

What is the Meaning of Life?

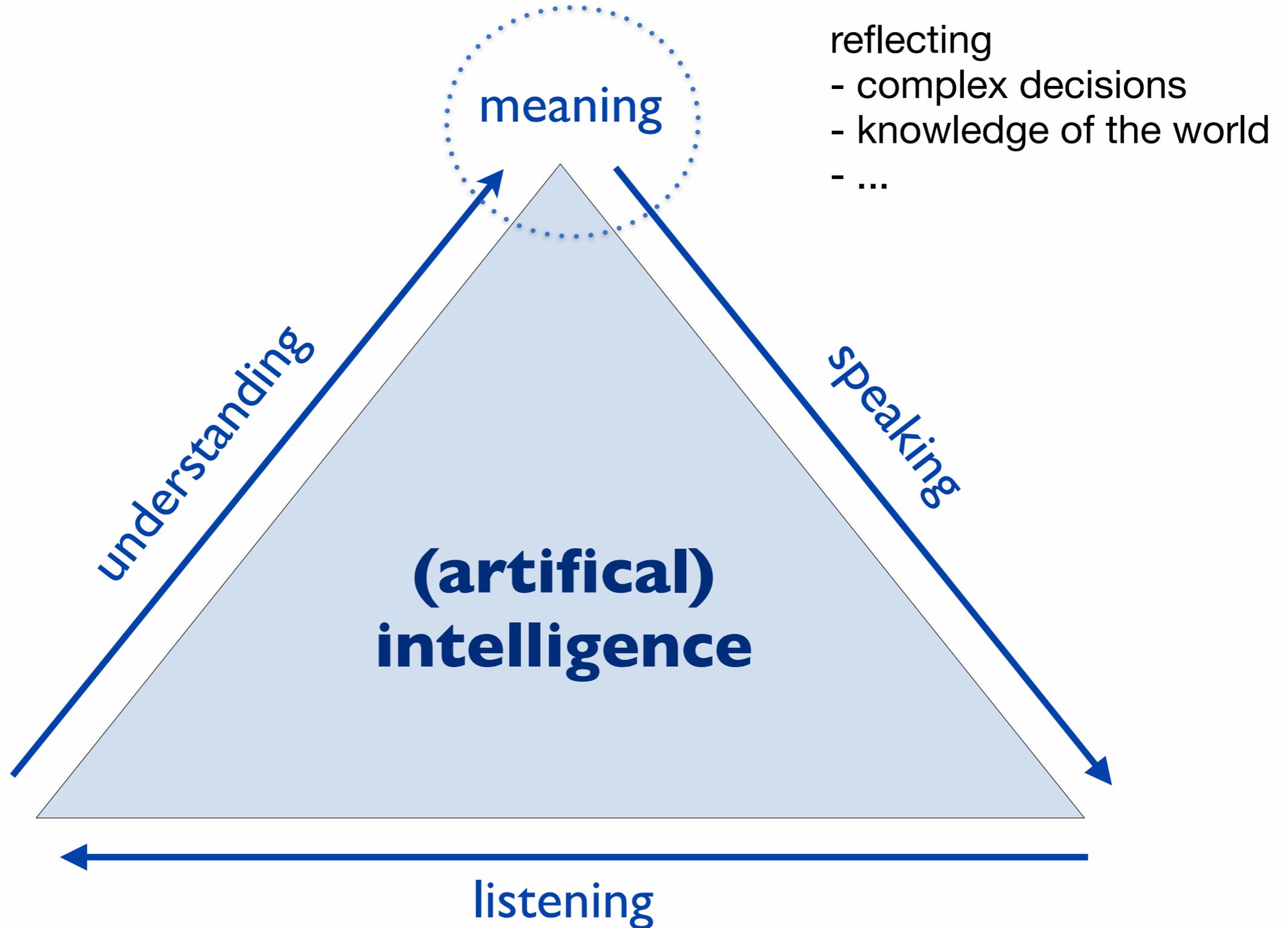
I found it in translation ...

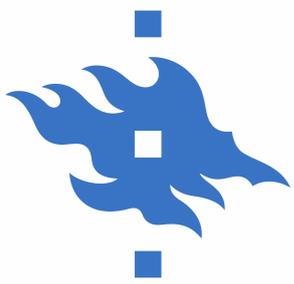
Jörg Tiedemann
University of Helsinki
jorg.tiedemann@helsinki.fi



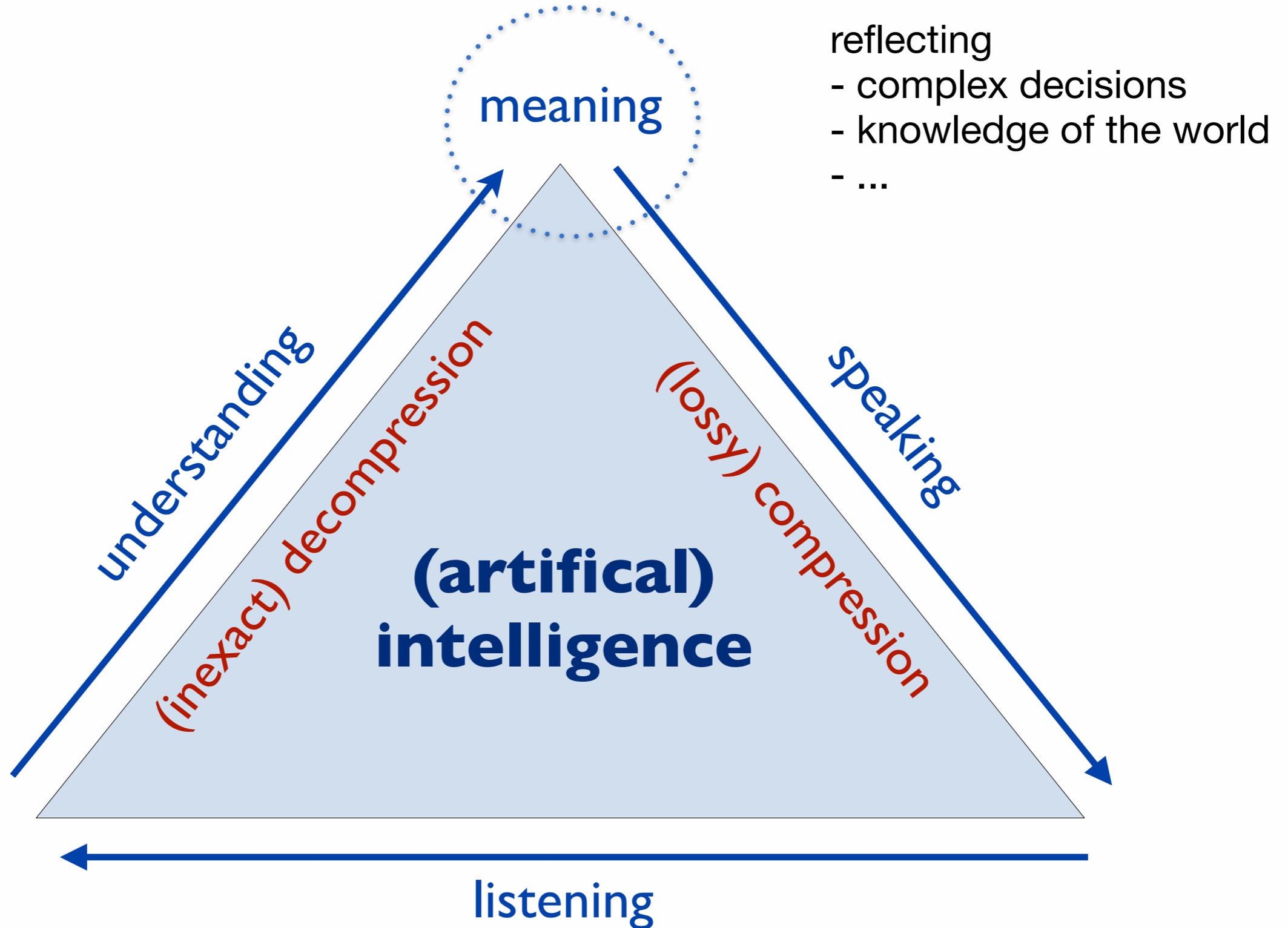


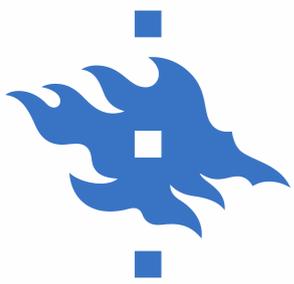
Intelligence requires Communication





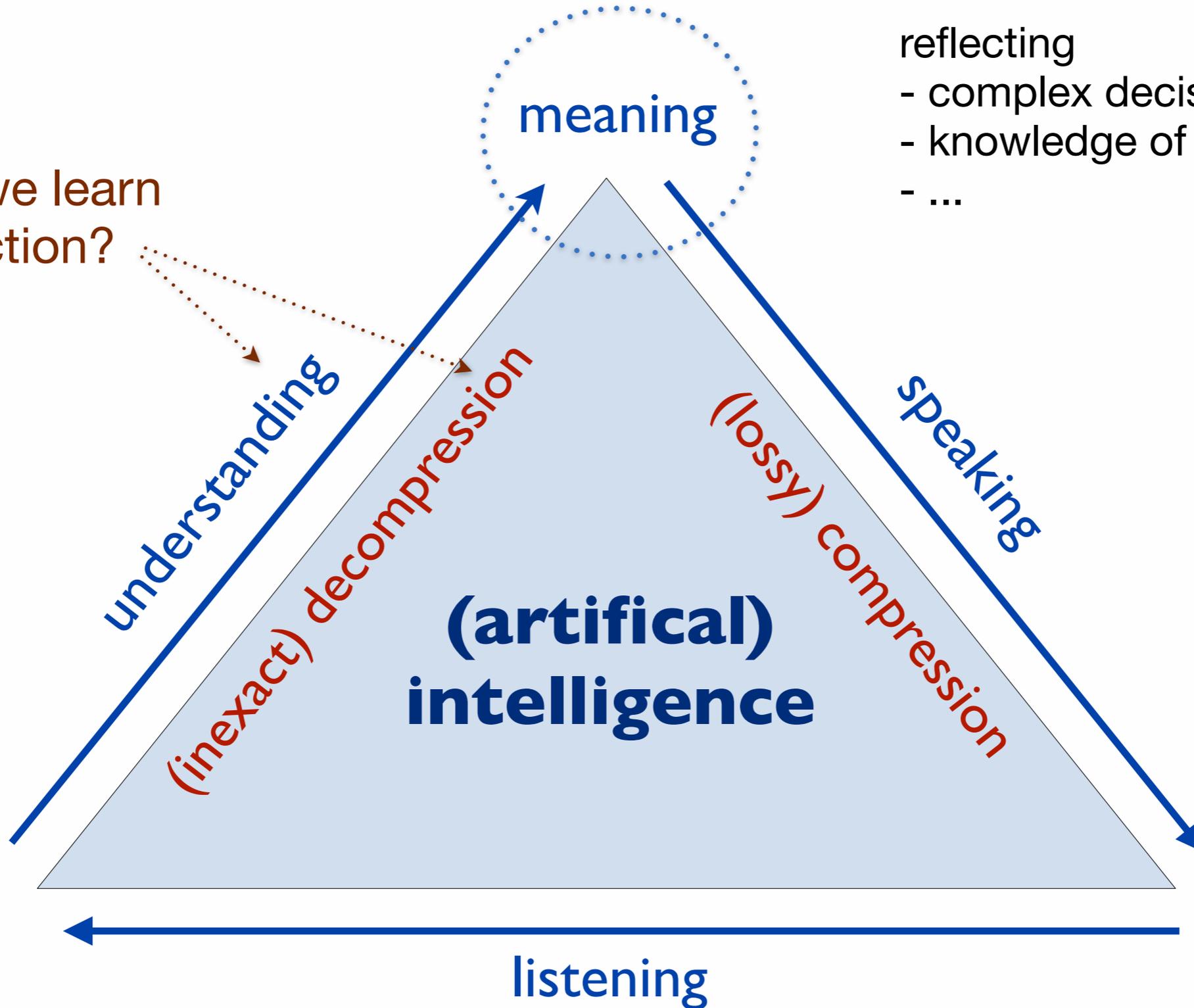
Intelligence requires Communication





Intelligence requires Communication

How can we learn that function?

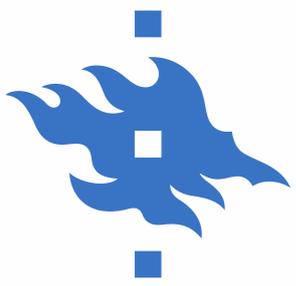




Language Grounding for NLU



- En:** A *wall* divided the city.
- De 1:** Eine *Wand* teilte die Stadt. ×
- De 2:** Eine *Mauer* teilte die Stadt. ✓



Language Grounding for NLU

visual
grounding



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Language Grounding for NLU

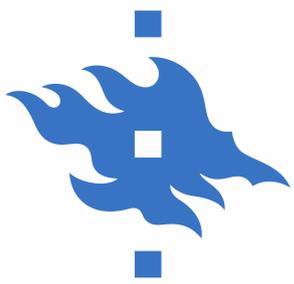
visual
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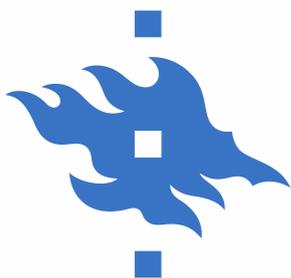
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translational
grounding



What is the Meaning of Life?



What is the Meaning of Life?

[...] inactivated and live vaccines can be safely used throughout the **life** of the birds, except during the withdrawal period before [...]

↳ eur-lex.europa.eu

[...] Stämmen unterschieden werden können, während der gesamten **Lebensdauer** der Tiere sowohl Tot- als auch Lebendimpfstoffe unbedenklich [...]

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⚠ [...] further perspectives on Hesse's spiritual and intellectual **life**, illuminating and explaining both human relations and his [...]

↳ hermann-hesse.de

⚠ [...] Karl Kerényi, erschließen weitere, für Hesses geistige **Existenz** wesentliche Quellen, beleuchten und erläutern menschliche [...]

↳ hermann-hesse.de

[...] who are poorly integrated and are victims of unemployment and of the **low life** that flourishes in the dehumanizing suburbs.

↳ europarl.europa.eu

[...] arbeitslosen Einwanderern, die in entmenslichten Vororten ein kümmerliches **Dasein** fristen, auf fruchtbaren Boden fällt.

↳ europarl.europa.eu

The liability is deferred for the **life** of the lease and bears interest at the rate of 2 percent above the prevailing European [...]

↳ ivu.nl

Die Verbindlichkeit ist auf die **Dauer** des Pachtvertrages gestundet und wird mit 2 Prozent über dem jeweiligen geltenden [...]

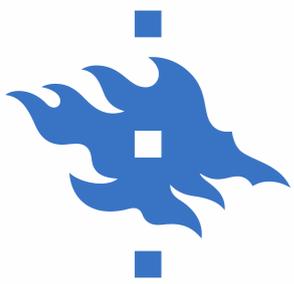
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Whereas the new German government is considering to extend the **life** of old nuclear power plants - which would certainly put a [...]

↳ pwc.de

Während die neue Bundesregierung gerade darüber nachdenkt, die **Laufzeit** alter Kernkraftwerke zu verlängern, und damit der Entwicklung [...]

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biological life

existence

duration

runtime

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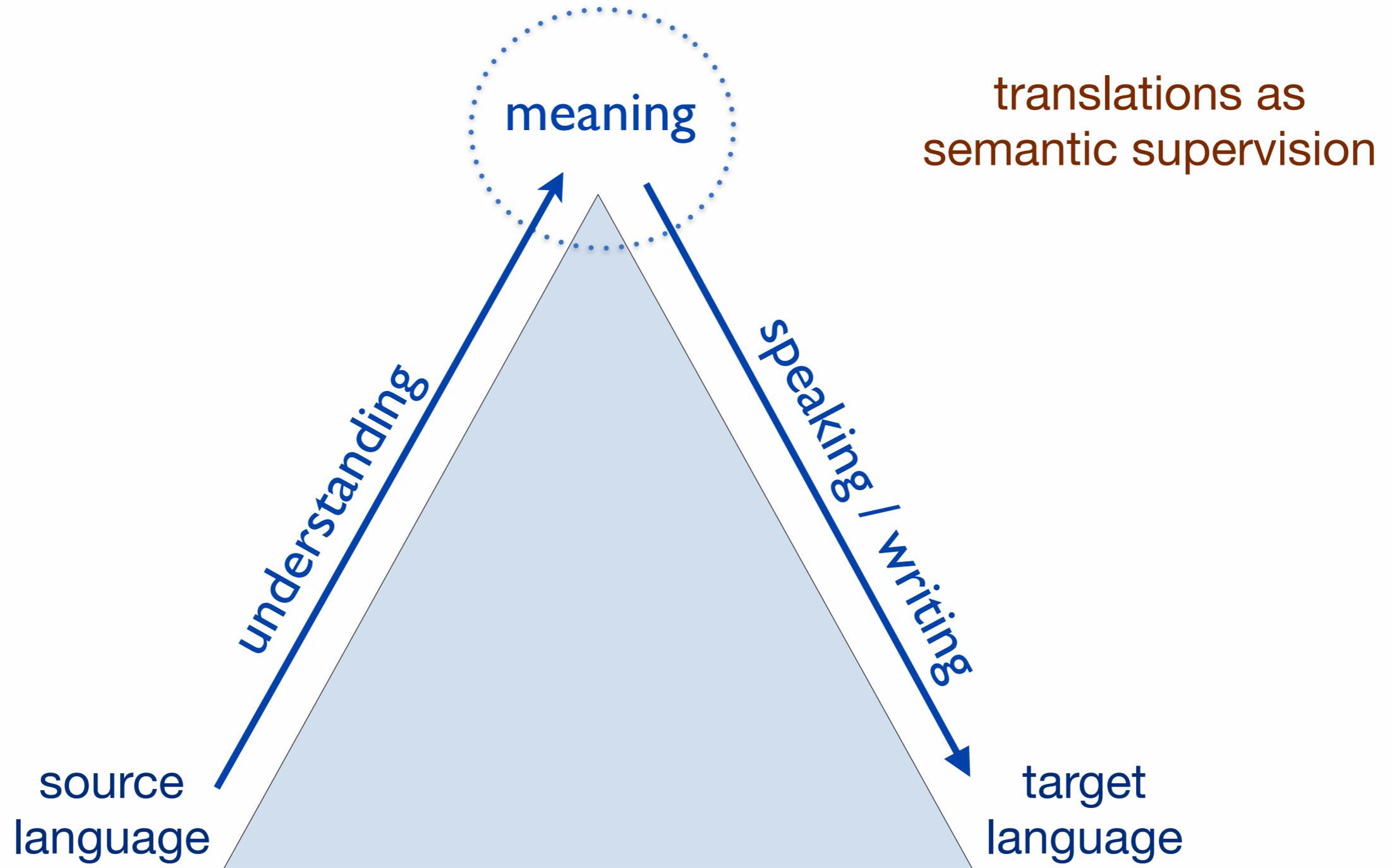
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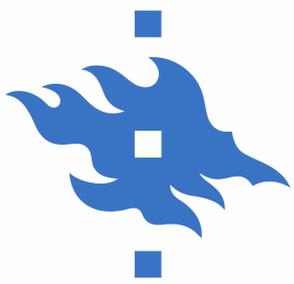
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Found in Translation

Natural Language Understanding with cross-lingual grounding





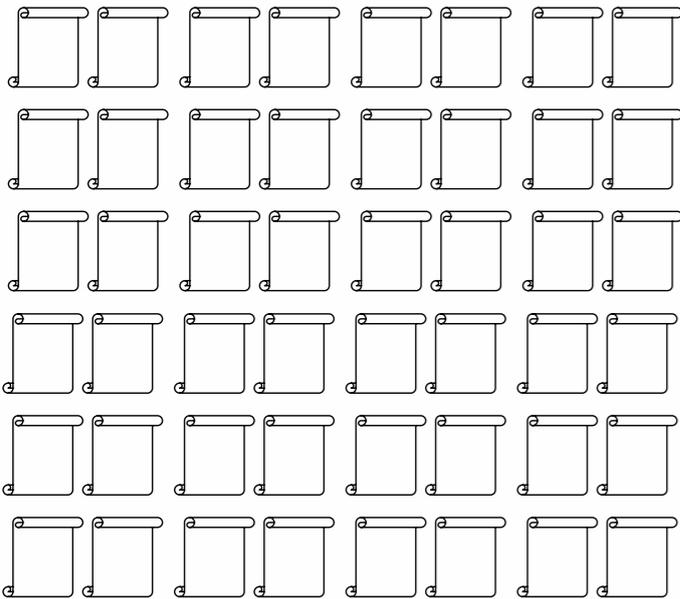
Found in Translation

Natural Language Understanding with cross-lingual grounding



translations as semantic supervision

human translations in many languages



source language

understanding

dense vector-based representation

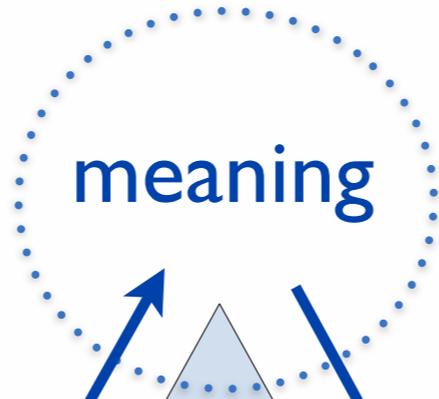
encoder

machine translation

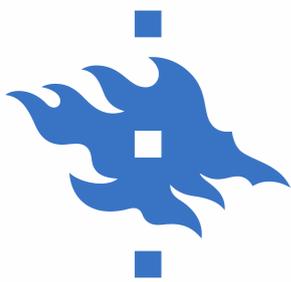
decoder

speaking / writing

target language



Learning Algorithm

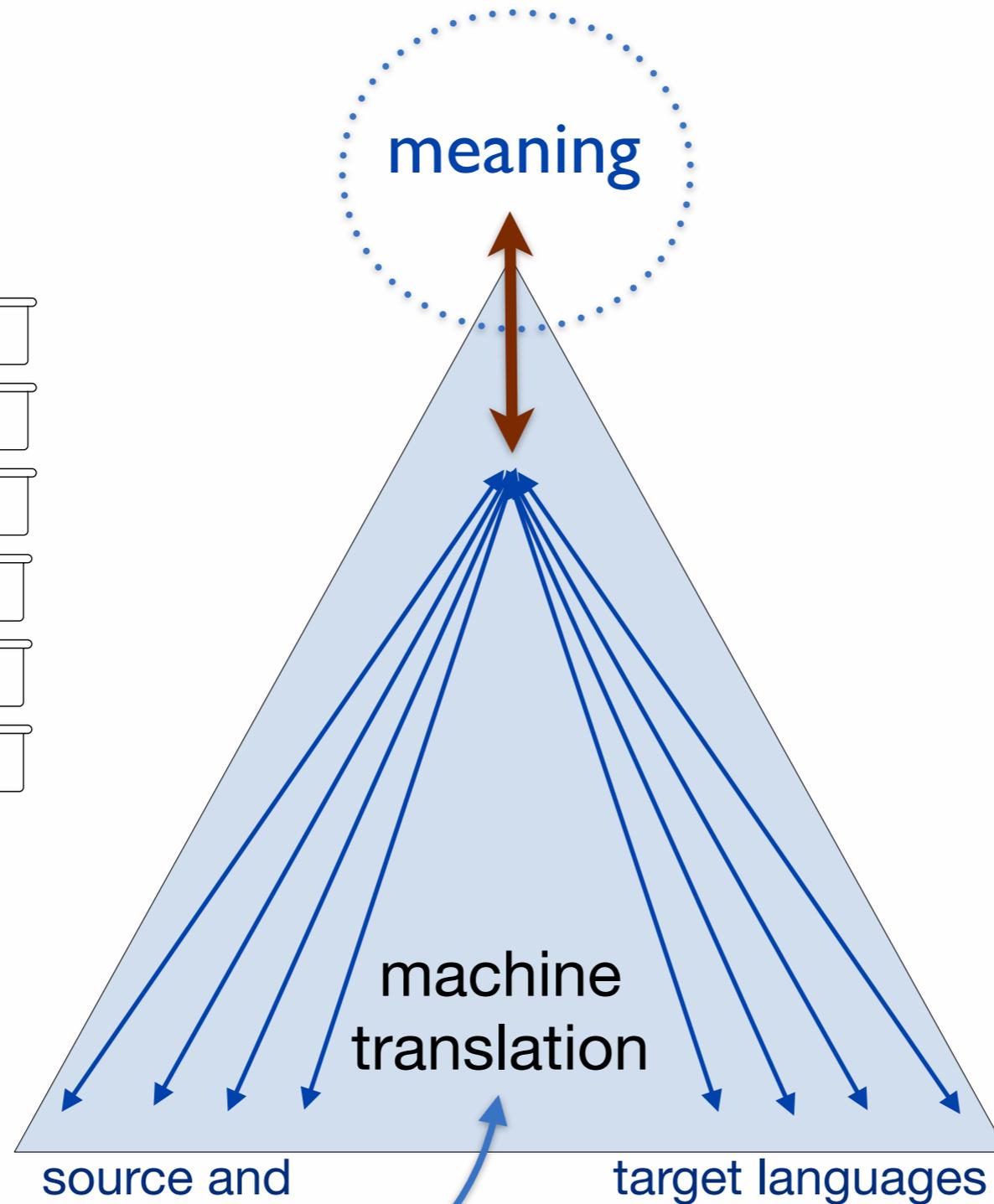
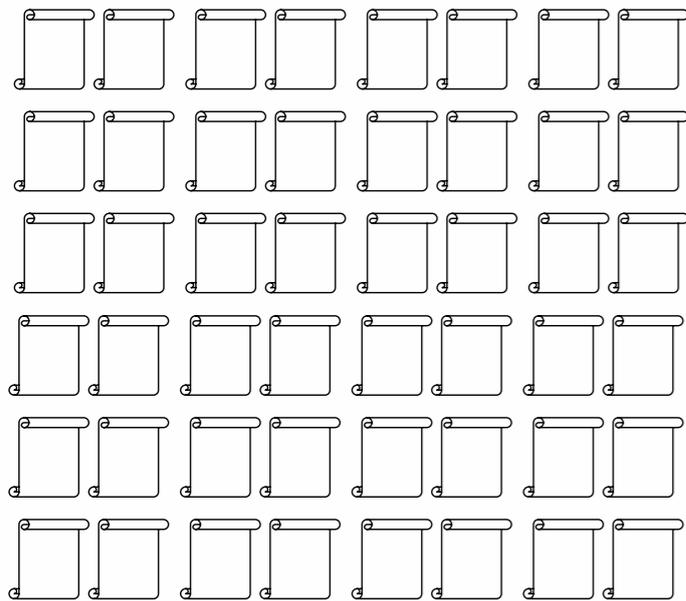


Found in Translation

Natural Language Understanding with cross-lingual grounding



human translations in many languages



Learning Algorithm

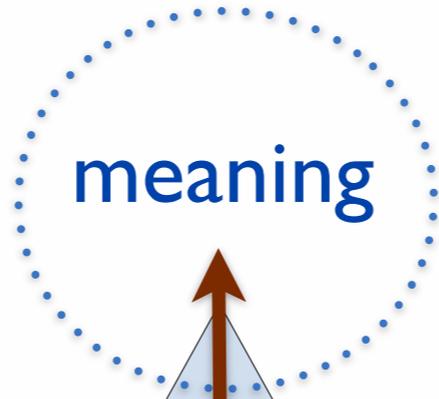
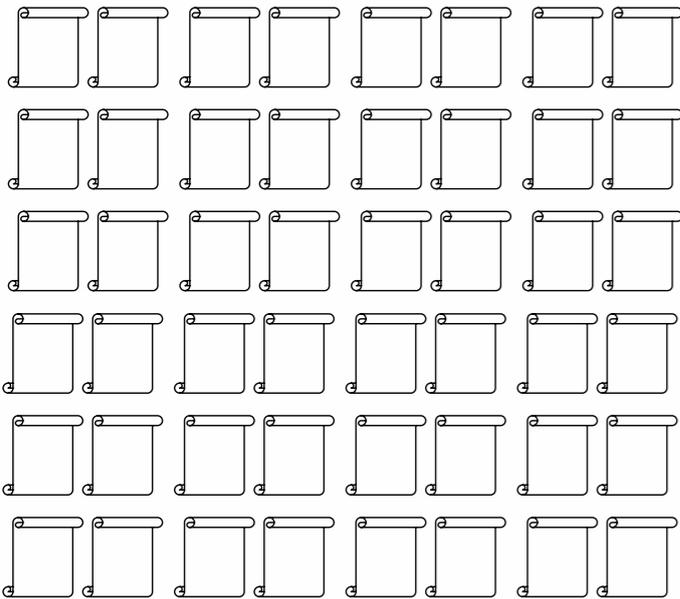


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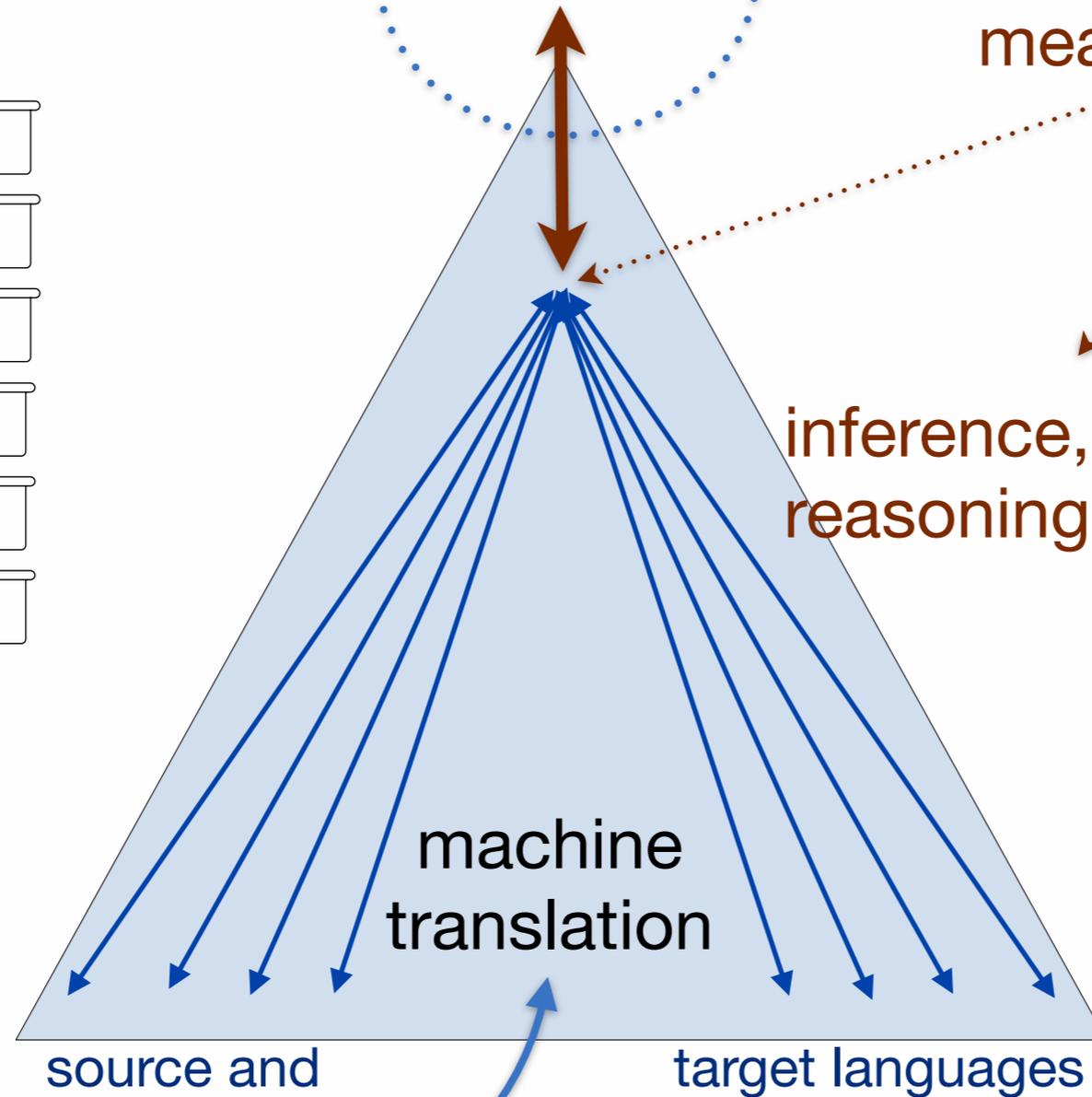
Natural Language Understanding with cross-lingual grounding



human translations in many languages

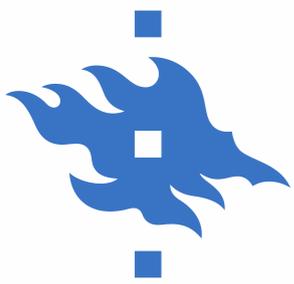


LIMR: language-independent meaning representation?

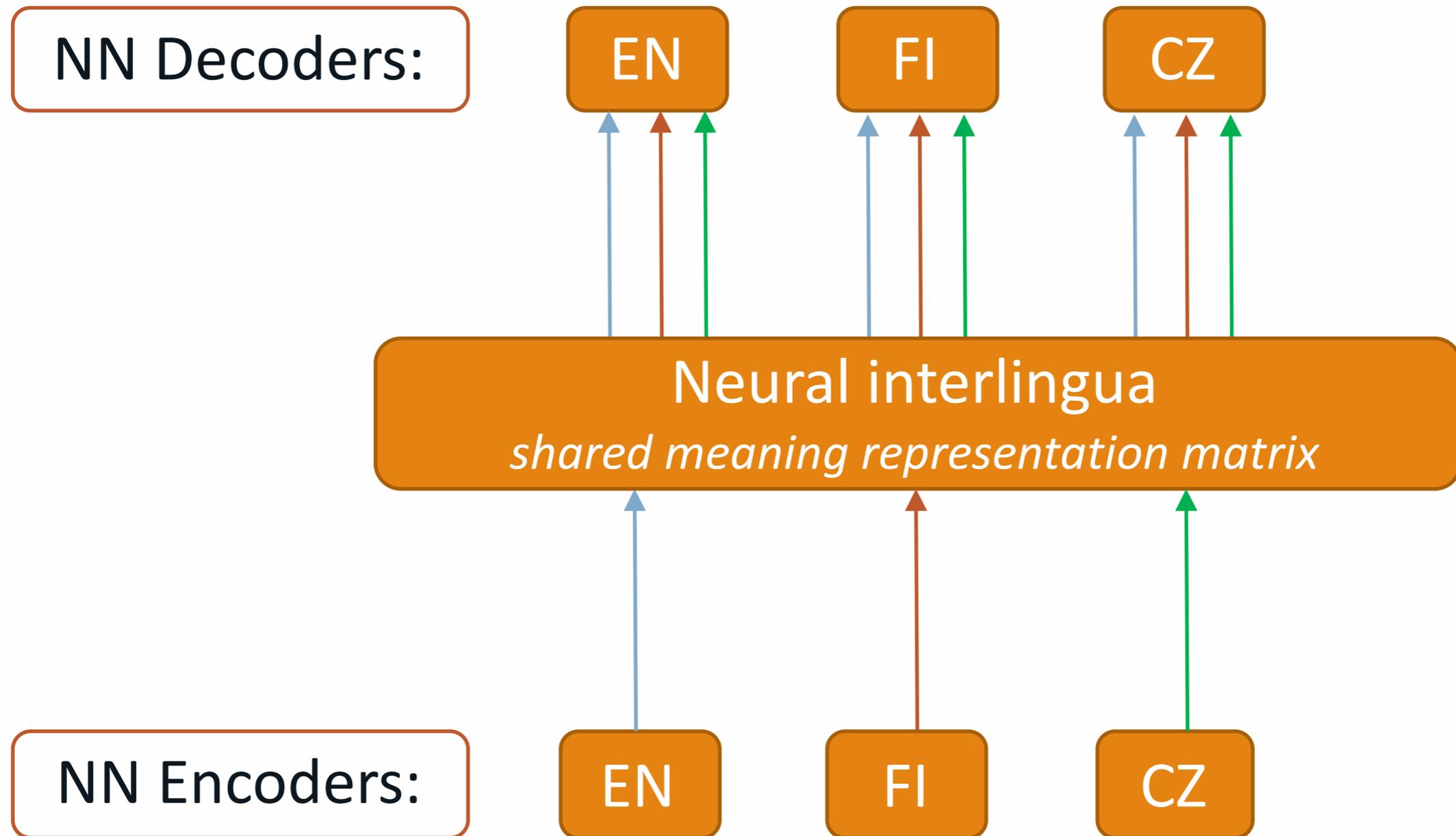


inference, paraphrase reasoning linguistic detection interpretation

Learning Algorithm



Multi-Way Neural Machine Translation



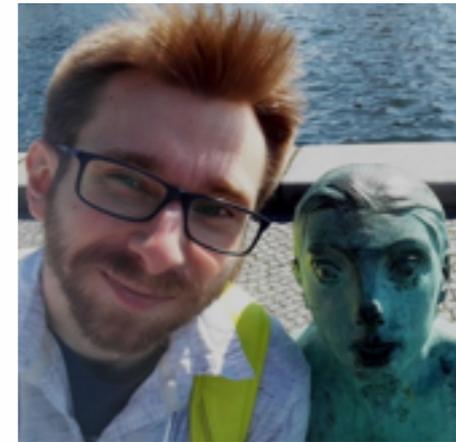


Language Technology in Helsinki

<http://blogs.helsinki.fi/language-technology/>



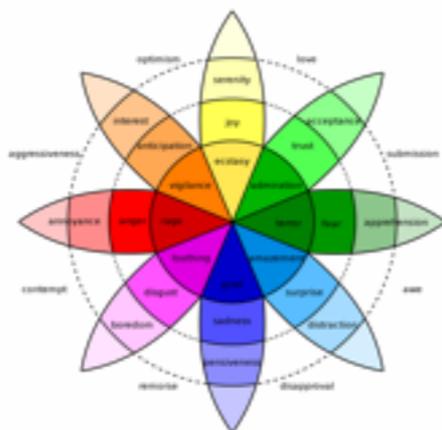
FSTs
Omorfi
FinPos



Language Technology for low-resource languages



The Peace Machine



ORPUS
<http://opus.nlpl.eu>



MeMAD
Methods for Managing
Audiovisual Data





Implementation of an “Attention Bridge”

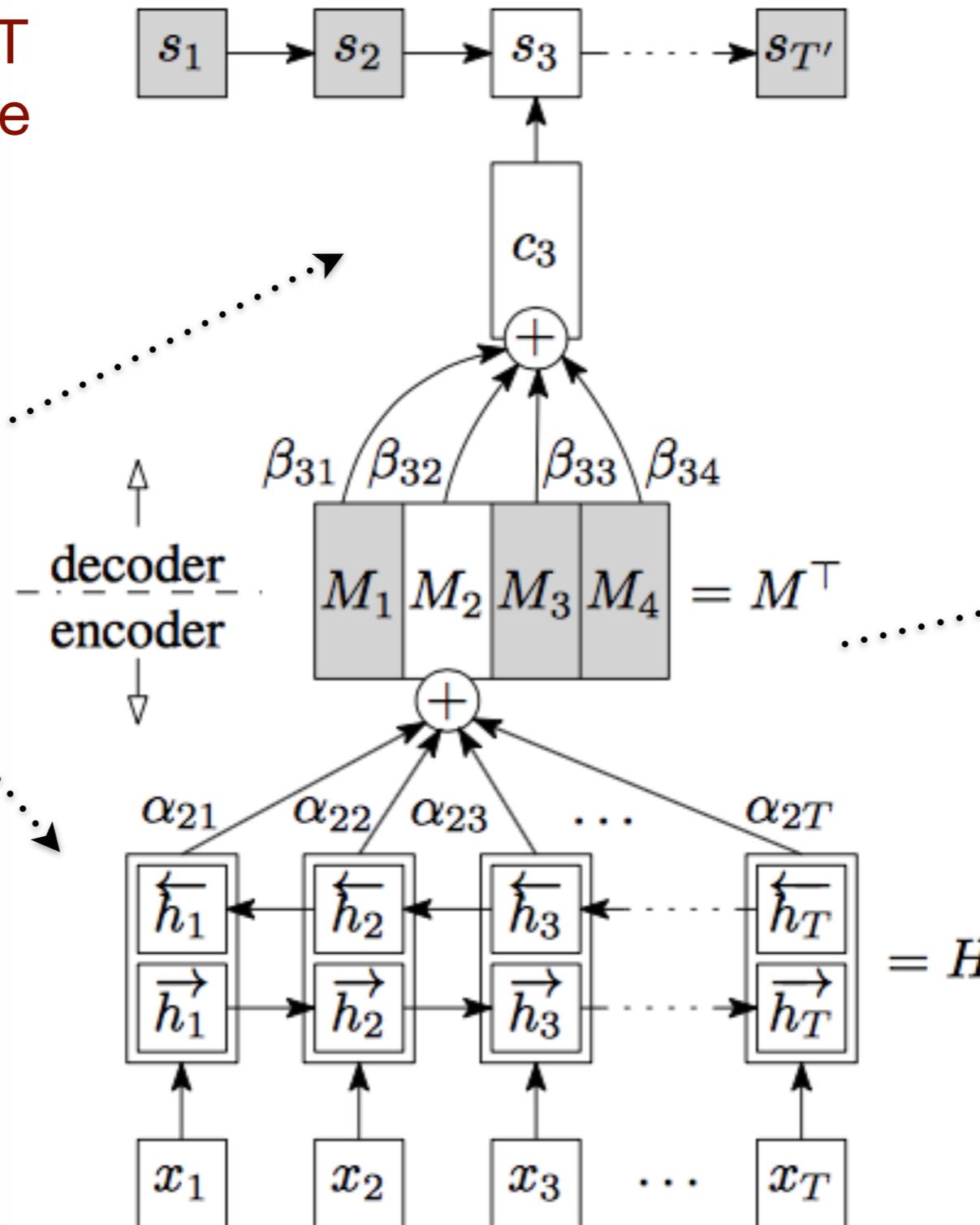
Benchmark with MT on unseen language pairs

Benchmark with semantic probing tasks

language-specific parameters

shared among all language pairs

Rotate languages in scheduled training!





Found in Translation

Natural Language Understanding with cross-lingual grounding



Goals:

