LING 120:

Language and Computers

Semester: Fall '17

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Outline

- General Announcements
- Discussion about previous exercise
- Plan for this week:
 - Machine Translation: introduction (today and wednesday)
 - ► Friday: General discussion about different applications, impact of these on our life etc.
 - How does Machine Translation work? (after the break)
- Exercise about Machine Translation

General Announcements

General Stuff

- ▶ **Reminder:** Assignment 6 due this week!
- ▶ Revision topics: no one posted anything
- ▶ But I was reading about representing Sign Language and Braille on computer over the weekend may be I will try to know more and talk about this after the break.

Grade improvement: oral exam timings

People wanting grade improvement, choose one of the following timings and get back:

- 4th December: 1-2 pm, 5-5:30 pm. 6th December: 1-2pm,
 5-5:30 pm. 8th December: 1-2 pm.
- Choose a time (actual oral exam will only take 15 min), choose any 3 topics from the course, and send me an email.
- Show up at the time you promised to come, and I will pick one (or two) of the three topics and ask questions.
- ► Maximum improvement: 5% (I am flexible if you do extraordinarily well)

Final Exam: Recap of description

- Carries: 20% of your grade, and involves writing 2 short essays.
- Has to be submitted in three parts:
 - 1. Write a part of the assignment (one question) and submit by 2nd December 5%
 - Do an in-class peer review of one of your classmate's work (6th December) - 5% - if you don't come to class, you don't get graded for this part.
 - 3. Final submission (of both the questions) 10%
- Exact details about word limits, how to submit and list of topics for questions are on Canvas.

Final Exam- Questions?

- I am hoping you read through the requirements and expectations
- ▶ I am also hoping you now know the deadlines
- Any questions on finals?

Discussion of Last Class Exercise

Attendance Exercise From Last Class

Running on MT -

http://nacloweb.org/resources/problems/2011/A.pdf

Solution:

- Looking for words that seem out of place
- Thinking about synonyms of those words that fit in the context.
- ► Full list: http://nacloweb.org/resources/problems/ 2011/naclo11r1_sol.pdf

Nellie on Speech-Speech Translation in Skype

Intro to Machine Translation

Is translation easy for humans?

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- ► For humans:
 - What is possibly easy to translate?

Questions, questions, questions!

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- ► For humans:
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 - What is possibly difficult to translate?
 - What do you think is impossible to translate?

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- How do we evaluate human translation?

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- What are the applications of machine translation?
- How do we evaluate human translation?
- ▶ How do we evaluate machine translation?

Let us talk about Human Translation first

Can 2–3 people who can speak/read/write in another language come forward and translate the following sentence:

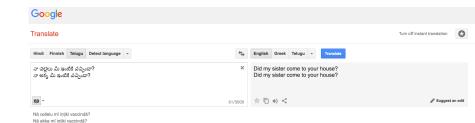
Why do we need machine translation?

Machine Translation today - Example 1

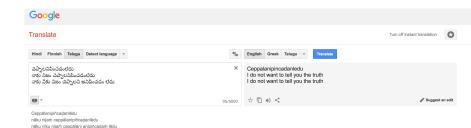
I want to use this example to illustrate the issues in translating from English to Telugu automatically.

ఇంగ్లిష్ నుండే తెలుగు బాషకు అనువాదములోని సమస్యలను ఉదహరించడానికి నేను ఈ ఉదాహరణను ఉపయోగించాలనుకుంటున్నాను.

Machine Translation today- Example 2



Machine Translation today- Example 3



So, what are the issues?

- From last class, we also know: Each word can have multiple meanings, so mapping words one-one between languages is not possible.
- From today's examples, we know there are several other issues such as:
 - How words are formed between languages
 - What is the order of words
 - Words that don't seem to translate
 - Words that seem to come up in translation that do not exist in original
 - ► Issues such as: articles don't exist in Telugu, but they do in English. Kinship words are more fine grained in Telugu than English etc.

Other Issues

- Stylistic and cultural differences which can make even manual translation difficult
- Metaphor is even difficult same metaphors need not exist in both languages
- Poetry with rhyme what if those words don't rhyme in Target language?

Different Scenarios for Machine Translation

- Tasks where rough translation is adequate (e.g., doing a web search)
- ➤ Tasks where a human post-editor is used (e.g., computer aided human translation, to reduce effort for human translators, in scenarios like creating multi-lingual interfaces to Windows, Facebook etc)
- ► Tasks within a restricted domain, which need high quality translation (e.g., Weather forecasting)

Today's Attendance Exercise

In this course so far, where is the idea of n-grams useful among the topics we discussed? Do you think they are useful in Machine Translation too?

Just an FYI: our main topics were - text and speech input, spelling and grammar correction, tutoring systems, search, text classification, dialog systems, speech recognition and synthesis.