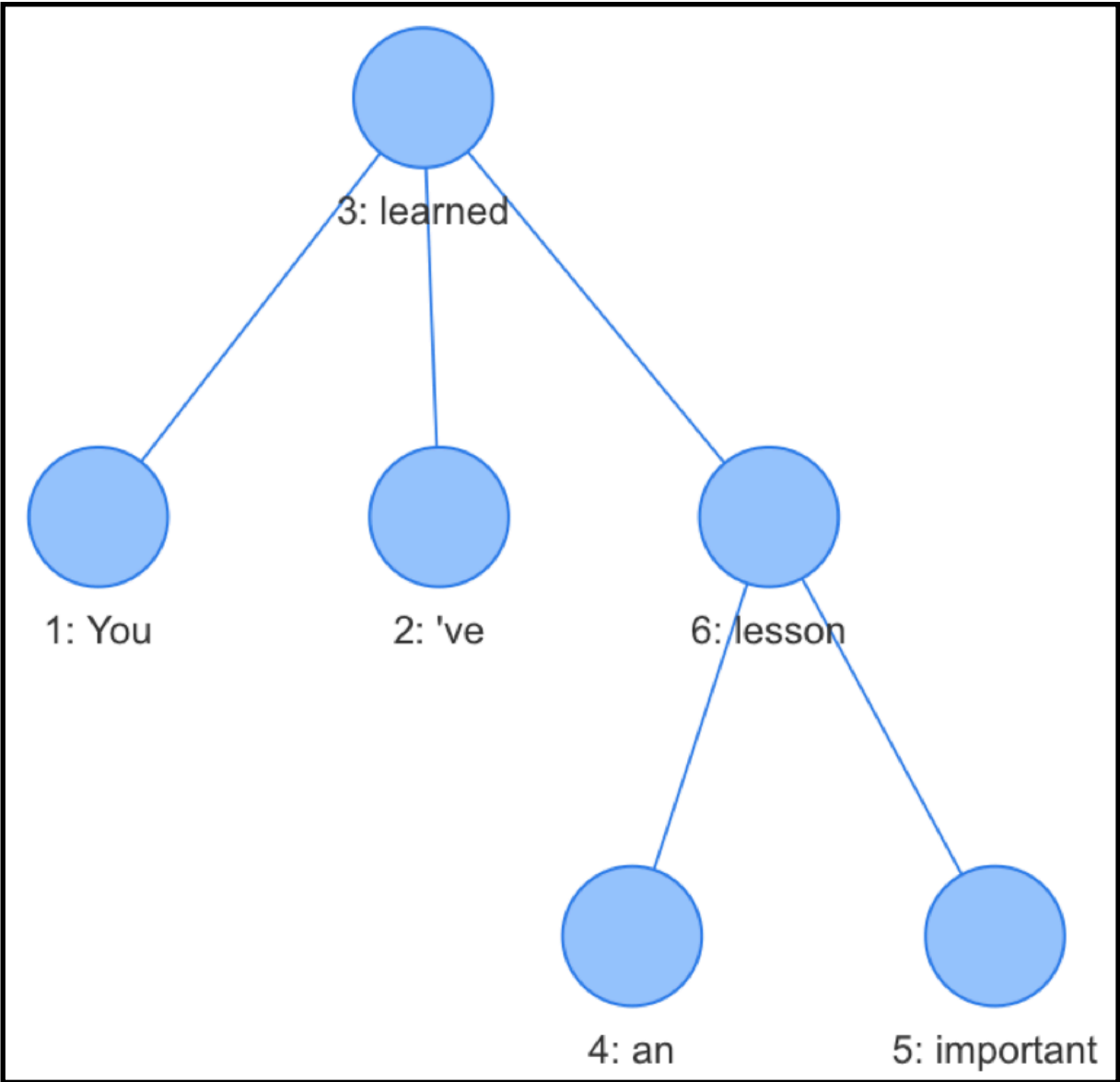
created in R from
id, head, & deprel

*more on conll table format: <http://universaldependencies.org/format.html>

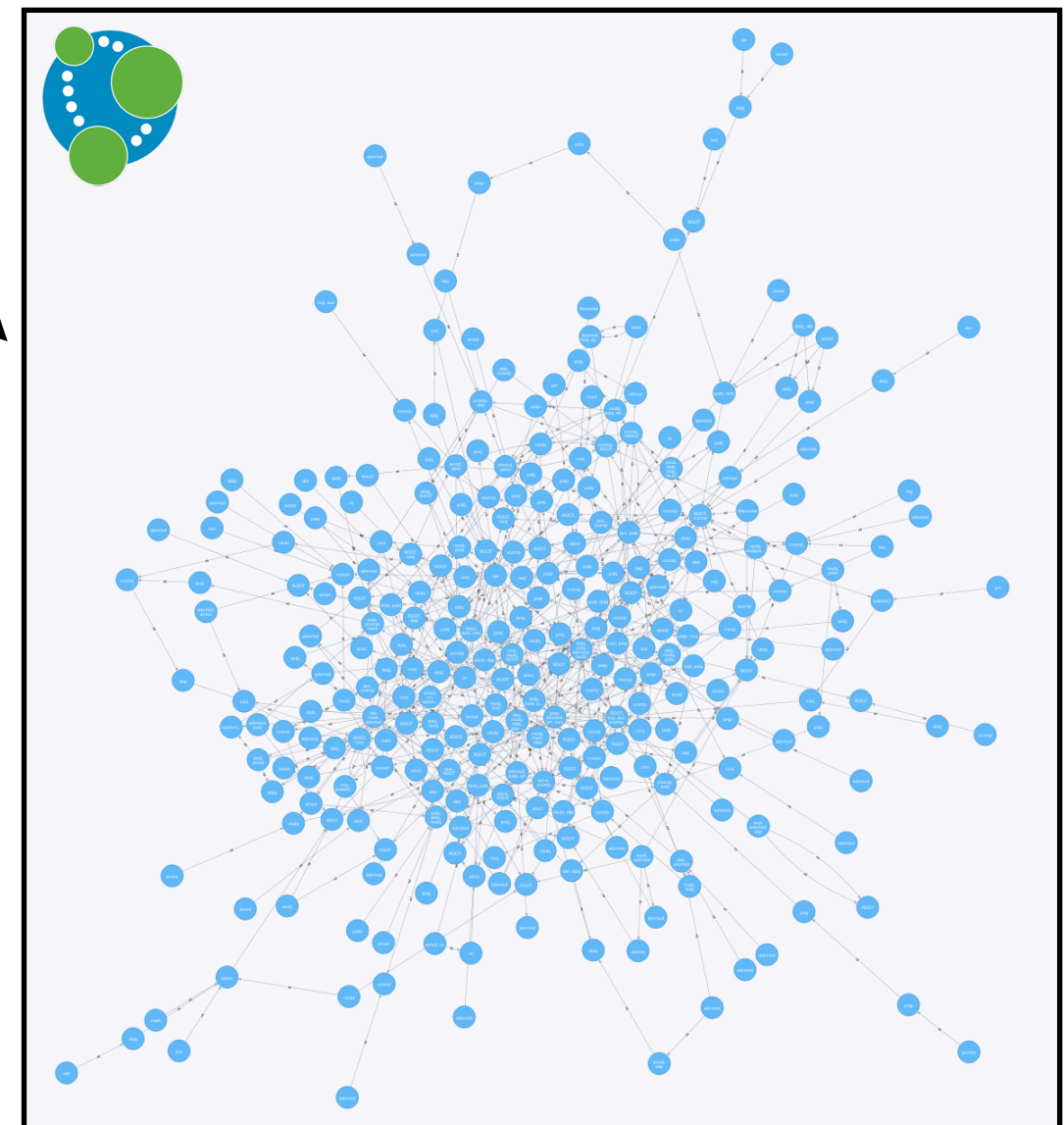
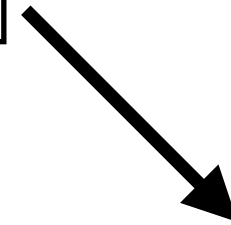
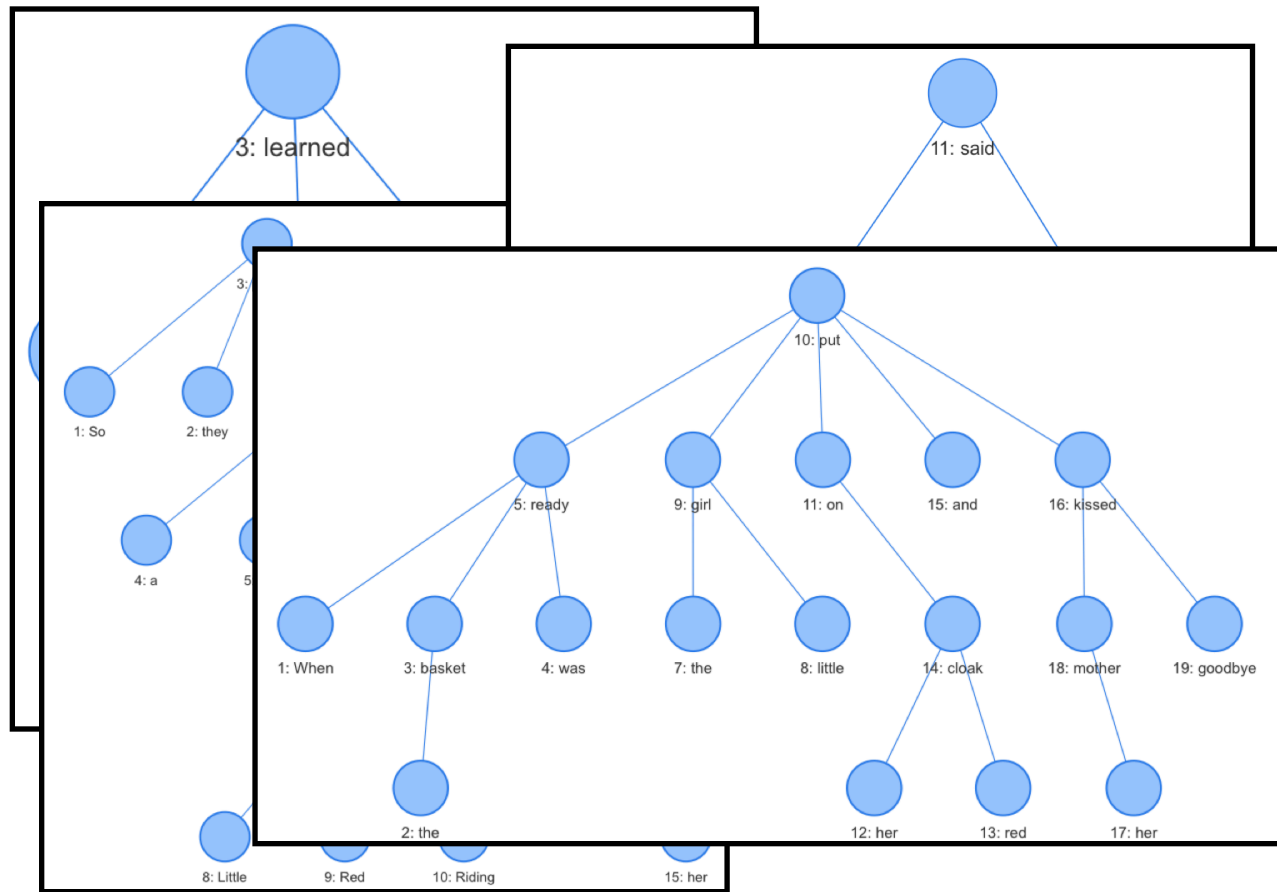
Parsey McParseface: example

word_id	token	cpostag	postag	head	deprel	deps
1	You	PRON	PRP	3	nsubj	1:nsubj 3:ROOT
2	've	VERB	VBP	3	aux	2:aux 3:ROOT
3	learned	VERB	VRN	0	ROOT	3:ROOT 0:NA
4	an	DET	DT	6	det	4:det 6:dobj
5	important	ADJ	JJ	6	amod	5:amod 6:dobj
6	lesson	NOUN	NN	3	dobj	6:dobj 3:ROOT
7	.	.	.	3	punct	7:punct 3:ROOT

- From conll table we can graph word relationships




Parsey McParseface: example



- graph model can extend to model of document/corpus
- corpus can now be loaded into neo4j to be queried

Quantity and Context with Cypher

```
MATCH (q)-[r1]->(a)
WHERE q.cpostags =~ '(?i).*(?:\\W|^)NUM(?:\\W|$).*'
      AND a.cpostags =~ '(?i).*(?:\\W|^)NOUN(?:\\W|$).*'
RETURN q.name as quant, a.name as of_what
```



quant	of_what
one	piece
one	morning

in context

He grabbed the wolf and made him spit out the poor
Grandmother who was a bit frazzled by the whole experience
, but still in **one piece**.

One morning, Little Red Riding Hood asked her mother if
she could go to visit her grandmother as it had been
awhile since they'd seen each other.

What did what to what?

```
MATCH (s)-[r1]-(v)-[r2]-(d)
WHERE s.deprels =~ '(?i).*(?:\\W|^)nsubj(?:\\W|$).*'
      AND v.cpostags =~ '(?i).*(?:\\W|^)VERB(?:\\W|$).*'
      AND d.deprels =~ '(?i).*(?:\\W|^)doobj(?:\\W|$).*'
      AND r1.sent_ids = r2.sent_ids
RETURN s.name as subject, v.name as verbed, d.name as object
```



subject	verbed	object
hood	entered	cottage
you	have	ears
you	have	eyes
grandmother	have	eyes
she	picked	few
hood	notice	flowers

in context

When Little Red Riding Hood entered the little cottage, she could scarcely recognize her Grandmother.

end