

Conversational multilingual translator for interpreters

(Neural machine translation)

2023.10.12

Presenter: Seonhui, Kim



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Introduction

01. Introduction

What is a Conversational Translator?

Normal Translator

안녕하세요, 저는 김선희입니다.



Hello, I'm Kim Seonhui

Conversational Translator



안녕하세요 저는 김선희입니다



Hello, I'm Kim Seonhui

01. Introduction

What is a Conversational Translator?

< English >

Because you're all plans and
clockworks

I just got outsmarted by Mr.Potato
Head.

Even though it's once in a blue
moon, there are these moments...
Moments?

So we're just gonna bite the bullet and
just do it.

< Korean >

왜냐면 너희들은 모두 계획이고 시계공이니까.

나는 방금 Mr.Potato head에게 졌다.

한 번쯤은 청천벽력이지만,
이런 순간들이 있습니다.. 순간들?

그래서 우리는 그냥 총알을 물고 그냥 할거야.



Literal
translation

01. Introduction

What is a Conversational Translator

< English >

Because you're **all plans and clockworks**

I just got outsmarted by Mr.**Potato Head.**

Even though it's **once in a blue moon**, there are these moments...
Moments?

So we're just gonna **bite the bullet** and just do it.

< Korean >

당신은 모든게 **계획대로 순조롭게** 진행되어야하잖아

나는 저 **꿀통**에서 당했어.

아주 가끔이지만 순간 순간

그래서 **울며 겨자 먹기**로 당장 해치우려고



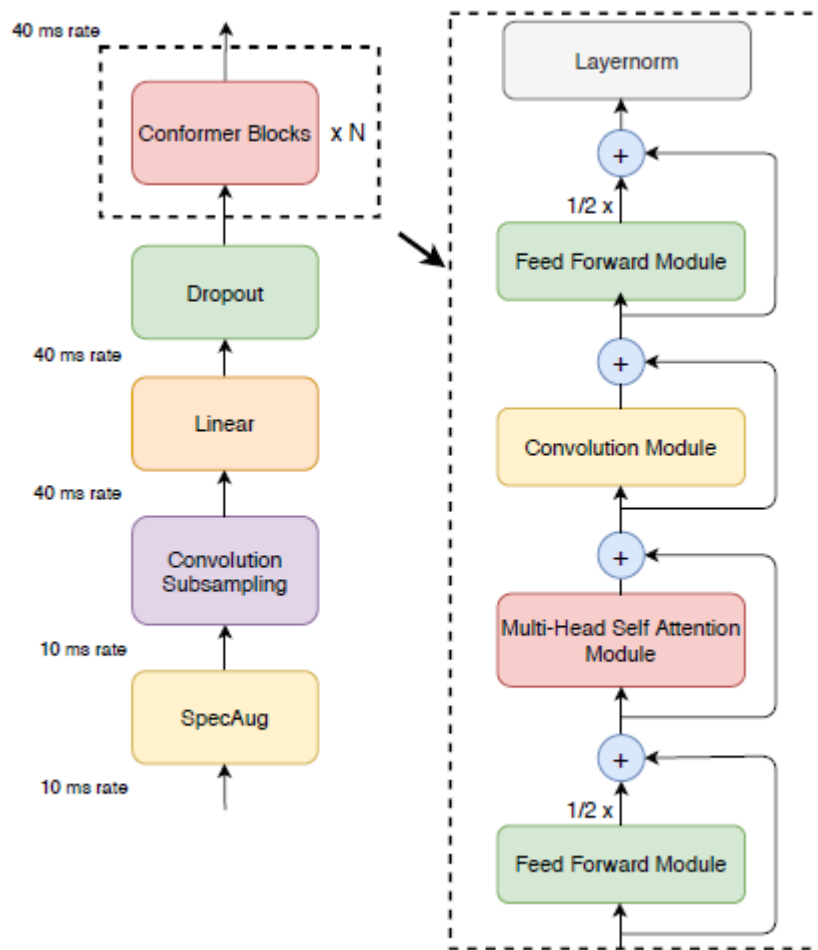
Collect
Translation



Related works

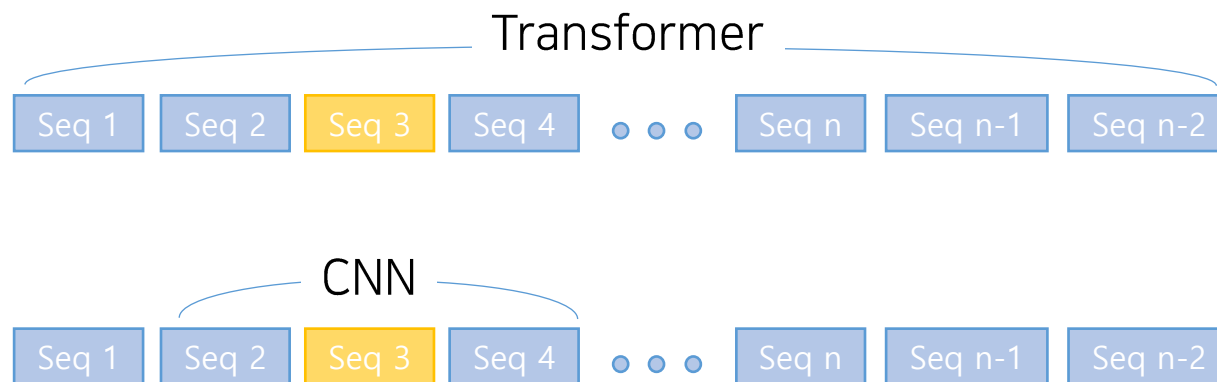
02. Related works

Conformer: Convolution-augmented Transformer for Speech Recognition



Conformer = Transformer + CNN

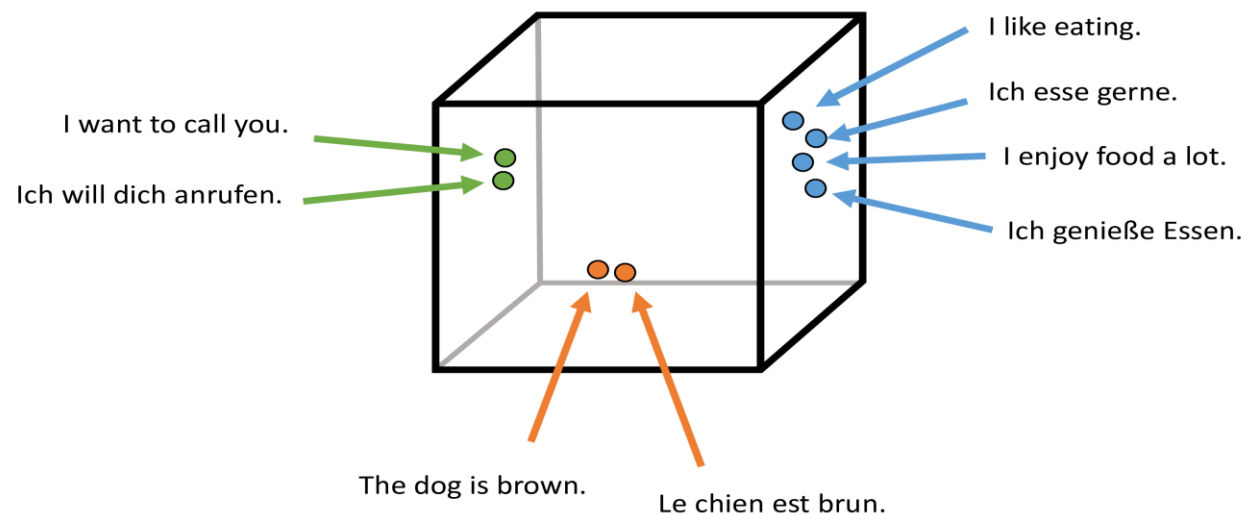
- Transformers
 - ✓ Capturing broad information in long sequences but find it challenging to extract features within a narrow scope
- CNN
 - ✓ Capturing information within a narrow scope but struggles to grasp information across a wide range



02. Related works

Vecalign: Improved Sentence Alignment in Linear Time and Space

- A fast and accurate sentence alignment algorithm for lengthy documents.

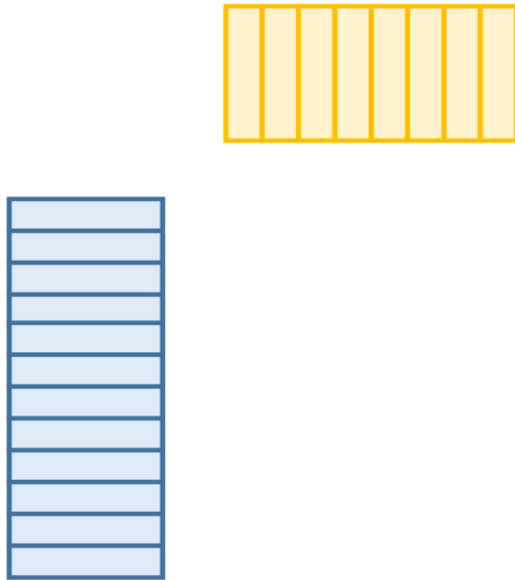


English–Korean speech translation corpus (EnKoST-C): Construction procedure and evaluation results

02. Related works

Vecalign: Improved Sentence Alignment in Linear Time and Space

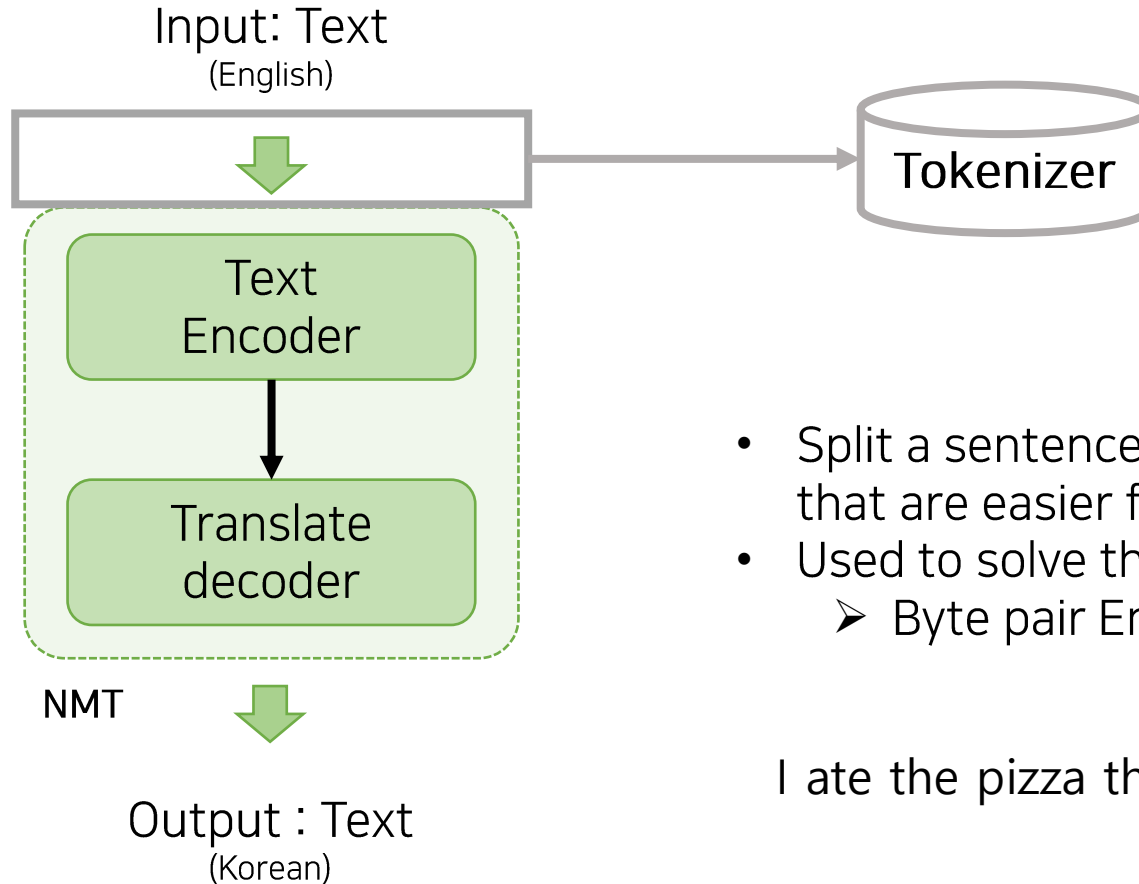
- A fast and accurate sentence alignment algorithm for lengthy documents.



English–Korean speech translation corpus (EnKoST-C): Construction procedure and evaluation results

02. Related works

Subword Segmental Machine Translation: Unifying Segmentation and Target Sentence Generation



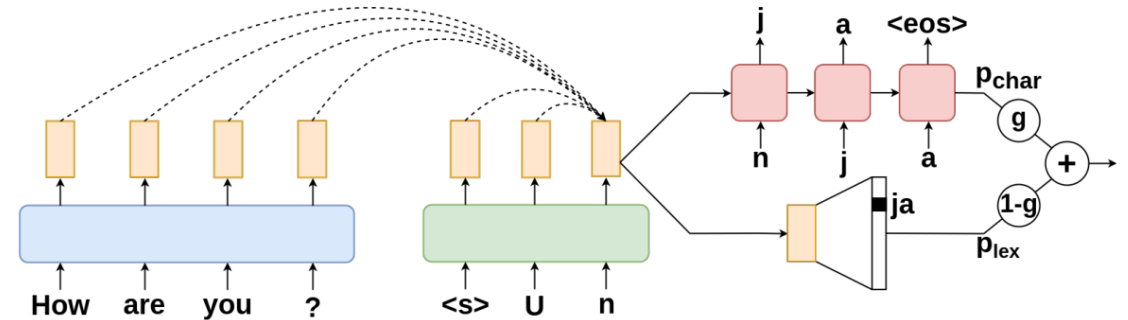
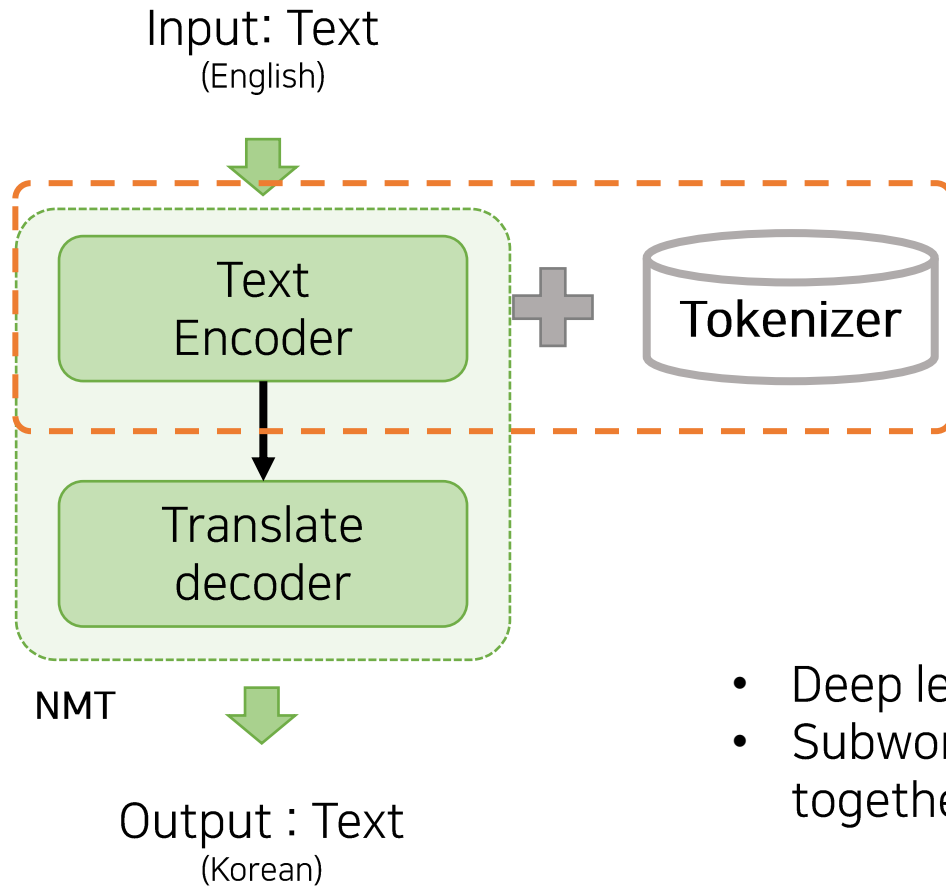
The reason tokenizers exist

- Split a sentence into tokenized units, and convert them into units that are easier for a computer to recognize
- Used to solve the Out of Vocabulary problem.
 - Byte pair Encoding

I ate the pizza this week. ➡ _I, ate_ ,the_ pizza_ this, _week.

02. Related works

Subword Segmental Machine Translation: Unifying Segmentation and Target Sentence Generation



Different from other talknizers

- Deep learning-based tokenizer
- Subword segmentation and machine translation work and learn together.



Motivation



- **Improvement of translation quality**

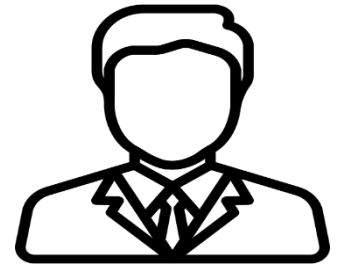
- ✓ Translating natural expression of foreigners into appropriate Korean for situation
- ✓ Improving smooth communication in real-life interpreting situations



It's not rocket science

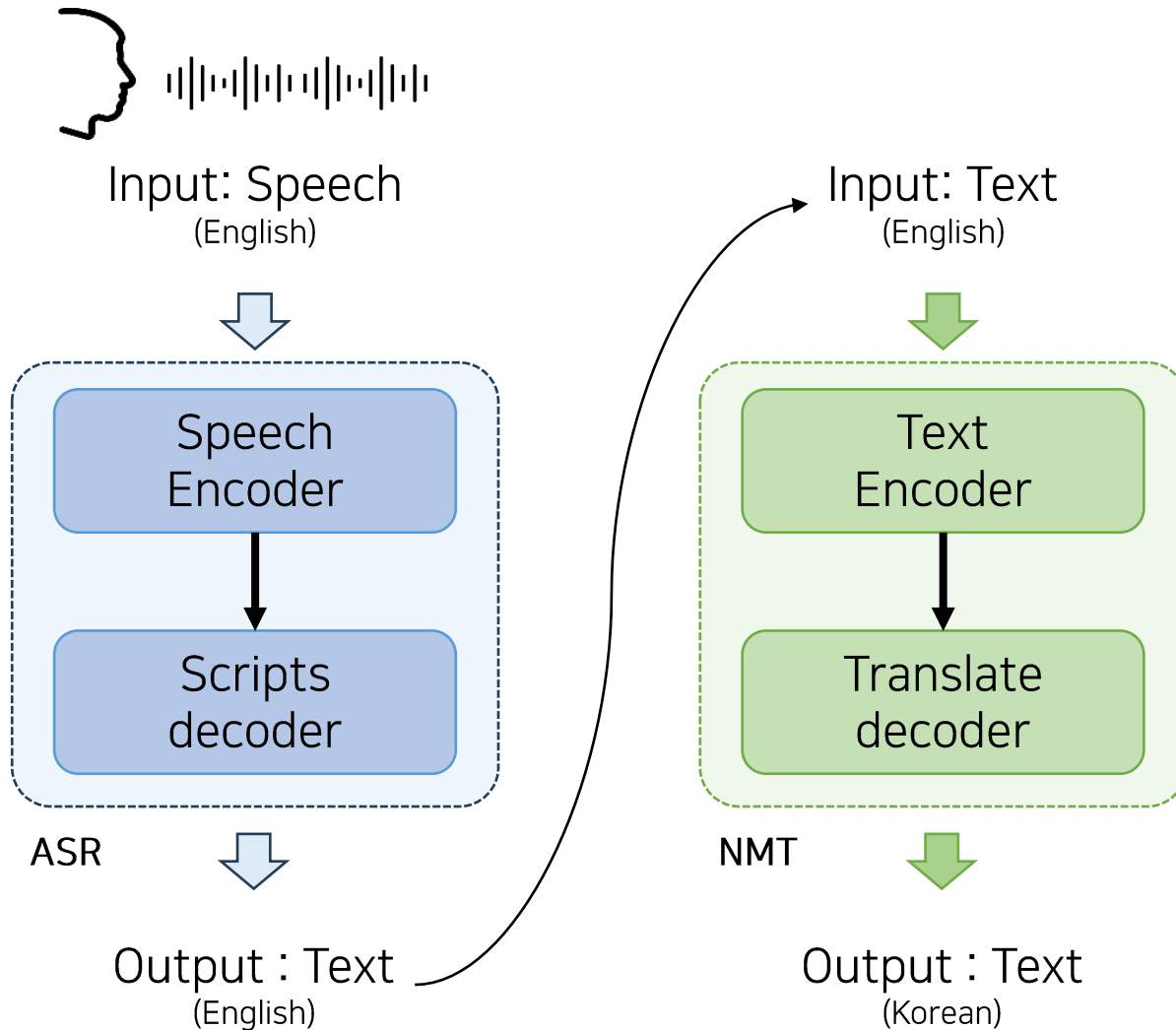


그건 쉬운 일이야



03. Motivation

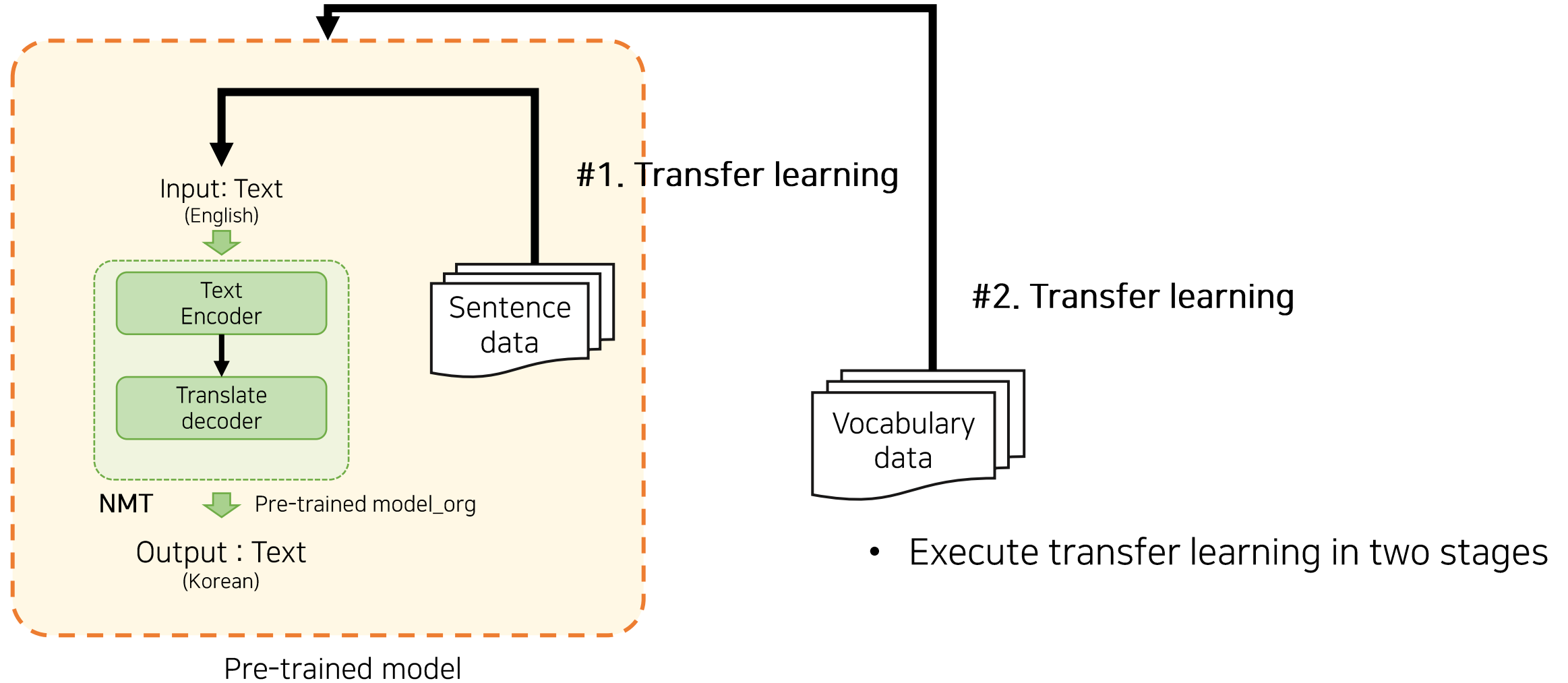
Conversational NMT model applicable in real-life scenarios



- Using an ASR model to transcribe human conversations into text
- Creating a translation model using the output of ASR through an NMT model

03. Motivation

Conversational NMT model applicable in real-life scenarios – Adaptation domain



03. Motivation

Conversational NMT model applicable in real-life scenarios – Multilingual NMT



Transparent Display Installed at Seibu Shinjuku Station [Photo: Seibu Railway]

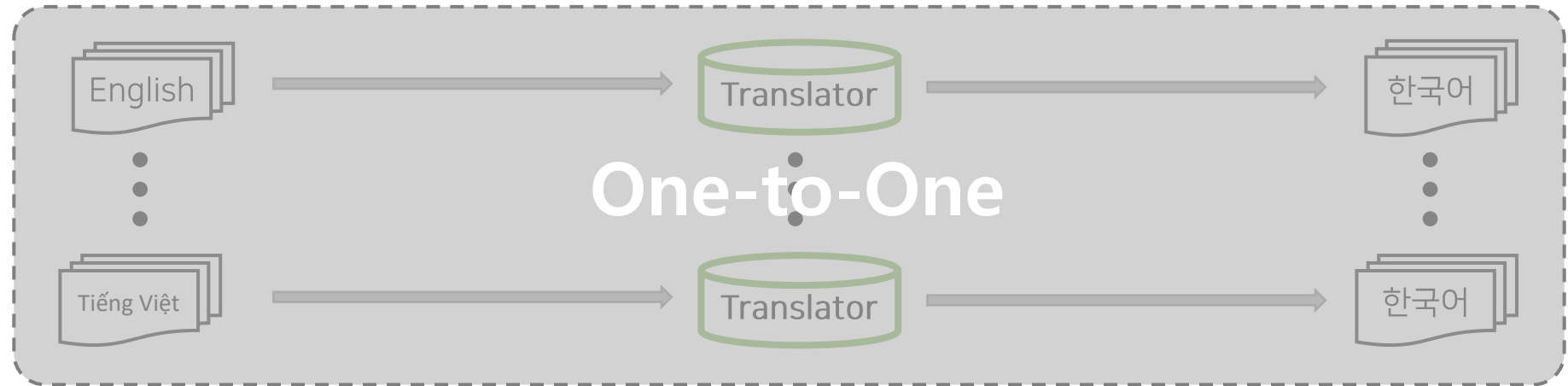
Utilizing Transparent Display for an Interpreter:

- ✓ Requires a Multilingual Language Model(Translator)
- ✓ Translation should occur after language recognition or selection

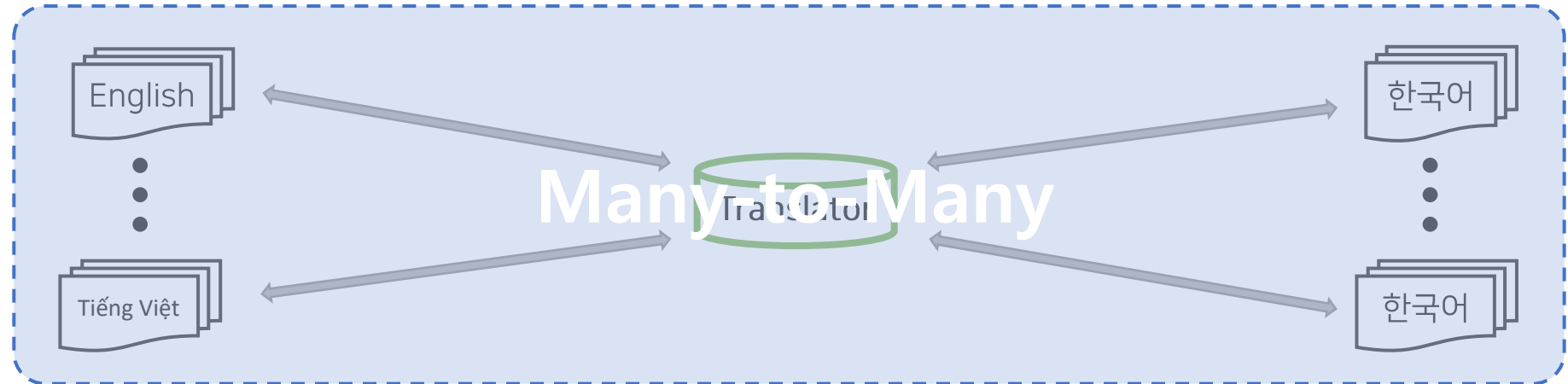
03. Motivation

Conversational NMT model applicable in real-life scenarios – Multilingual NMT

Monolingual

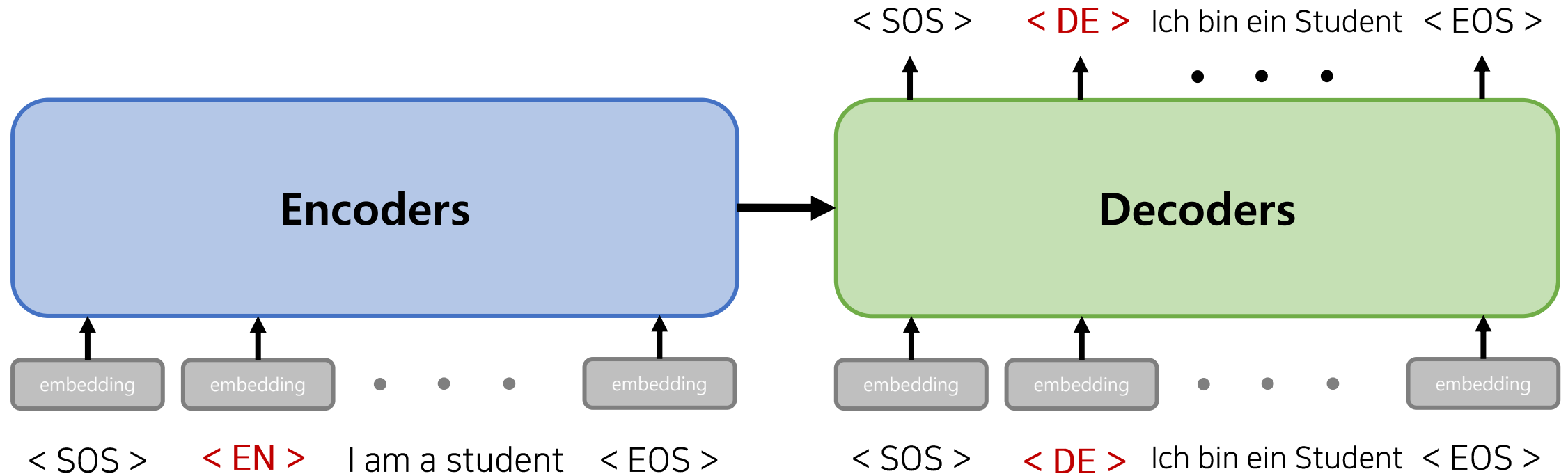


Multilingual



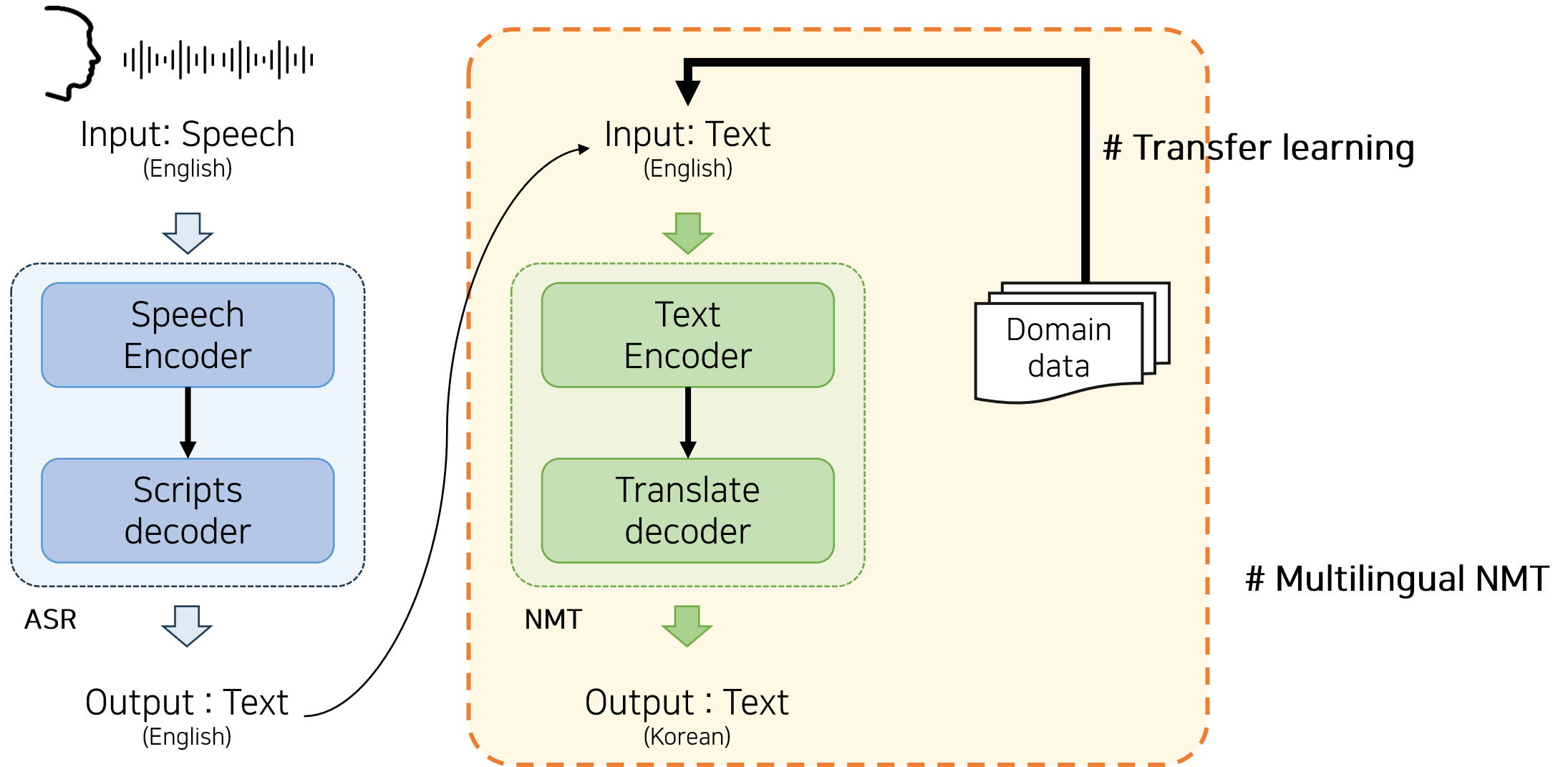
03. Motivation

Conversational NMT model applicable in real-life scenarios – Multilingual NMT



03. Motivation

Conversational NMT model applicable in real-life scenarios- structure



The slide features several thin, light blue lines. A horizontal line spans the top of the slide. A diagonal line starts from the top right and extends towards the center. Another diagonal line starts from the bottom left and extends towards the center. A horizontal line spans the bottom of the slide.

Future work

04. Future work

ASR scripts problem

Example: Uh, but but can be used in laboratory or hospital as well.

- ASR generated text data that often contains noise and may not result in a clean script.
 - Stuttering
 - Self-correction
 - Repetition
 - Stammering

Transfer learning problem

- Unwanted result variation exists in certain areas.

Ref	가장 우선적인 계획은 기존 광 네트워크와 node architecture를 검토하는 것입니다.
Hyp_TL1(Sentence)	첫 번째 계획은 기존 광 네트워크와 노드 아키텍처를 검토하는 것입니다.
Hyp_TL2(Vocabulary)	Top Plan은 기존 Optical Networks and node Architectures에 대한 Review를 수행한다.

Q & A

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