

Identify the Verb Phrase for Myanmar to English Translation

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Abstract

A variety of Verb Phrase exists in Myanmar Language including Simple Verb Phrase, Compound Verb Phrase and so on. This paper explains the feature of Myanmar Verb Phrase and English Verb Phrase. And then, the system identifies the verb phrase of input sentence. The input sentence of our system is Myanmar Language. To identify the Verb Phrase, the system applies the Rule-Base approach and Backward Maximum Matching approach. The resulting Verb Phrase is generated with their appropriate English meaning. To generate the appropriate English meaning for each Myanmar word, Myanmar to English Bilingual lexicon is used.

1. Introduction

Natural Language Processing (NLP) has been studied for decades. Natural Language Processing (NLP) is a field of computer science and linguistics concerned with the interactions between computers and human (natural) languages. In this field of computational linguistics, some results have already been obtained, however, a number of important research problems have not been solved yet. In this paper, the system will solve the problem of identify the verb phrase of Myanmar input sentence. The structure of Myanmar sentence is subject, object and verb. The structure of English sentence is subject, verb and object. The fact that the object in English follows the verb, while in Myanmar this order is reversed, therefore, source

language separate into phrases such as Noun Phrase and Verb Phrase becomes an essential role in Machine Translation.

The verb is the most important part of the sentence. A verb asserts something about the subject of the sentence and express actions, events, or states of being. Words of actions, events and relations are categorized in verbs. Myanmar verbs always have to match with their subject. They depend on the person, gender, number, and the form of the verb changes. The suffix of the verb will indicate person, number, tense and voice.

The rest paper described as follows: Section 1 described Introduction, Section 2 present Related Work. Section 3 explained about the feature of Myanmar Verbs. Section 4 described about basic sentence pattern of Myanmar and English. Section 5 presented the Position of Verb Phrase. Section 6 presented formation verbs in Myanmar and English. Section Section 7 Explained Identify the verbs phrase by using rule- based approach. Section 8 Presented our proposed system and Section 9 described conclusion.

2. Related Work

A comparison of the two grammatical systems of written English and Myanmar and significant for learning English as a foreign language is presented in [1].the nature and concepts of both written English and Myanmar grammars are investigated to identify probable grammatical difficulties which Myanmar learners to

English can encounter and to explore the implications in learning English as a foreign language.

To solve Noun and Verb agreement in Kannada sentences, a way of producing context free grammar is proposed in [2]. In most of the Indian languages including Kannada a verb ends with a token which indicated the gender of the person (Noun/ Pronoun). The implementation of this agreement using Context Free Grammar is shown. Recursive Descent Parser was used to parse CFG. Around 200 sample sentences had taken to test the agreement.

"Syntactic analysis" or parsing and semantic interpretation is presented in [3]. First stage uses grammatical (syntactic) information to perform some structural preprocessing on the input, to simplify the task of the rules which compute a symbolic representation of the meaning. This preprocessing stage is usually known as parsing, and could be roughly defined as \grouping and libeling the parts of a sentence in a way that displays their relationships to each other in a useful way[3].

The author of [4] proposed a two layer syntax analyzer for analyzing English for English-to-Myanmar machine translation. The main contribution is analyzing English language in Chunk structure, providing required lexical, contextual and functional information for next step to machine translation.

A variety of verb phrases exist in Urdu including simple verb phrases conjunct verb phrases and compound verb phrases is described in [5]. It explains the structure of Urdu verb phrases, automatically tag them. The corpus is then used to develop a hybrid approach using HMM based statistical chunking and correction rules. The technique is enhanced by changing chunking direction and merging chunk and POS tags. Based on the analysis, correction rules are extracted to address the errors.

3. Features Of Myanmar Verbs

There are so many languages all over the world but no two languages are exactly alike. English, like all languages, is full of problems for foreign learners. In the same way, Myanmar has its own system and Myanmar verbs are unique. It is necessary to give an introduction to Myanmar Verbs. By means of this introduction, it may be easy to understand the feature of Myanmar verbs for foreign learners.

Probably the majority of Myanmar verbs are monosyllabic; eg

စား	ရောင်း
sarr	yaung
eat	sell

A few are weak disyllables, i.e, disyllabic with a weak initial syllable.e.g;

သရော်	ကလက်
Thayo	kale
mock	be wanton

Others are polysyllabic. Most polysyllabic verbs are analyzable as made up of two or more verbs in various ways. Polysyllabic verbs which cannot be analyzed may be loan-words; e.g:

ပူဇော်	ဆုံးမ
puzo	hsouma
worship	rebuk

3.1 Compuound Verbs

Compound Verbs contain two or more “members” linked together. Examples of compound verbs containing two members are;

သွားဝယ်	သွား	ဝယ်
Thwawe	thaw	we
go and buy	go	buy
နေထိုင်	နေ	ထိုင်

Nei htain nei htain
Reside stay sit

All other members in compound verbs, i.e those which are neither pre-verb nor auxiliary members, are called ‘ordinary members’ or simply ‘ordinary verbs’; is called an “ordinary compound”

Examples are သွားဝယ် **Thwa we** နေထိုင် **Nei htain** above.

In brief, a member of a compound verb may be either ordinary, pre-verb, or auxiliary, and

Ordinary compound = ordinary member+ ordinary

Member

Pre-verb compound= pre-verb member+ ordinary member

auxiliary compound= ordinary member + auxiliary member

Ordinary compound verbs are most commonly disyllabic; e.g.

yaun we yaun we
ရောင်းဝယ် ရောင်း ဝယ်
Trade sell buy

သွားလာ သွား လာ
Thaw: lar thaw lar
go go come

3.2 Doubled Verbs

Sometimes a disyllabic ordinary compound verb is found, especially in formal or literary contexts, where one of its members alone could have carried the meaning equally well, and in less elevated contexts only one member would normally be used. These are called double verbs. and the additional member is a “doubler”. The presence of the doubler usually results in a more sonorous

and elevated tone stylistically, and in some styles nearly every verb is doubled.

The doubler generally follows the usual verb; e.g:

ပြောဆို ပြော ဆို
pyo hsou pyo hsou
speak ‘id’ ‘id’

ချက်ပြုတ် ချက် ပြုတ်
hce pyou hce pyou
cook ‘id’ ‘id’

3.3 Verbs With Tied Noun

Some verbs, besides occurring alone, are also found closely linked in meaning with a preceding noun in such a way that the whole phrase may be regarded as a single unit of meaning. Noun in this position are called ‘tied nouns’ and the whole phrase is called a “verb with tied-noun verb”

နားထောင် ear + set up on end

Na htaun

Listen

4. Basci Scentences Pattern Mynamr And English

4.1 English verb pattern (1) and Myanmar

“Subj + Verb”

This is the simplest of verb patterns the subject is followed by an intransitive verb, which expresses complete sense without the help of any other words

	Subject	Verb
1	Birds	fly
2	The baby	is crying

Here, the place of the verb is the same in Myanmar. The subject is followed by an intransitive verb, which expresses complete sense without the help of any other words.

	Subject	Verb
1	ငှက်များသည်	ပျံသန်းကြသည်
2	ကလေးသည်	ငိုနေသည်

4.2 English verb pattern (2) and Myanmar

Some of English verbs may be used with a simple direct object which is noun or pronoun.

	Subject	Verb	Object
1	Cats	Catch	Mice
2	The dog	bit	The man

In this pattern, the subject is followed by the transitive verb and the object is after the verb in English.

	Subj	Object	Verb
1	ကြောင်များသည်	ကြွက်များကို	ဖမ်းကြသည်
2	ခွေးသည်	လူကို	ကိုက်ခဲ့သည်

In Myanmar, the subject is followed by the object and the verb is at the end of the sentence.

4.3 English verb pattern(3) and Myanmar

English verbs used in this pattern have two objects, an indirect object followed by a direct object.

	S	V	I.O	D.O
1	He	Gave	Her	a pen
2	She	teaches	us	English

In this pattern, the verb is after the subject and followed by the indirect object in English. In Myanmar, we can learn as follow;

	S	I.O	D.O	V
1	သူသည်	သူမအား	မှင်တံတစ်ခု	ပေးခဲ့သည်
2	သူမသည်	ကျွန်ုပ်အား	အင်္ဂလိပ်စာ	သင်ပေးသည်

The place of the verb is at the end of the sentence and Indirect object is after the subject. Direct object is before the verb here.

5. Position Of Verb

(1) Position of Verbs in Myanmar

S + O → V

e.g. မောင်မောင်ကားတစ်စီးဝယ်ခဲ့သည်။

Position of Verbs in English

S → V ← O

e.g. Mg Mg bought a car.

(2) Position of Verbs in Myanmar

V ← postp

e.g. ပေးသည် (give), ပေး၏ (give), ပေးပြီ (give)

Position of Verbs in English

prep → verb (Infinitive)

e.g. to plan, to write, to cook

(3) Position of Verbs in Myanmar

V ← aux + postp

e.g. ယူနိုင်သည် (can take), သယ်လိမ့်မည် (will carry),

ဆွေးနွေးနိုင်သည် (can discuss)

Position of Verbs in English

aux → V

e.g. can take, will bring, may discuss.

(4) Position of Verbs in Myanmar

Negative prt → V

e.g. ဆေးလိပ်မသောက်ရ။

Position of Verbs in English

Negative prt → V / n / adj

e.g. Do not smoke, No smoking, unhappy

6. Formation Of Verbs In Myanmar And English

The following ways show how English verbs are formed.

(a) An adjective and a verb can be combined to form a compound verb in English.

adv + V = Compound V

e.g. over + come = overcome

(b) A noun and a verb can be combined to form a compound verb in English.

n + V = Compound V

e.g. house + keep = housekeep

(c) Two verbs can be joined together to form a compound verb in English.

V + V = Compound V

e.g. dare + say = daresay

As for the formation of verbs, the following ways show how **Myanmar verbs** are formed.

(a) An adjective and a verb can be combined to form a compound verb in Myanmar.

n + V = Compound V

e.g. နှုတ်ခွန်း + ဆက်သ = နှုတ်ခွန်းဆက်သ

spoken word + offer respectfully = greet

(b) A noun and two verbs can be combined to form a compound verb in Myanmar.

n + V + V = Compound V

e.g. စကား + နိုင် + လု = စကားနိုင်လု

speech + win + take by force = try to get the last word in an argument

(c) Two nouns and two verbs can be combined to form a compound verb in Myanmar.

n + n + V + V = Compound V

e.g. စကား + လက် + ဆုံ + ကျ = စကားလက်ဆုံကျ

speech + hand + coincide + fall = be absorbed in conversation

n + V + n + V = Compound V

e.g. မြေ + စမ်း + ခရမ်း + ပျိုး = မြေစမ်းခရမ်းပျိုး

soil + test + egg -plant + sow = try out an undertaking

7. Identify The Verb-Phrase By Using Rule-Base

To identify the Verb Phrase, rule- based system is used.

Eg. ဦးဘသည် ခွေးကိုတုတ်ဖြင့် ရိုက်သည်။

In this sentence "ဦးဘသည်" is consider as Noun Phrase.

and "ခွေးကိုတုတ်ဖြင့်ရိုက်သည်" is define as verb- phrase.

Our system consider only Verb Phrase. In these sentence Verb Phrase, that are combine with other phrases, such as ခွေးကို(ကံပုဒ်) prep (obj) + တုတ်ဖြင့် (အသုံးခံပြပုဒ်) prep (accustation) + ရိုက်သည် (ကြိယာပုဒ်) prep (verb).

Examples of these rules are as follows:

(1) Verb Phrase → Prep (place) + Prep (reason) + Prep (verb).

Verb Phrase → နေရာပြပုဒ် + အကြောင်းပြပုဒ်+ ကြိယာပုဒ်

(2) Verb Phrase → Prep (obj) + Prep (accusation) + Prep (verb).

Verb Phrase → ကံပုဒ်+ အသုံးခံပြပုဒ်+ ကြိယာပုဒ်

(3) Verb Phrase → Prep (place) + Prep (verb).

Verb Phrase → နေရာပြပုဒ်+ ကြိယာပုဒ်

(4) Verb Phrase → Prep (obj) + Prep (intention) + Prep (Verb).

Verb Phrase → ကံပုဒ်+ ရည်စူးချက်ပြပုဒ်+ ကြိယာပုဒ်

(5) Verb Phrase → Prep (obj) + Prep (Verb).

Verb Phrase → ကံပုဒ်+ ကြိယာပုဒ်

(6) Verb Phrase → Prep (obj) + Prep (direction) + Prep (Verb).

Verb Phrase → ကံပုဒ်+ ရှေးရှုရာပြပုဒ် + ကြိယာပုဒ်

(7) Verb Phrase → Prep (time) + Prep (place)+ Prep (Verb).

Verb Phrase → အချိန်ပြပုဒ်+ နေရာပြပုဒ်+ ကြိယာပုဒ်

(8) Verb Phrase → Prep (time) + Prep (obj) + Prep (Verb).

Verb Phrase → အချိန်ပြပုဒ်+ ကံပုဒ်+ ကြိယာပုဒ်

(9) Verb Phrase → Prep (accusation) + Prep (obj) + Prep (Verb).

Verb Phrase → အသုံးခံပြုပုဒ်+ ကံပုဒ်+ကြိယာပုဒ်

(10) Verb Phrase → Prep (place) + Prep (obj)+ Prep (Verb).

Verb Phrase → နေရာပြုပုဒ်+ ကံပုဒ်+ ကြိယာပုဒ်

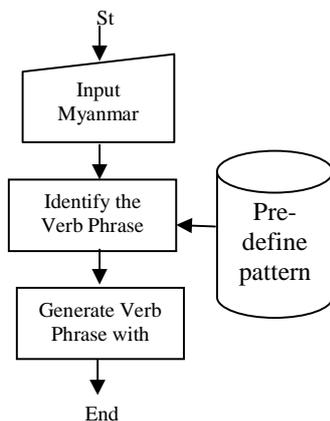
(11) Verb Phrase → Prep (intention) + Prep (Verb).

Verb Phrase → ရည်စူးချက်ပြုပုဒ်+ ကြိယာပုဒ်

8. Proposed System

In this system, Myanmar word with their appropriate part of speech (POS) tags is accepted as input. Although Myanmar language is ordered left to right, we consider right to left backward word maximum matching is used since the translation system is sentence level. The process of the system have four steps:

- Step 1: accept the input sentence with Myanmar POS.
- Step 2: starting from the end point, verb patterns are created by using right to left approach.
- Step 3: If the generated pattern is matches with the verb patterns that are defined previously, the system produces the verb phrase by using rule-base approach.
- Step 4: finally, the system outputs the verb phrase with appropriate English meaning for each Myanmar word.



9. Conclusion And Future Work

Myanmar sentence has at least one Noun Phrase and one Verb Phrase. This system identifies only the Verb Phrase. Given a sentence, the system says whether the sentence is syntactically correct or wrong depending upon the Noun Phrase and Verb Phrase. As a future improvement, the classification method for semantic verb phrase of Myanmar Language will be implemented. The resulting system will help the application of Myanmar to English language translation.

Reference

- [1] A. Z. Min, *A Comparative study of the two grammatical systems of written English and Myanmar and its significance to learning English as a foreign language*, University of Mandalay, May 2007.
- [2] B.M.Sagar, et al "Solving the Noun Phrase and Verb Phrase Agreement in Kanada Sentences" *International Journal of Computer Theory and Engineering*, Vol.1 No.3, August, 2009
- [3] C.Mellish et al "The Grammatical Analysis of Sentences."
- [4] M.T.Z.Tun "An English Syntaz Analyzer for English-To-Myanmar Machine Translation".
- [5] W.A.Sarmad Hussain "A hybrid approach to Urdu Verb Phrase Chunking.
- [6] J.Okeli, a.Allot, "Burmese/Myanmar dictionary of grammatical forms".
- [7] နှစ်သုံးဆယ်ပြည့် မြန်မာ့သဒ္ဒါ/ မြန်မာစကား