SENTENCE PARSING ASSIGNMENT

Suraj Janakiraman

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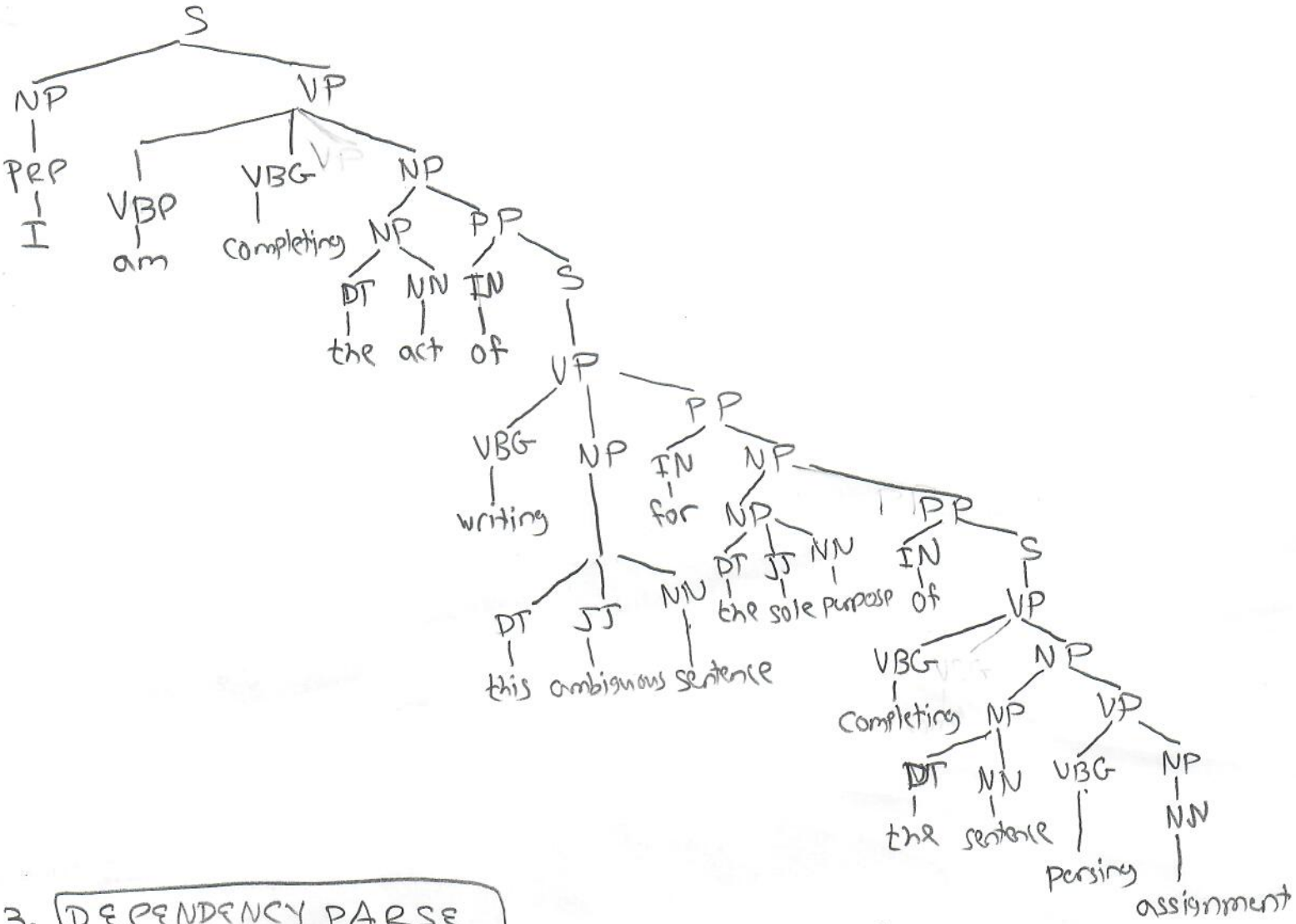
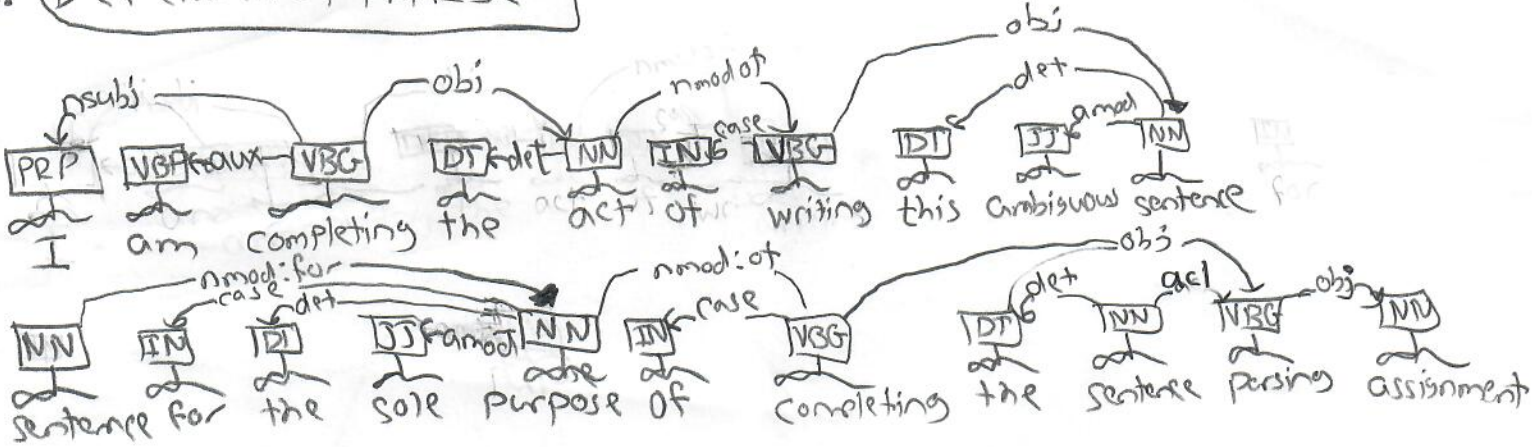
Human Language Technologies CS 4395.001

1. I am completing the act of writing this ambiguous sentence for the sole purpose of completing the sentence parsing assignment.

2. PSG Parse



3. DEPENDENCY PARSE



NOTE:
The word "sentence" has been repeated twice due to lack of space.

NOTE: For problems 2 and 3 the PSG AND DEPENDENCY TREES ARE DRAWN BY HAND.BELOW YOU WILL SEE A PDF WITH THE PARTS OF SPEECH TAGS FOR THE PSG PARSE AND DEPENDENCY RELATIONS.

PROBLEM 4 SHOWS THE SRL PARSE FOR THE SENTENCE AND PROBLEM 5 EXPLAINS THE PROS AND CONS FOR EACH PARSE

2. Terms for the PSG parse:
S- Defined as a simple declarative clause. This clause is not introduced by a subordinating conjunction, nor is this clause introduced by a Wh-word (Wh-adjective, Wh-adverb) that exhibits the property of a predicate preceding the subject also known as subject-verb inversion.
NP- Noun Phrase.
PRP- Personal Pronoun
VP- Verb Phrase
VBP- It refers to a verb not in the 3rd person, singular, and in present tense.
VBG- It refers to the present participle
PP-Prepositional Phrase
IN-Preposition/subordinating conjunction
DT- Determiner (applies to some adjectives. Article adjectives are an example of determiners like the, etc.)
JJ-Adjective that is not a determiner
NN- It refers to a noun that is singular or mass. It is not plural, nor is it a proper noun.

3. Dependency Relationships
Nsubj-Nominal subject. It is a noun phrase which is the subject of a clause. In the dependency parse the nominal subject is governed by a verb, however in some cases, the verb may not govern the nominal subject as the root of the clause in a sentence may be another adjective or a noun.
Aux- auxiliary. This is an auxiliary of a clause. This is the helping/supporting verb of the clause.
Obj- The object of a verb is the second most core argument of a verb occurring after the subject. In an SRL parse, this object may be referred to as the proto-patient or simply (patient).
Det- The determiner of the sentence.
Nmod- This is used for nominal dependents of another noun or noun phrase and corresponds to an attribute or a complement of a noun. In this scenario, nmod is used for the words “for” and “of”
Case: This relation is used for any case-marking element. This is treated as a separate syntactic word (including prepositions, postpositions, and case markers. Case marking elements are to be treated as dependents of the nouns they are attached to.
Amod- Adjectival modifier is an adjectival phrase used to modify the meaning of a noun phrase.
Acl: Acl refers to finite and non-finite clauses that modify a nominal (noun). Acl stands for an adnominal clause and is also described as a clausal modifier of a noun.

4. SRL Parse
Sentence: I am completing the act of writing this ambiguous sentence for the sole purpose of completing the sentence parsing assignment

Key Legend:
Arg0
Predicate
Arg1
Modifier

4. SRL Parse:
Frames for am:
I am completing the act of writing this ambiguous sentence for the sole purpose of completing the sentence parsing assignment

Predicate- am

The predicate am in this scenario does not have any number arguments and modifiers that are related to this predicate.

Frames for completing:
I am completing the act of writing this ambiguous sentence for the sole purpose of completing the sentence parsing assignment

Arg0- I
Predicate- completing
Arg1- the act of writing this ambiguous sentence
PNC- for the sole purpose of completing the sentence parsing assignment

For the predicate completing, the pronoun "I" is the agent performing the action of completing. This is why the pronoun I is Arg 0.

Arg 1 which is "the act of writing this ambiguous sentence" is the object associated with the action of completing. This object Arg1 is NOT related to Arg 0 (I). Arg1 is the Patient.

The modifier in this frame is "for the sole purpose of completing the sentence parsing assignment." This modifier is a PNC. The modifier is the motivation for the Agent "I" completing the act of writing this ambiguous sentence.

Frames for writing:
Predicate- writing
Arg1- this ambiguous sentence

For the predicate writing, Arg1 is the object associated with the predicate. Arg1 is the passive actor which relies on the verb "writing." The argument Arg1 is the patient.

Frames for completing:
I am completing the act of writing this ambiguous sentence for the sole purpose of completing the sentence parsing assignment

Predicate- completing
Arg1- the sentence parsing assignment

For the predicate completing, Arg1 is the object associated with the predicate. Arg1 is the passive actor which relies on the verb "completing." The argument Arg1 is the patient.

Frames for parsing:
I am completing the act of writing this ambiguous sentence for the sole purpose of completing the sentence parsing assignment

Predicate- parsing
Arg1- assignment

For the predicate parsing, Arg1 is the object associated with the predicate. Arg1 is the passive actor which relies on the verb "parsing." The argument Arg1 is the patient.

5.

Pros/Cons for PSG/constituency parsing:

Pros: There are several positives for using PSG/constituency parsing with respect to this sentence. First of all, each word has a properly specified Part of Speech (POS) tag. Second, as a sentence introduces new words, there is a higher probability of each new word having a different POS tag. As of right now 10 POS tags were identified in the entire sentence.

Cons: Despite the positives associated with the PSG parse, the negative aspect of a PSG parse involves repeating Parts of Speech tags for different words making it a recursive tree. To execute the PSG for the sample sentence I used, it would take approximately O(2^n) time to execute.

Pros/Cons for Dependency Parse:

Pros: The dependency parse was able to 8 dependency relations. These dependency relations determine the relation from one word associated with a POS (Part of Speech) tag to another word with a different POS (Part of speech tag). The dependency parse makes sure to match the correct dependency relations from one word to another.

Cons: The dependency parse works well for small sentences. Parsing bigger sentences using the dependency parse requires keeping track of all of the dependency relations (in the case of there being multiple nouns in the sentence surrounded by Verbs, adjectives and prepositions on both sides, each noun must be pointed to by the words with POS tags preceding it and each noun must point to words with POS tags succeeding that noun. Each noun may have multiple dependency relations pointing to it and each noun may have dependency relations pointing to other words. Keeping track of all the dependency relations for each word is time consuming.

Pros/Cons for the SRL parse:

Pro/Con: Depending on the verb in the SRL parse, the SRL parse may find the Agent, Patient, or Modifier or it may just find only the Patient. There was only one frame with a Arg0, Arg1, and Modifier. The other frames either had only an Arg1. One of the frames which focused on the helping verb did not include any arguments. The SRL parse helps when the verb is an active verb as opposed to a passive verb.