

1 Neural Transition-Based Dependency Parsing

1.b

Stack	Buffer	New dependency	Transition
[ROOT]	[I, parsed, this, sentence, correctly]		Initial configuration
[ROOT, I]	[parsed, this, sentence, correctly]		SHIFT
[ROOT, I, parsed]	[this, sentence, correctly]		SHIFT
[ROOT, parsed]	[this, sentence, correctly]	parsed \rightarrow I	LEFT-ARC

The rest of the table:

Stack	Buffer	New dependency	Transition
[ROOT, parsed, this]	[sentence, correctly]		SHIFT
[ROOT, parsed, this, sentence]	[correctly]		SHIFT
[ROOT, parsed, sentence]	[correctly]	sentence \rightarrow this	LEFT-ARC
[ROOT, parsed]	[correctly]	parsed \rightarrow sentence	RIGHT-ARC
[ROOT, parsed, correctly]	[]		SHIFT
[ROOT, parsed]	[]	parsed \rightarrow correctly	RIGHT-ARC
[ROOT]	[]	ROOT \rightarrow parsed	RIGHT-ARC

1.c

A sentence containing n words will be parsed in $2n$ steps. Each word has to be inserted into the Stack (using the SHIFT rule). Also, the stack at the end containing only 1 element (the tree ROOT), and the [Left-ARC, RIGHT-ARC] rules reduce $\#(\text{stack elements})$ by 1. Therefore, there will be applied n SHIFT rules and n ARC rules, meaning $2n$ rules.

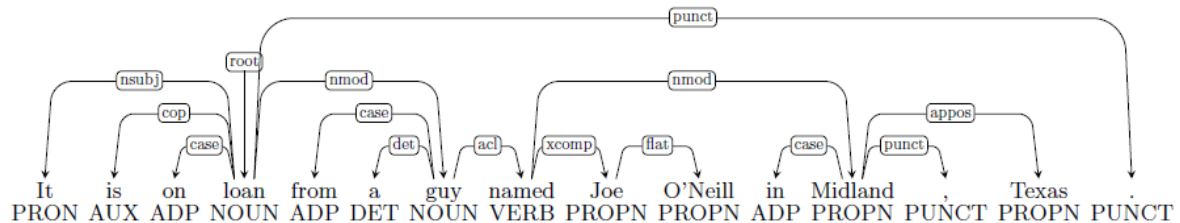
1.g

UAS dev set: 88.62

UAS test set: 88.61

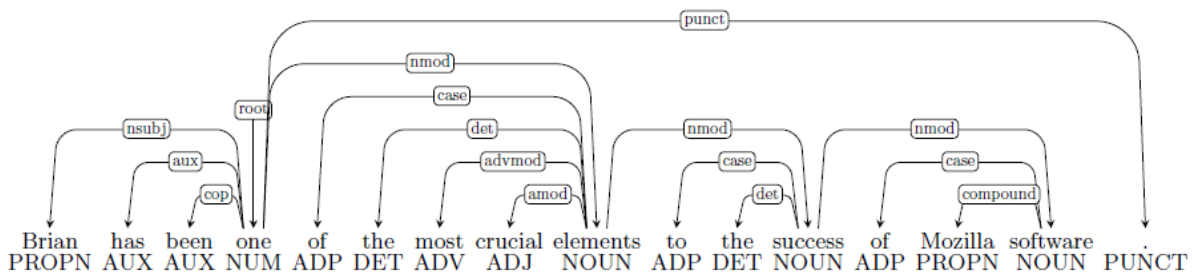
1.h

1.h.i



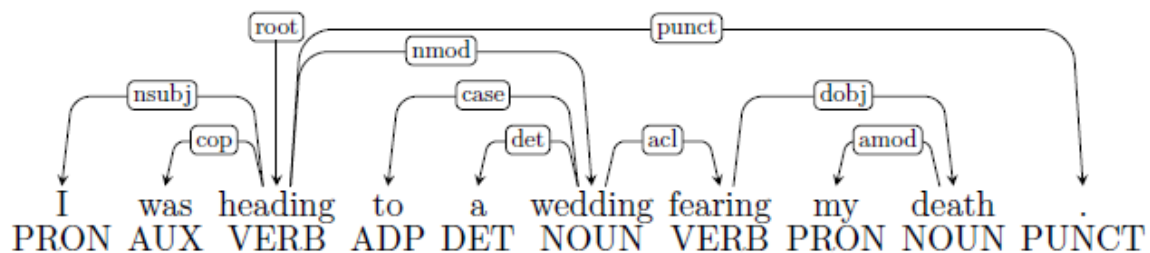
- Error type: Prepositional Phrase Attachment Error
- Incorrect dependency: named \rightarrow Midland
- Correct dependency: guy \rightarrow Midland

1.h.ii



- Error type: Modifier Attachment Error
- Incorrect dependency: elements \rightarrow most
- Correct dependency: crucial \rightarrow most

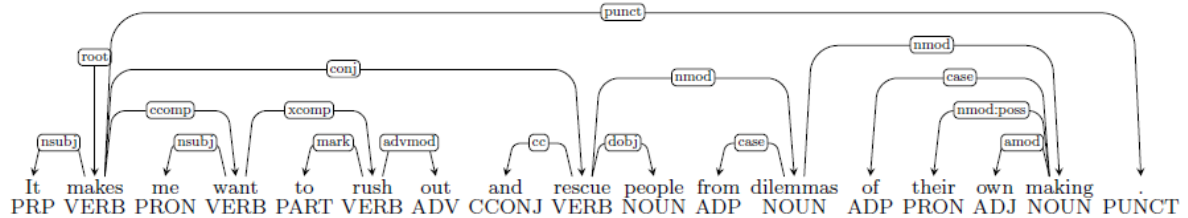
1.h.iii



- Error type: Verb Phrase Attachment Error

- Incorrect dependency: wedding \rightarrow fearing
- Correct dependency: heading \rightarrow fearing

1.h.iv



- Error type: Coordination Attachment Error
- Incorrect dependency: makes \rightarrow rescue
- Correct dependency: rush \rightarrow rescue