ASEAN Language Speech Translation thru' U-STAR

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Indonesia

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Project Members

Name	Organization	Country
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Hammam Riza	Deputy Chairman IT, Energy and Material, BPPT	Indonesia
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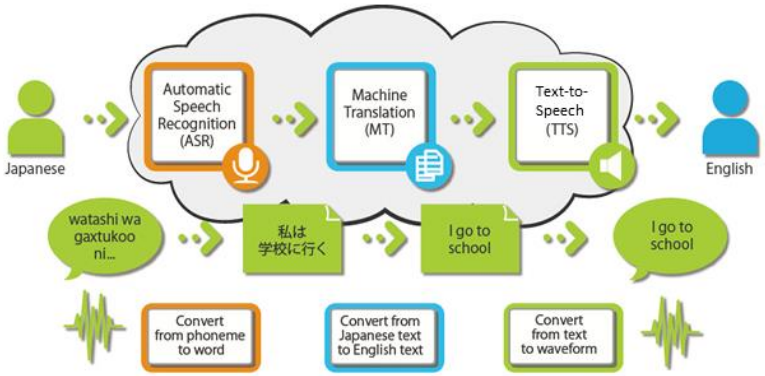
Project Introduction

To provide a single and unified platform for multilingual communications across the ASEAN nations through U-STAR

To collaborate and facilitate the development of speech translation technologies, language resources and translation app for ASEAN languages



Duration

1st July 2016 to 30th June 2019

Target

- An integrated speech translation service for the ASEAN community.
- A common ASEAN speech translation evaluation language resource for ASEAN speech translation system evaluation

Universal Speech Translation Advanced Research

http://www.ustar-

Language Localization

Organization	Country	Language
NIPTICT	Cambodia	Khmer
BPPT	Indonesia	Bahasa Indonesia
UTM	Malaysia	Bahasa Melayu
UCSY	Myanmar	Myanmar
I^2R	Singapore	Chinese
NECTEC	Thailand	Thai
HUST	Vietnam	Vietnamese
IOIT	Vietnam	Vietnamese

ASEAN Speech Translation Data Collection Guidelines

Data Specifications

- Content of utterances: should be common and appropriate for general use and reflect a variety of practical situations

- Target Speakers: as many speakers as possible and well distributed across the ages 15-75 years (minimum of 5 male speakers and 5 female speakers)

- Speaking style and environment: fluent expressions, and these should be read naturally and fluently by the speakers (no fillers, hesitations, and long pauses are recorded)

Transcription & Translation Specifications

- Transcription of Numbers, Acronyms, Foreign words and names
- Punctuation Insertion & Translation of Number: as natural as possible (e..g phone number:12345678)
- Translation or Transliteration: always translate unless no English equivalent.

Current Status of ASEAN Speech Translation Data Collection

Organization	Country	Language	Status
NIPTICT	Cambodia	Khmer	• 10K utterances collected and translated • 4K utterances selected to record as a voice date. Recording in progress.
BPPT	Indonesia	Bahasa Indonesia	• 5000 utterances collected, translated and recorded
UTM	Malaysia	Bahasa Melayu	• 5000 utterances have been collected and translated. • Recording of 5000 utterances in progress (completed 8 subjects – 5000 utterances each)
UCSY	Myanmar	Myanmar	• 4000 utterances collected and translated. • Recording of 2000 utterances in progress.
I^2R	Singapore	Chinese	• 5000 utterances collected, translated and recorded
HUST	Vietnam	Vietnamese	• 6,500 Vietnamese text utterances collected • 3,000 Parallel text utterances • 1,200 recorded utterances (Vietnamese)
IOIT	Vietnam	Vietnamese	• 2000 utterances collected and recorded
NECTEC	Thailand	Thai	• 6000 utterances have been collected, translated, and NE annotated • 70% recording progress

Audio Data Information Details

Organization	Device	Format	Speaker
UTM	• Samsung • iPhone	• 16KHz,16 bit rate, mono	• 4 male speakers • 5 female speakers
UCSY	• TASCAM DR-100MKIII	• 16KHz, 16 bit rate, mono	• 20 speakers
I^2R	• iPhone	• 16KHz,16 bit rate, mono	• 4 male speakers • 2 female speakers
HUST	• Recording tool (MySpeechRecord) • Samsung Galaxy A5 Apple iPhone 6s	• 16KHz,16 bit rate, mono	• 4 speakers
IOIT	• desktop computer	• 8KHz, 16bit, mono and pcm encoded • normal room environment	• 4 male speakers • 4 female speakers
NECTEC	• Apple iPhone via a specifically developed App	• 16 kHz, 16 bits, mono • PCM WAV • Quiet environment	• 12 male speakers • 12 female speakers

Syllable-based Recurrent Neural Network for Myanmar Word Segmentation

Hsu Myat Mo, UCSY
Zhou Nina, Aw Ai Ti, I2R

Background

- Myanmar scripts are written continuously as a sequence of characters without any delimiter between words.
- Word is formed by characters and syllables with certain rules.

Method

- Existing methods use dictionary, rule, traditional machine learning approaches e.g., HMM or CRF.
- Investigate syllable-based segmentation scheme and use BLSTM for sequential labelling

Unsegmented sentence: အတိတ်မှသင်ခန်းစာသည်အနာဂတ်ရဲ့အားအင်။

Syllable-based segmented sentence: |အ/Bတိတ်/Iမှ/B|သင်/Bခန်း/Iစာ/I|သည်/B|အ/Bနာ/Iဂတ်/I|ရဲ့/B|အား/Bအင်/I။/B|

Data

#	Sent.	Word	Syllable	Char
Train	47K	1.0M	1.6M	4.785M
Dev.	2K	46,500	59,296	151,447
Test	2K	38,000	60,004	226,583

CRF Method

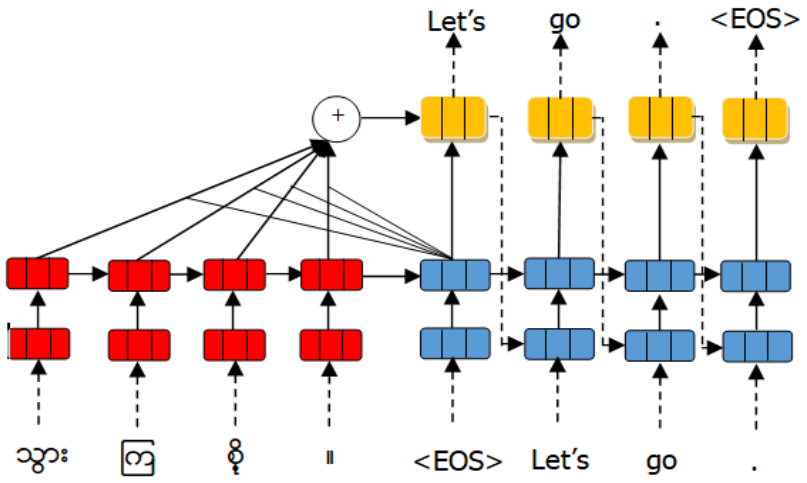
CRF (Dev.)	Prec	Recall	F1-score
Char-based	94.03	93.93	93.98
Syllable-based	93.90	94.08	93.99

BLSTM Method

Models		Precision / Recall / F1-score	
		Dev.	Test
BiLSTM (SGD)	Char	89.40/ 88.48 / 88.94	81.67/ 84.13 / 82.88
	Syllable	93.67 / 94.0 / 93.83	92.73/ 92.40 / 92.56
BiLSTM-CRF (SGD)	Char	88.23/ 87.35 / 87.79	82.32/ 83.04 / 82.68
	Syllable	92.03/ 93.59 / 92.80	91.20/ 91.90 / 91.55

Myanmar-to-English Syllable-based Neural Machine Translation System

Yi Mon Shwe Sin, UCSY
Wu Kui, Aw Ai Ti, I2R



- Word level neural machine translation (NMT) cannot model rare words in translating languages with rich morphology. Therefore, a syllable-based NMT is presented by segmenting the source sentences at syllable level using a Myanmar syllable segmenter
- Syllable-based NMT cannot translate unknown words well and a Name Entity database is incorporated to improve name entity translation

System	BLEU
Word-based NMT	21.88
Character-based NMT	20.71
Syllable-based NMT	26.50
Syllable-based NMT+ NE-database	27.94

Myanmar-English	Parallel Sentences
Original Corpus	228,767
NE-database	27,024
Total	255,791


Thank
You!