



Neural Translation for EU project

Project Objectives

Sept.19 -Aug.21

- Build SOA NMT models for all EU official language combinations (24 languages, 552 combinations) without using a high-resourced language as pivot.
- Collect clean training data:
 - 15M segments 1-1 resourced languages
 - 10-12M segments under-resourced languages
 - 10M ultra-under-resourced (Maltese, Irish)
- Upload dockerised MT engines and collected data to ELRC-SHARE and European Language Grid, for use by Public Administrations

Language matrix (24 x 23=552 engines)

	BG	CS	DA	DE	EL	ES	ET	FI	FR	GA	HR	HU	IT	LT	LV	MT	NL	PL	PT	RO	SL	SK	SV
BG	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
CS	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
DA	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
DE	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
EL	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
ES	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
ET	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
FI	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
FR	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
GA	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
HR	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
HU	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
IT	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
LT	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
LV	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MT	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
NL	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
PL	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
PT	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
RO	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
SL	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
SK	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
SV	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*



Spanish,
Portuguese,
Italian, Dutch,
Maltese, Polish,
Czech, French



Romanian,
German, English,
Bulgarian,
Hungarian,
Slovene, Greek,
Irish



Latvian, Estonian,
Lithuanian, Finnish,
Swedish, Danish,
Croatian, Slovak

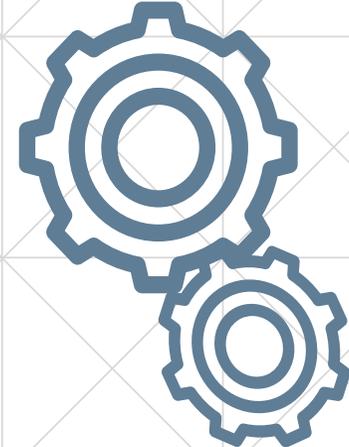
Evaluation in NTEU

- Domain: **administrative** language from the DGT.
- **Same test dataset** for all languages.
- Real documents, translated by humans into the 24 languages.
- Whole documents, not randomly extracted sentences



Automatic evaluation

- Test set consisting of 2000 sentences (one reference) from the selected evaluation dataset
- Isolated from the training and fine-tuning data.
- Metrics: BLEU, TER, F-Measure, Perplexity

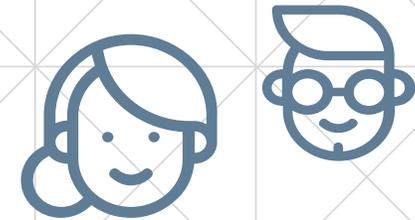


Automatic evaluation. Example engines into Irish

	Word Count	Unique W/C	F-Measure	BLEU	TER	Perplexity
BG	78.512.192	231.082	75,00	69,00	37,00	1,72
CS	74.528.702	254.614	74,00	66,00	39,00	1,77
DA	95.973.362	321.335	74,00	65,00	39,00	1,84
DE	100.197.182	352.195	70,00	61,00	45,00	1,95
EL	111.930.392	310.248	74,00	66,00	39,00	1,82
EN	139.184.957	294.704	79,00	71,00	32,00	1,59
ES	116.138.462	237.159	73,00	65,00	41,00	1,91
ET	64.917.062	357.281	71,00	63,00	43,00	1,88
FI	70.093.082	447.897	71,00	63,00	43,00	1,87
FR	140.534.927	295.465	72,00	62,00	42,00	1,94
HR	125.199.272	3.488.938	60	40	59	3,21
HU	69.579.527	238.748	71	64	44	1,99
IT	110.602.172	145.378	73	64	41	1,95
LT	69.163.832	176.464	71	62	44	1,95
LV	70.926.452	177.535	73	65	41	1,86
MT	78.396.227	192.087	78	72	34	1,62
NL	112.834.022	183.141	72	63	42	1,91
PL	77.947.667	178.575	75	67	38	1,79
PT	117.879.917	142.278	73	65	40	1,91
RO	83.706.467	135.321	76	69	37	1,74
SK	75.441.647	177.666	75	68	37	1,77
SL	77.252.492	167.103	74	67	39	1,80
SV	89.511.137	190.720	74	65	40	1,85

Human evaluation

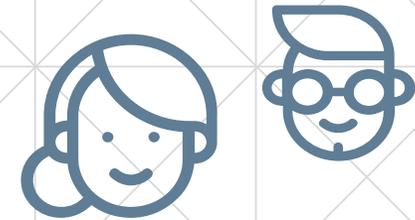
- We decided to use **native speakers of the target language** (difficult to find bilingual evaluators).
- We use Google translate as a benchmark.
- We have used a purpose-built evaluation platform, which will be published in GitHub at the end of the project as open-source code:



Machine Translation Evaluation Tool (MTET).

Human evaluation

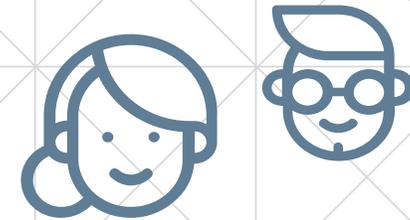
- In the evaluation platform, the evaluator is presented separately with:
 - the reference translation in the target language
 - the NTEU translation (unidentified)
 - the Google translation (unidentified) } in random order



Blind evaluation

Human evaluation

- The evaluator is asked to assess each of the automatic translations (i.e. not just rank them).
- Assessment is performed through a slider that allows choosing a number in the range of 0 to 100.
- The number of sentences that has been evaluated for each engine is 500 (a subset of the validation set used for the automatic metrics).
- To mitigate human bias, each sentence has been evaluated by two evaluators.



MTET platform. Evaluator's view

NTEU Evaluation_GA>EL (TaskId 1258 / Tuld d3Bih9B) ← Tasks

Source (ga)

→ Mar thoradh ar dheontais ón Aontas, d'éirigh le Finance Watch foireann de shaineolaithe cáilithe a chur le chéile laistigh de ghearrthréimhse, a bhí in ann staidéir, anailís ar bheartais agus gníomhaíochtaí cumarsáide a dhéanamh i réimse na seirbhísí airgeadais.

Reference (el)

→ Ως αποτέλεσμα των ενωσιακών επιχορηγήσεων, η Finance Watch κατόρθωσε, σε σύντομο χρονικό διάστημα, να συγκροτήσει ειδική ομάδα εμπειρογνομόνων που έκαναν μελέτες, ανάλυση πολιτικής και δραστηριότητες επικοινωνίας στον τομέα των χρηματοπιστωτικών υπηρεσιών.

Ως αποτέλεσμα των επιχορηγήσεων της Ένωσης, η Finance Watch κατόρθωσε να συγκροτήσει, σε σύντομο χρονικό διάστημα, ένα προσωπικό εμπειρογνομόνων για τη διενέργεια μελετών, την ανάλυση πολιτικών και δραστηριοτήτων επικοινωνίας στον τομέα των χρηματοπιστωτικών υπηρεσιών.

Ως αποτέλεσμα των επιδοτήσεων από την Ένωση, κατάφερε να Finance Watch ειδική ομάδα εμπειρογνομόνων για να ανταποκριθεί σε σύντομο χρονικό διάστημα, ήταν σε θέση μελέτες, ανάλυση της πολιτικής και των δραστηριοτήτων επικοινωνίας στον τομέα των χρηματοπιστωτικών υπηρεσιών.

Save

< 1 2 3 4 5 ... 500 > 1 / page

MTET platform. Evaluator's view

NTEU Evaluation_SL>FI(TaskId 1246 / TuId fgOZISw)

← Tasks

Source (sl)

→ Namen te uredbe je omogočiti ponovni prevzem obveznosti za preostale zneske prevzetih obveznosti za podpora izvajanju sklepov Sveta (EU) 2015/1523 in (EU) 2015/1601, ki so na voljo na podlagi Uredbe (EU) št. 516/2014 Evropskega parlamenta in Sveta, ali dodelitev teh zneskov za druge ukrepe v okviru nacionalnih programov v skladu s prednostnimi nalogami Unije in potrebami držav članic na določenih področjih azila in migracij.

Reference (fi)

→ Tämän asetuksen tarkoituksena on mahdollistaa neuvoston päätösten (EU) 2015/1523 ja (EU) 2015/1601 täytäntöönpanon, josta säädetään Euroopan parlamentin ja neuvoston asetuksessa (EU) N:o 516/2014, tukemiseksi tehtyjen maksusitoumusten jäljellä olevien määrien sitominen uudelleen tai näiden määrien siirtäminen muihin kansallisten ohjelmien mukaisiin toimiin tiettyihin turvapaikka- ja muuttoliikeasioihin liittyvien unionin painopisteiden ja jäsenvaltioiden tarpeiden mukaisesti.

Tämän asetuksen tarkoituksena on mahdollistaa jäljellä olevien sitoumusten sitominen uudelleen neuvoston päätösten (EU) 2015/1523 ja (EU) 2015/1601 täytäntöönpanon tueksi, saatavilla Euroopan parlamentin ja neuvoston asetuksen (EU) N:o

41

Tämän asetuksen tarkoituksena on mahdollistaa Euroopan parlamentin ja neuvoston asetuksen (EU) βPATHβ 516/2014 nojalla käytettävissä olevien neuvoston päätösten (EU) 2015/1523 ja (EU) 2015/1601 täytäntöönpanoa tukevien maksusitoumusten jäljellä olevien määrien maksaminen uudelleen tai näiden määrien jakaminen muihin kansallisiin ohjelmiin kuuluviin toimiin unionin painopisteiden ja jäsenvaltioiden tarpeiden mukaisesti tietyillä turvapaikka- ja maahanmuuttoaloilla.

92

Change

< 1 2 3 4 5 ... 500 > 1 / page

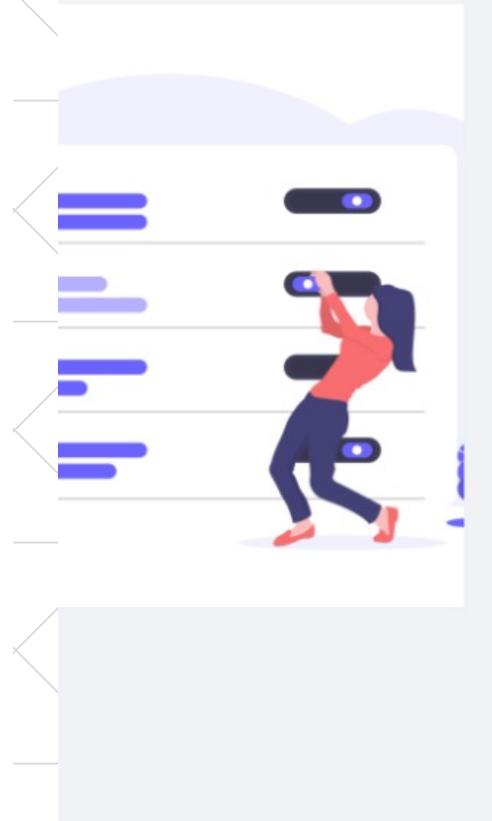
MTET platform. Administrator's view

Tu ID	Language	Source	Reference
raODqOm	RO	<p>Beneficiarii Tratatului de la Marrakesh sunt persoane nevăzătoare, persoane care au deficiențe de vedere ce nu pot fi corectate pentru a obține o funcție vizuală sensibil echivalentă cu cea a unei persoane fără astfel de deficiențe, persoane care au un handicap de percepție ori dificultăți de citire, inclusiv dislexie sau orice altă dizabilitate de învățare, care le împiedică să citească opere imprimare în aceeași măsură, în esență, ca persoanele fără astfel de dizabilități și persoane care suferă de o dizabilitate fizică ce le împiedică să țină în mână ori să manipuleze o carte sau să își concentreze privirea ori să își miște ochii astfel încât să poată citi, în măsura în care, ca urmare a acestor deficiențe sau dizabilități, acele persoane nu pot citi opere tipărite în aceeași măsură, în esență, ca o persoană care nu este afectată de astfel de deficiențe sau dizabilități.</p>	<p>Marakešo sutarties naudos gavėjai yra asmenys, kurie yra akli, asmenys, kurie turi regos sutrikimą, kurio neįmanoma sumažinti taip, kad jų rega iš esmės nesiskirtų nuo regos asmens, neturinčio tokio sutrikimo, asmenys, kurie turi suvokimo ar skaitymo negalią, įskaitant disleksiją ar bet kokį mokymosi sutrikimą, ir todėl negali skaityti spausdintų kūrinių iš esmės taip pat, kaip tokios negalios neturintys asmenys, ir asmenys, kurie dėl fizinės negalios nepajėgia laikyti ar vartyti knygos arba sutelkti žvilgsnio ar judinti akių taip, kaip to paprastai reikėtų norint skaityti, jei dėl tokių sutrikimų ar negalios tie asmenys nepajėgia skaityti spausdintų kūrinių iš esmės taip, kaip tokio sutrikimo ar negalios neturintys asmenys;</p>
e_ro		<p>Marakešo sutarties gavėjai yra aklieji, silpnaregiai žmonės, kurie negali būti ištaisyti gauti vizualiai funkciją iš esmės lygiavertis asmenų tokių trūkumų, žmonės su regėjimo sutrikimais arba skaitymo sunkumų, įskaitant disleksija ar kitoje mokymosi negalios, kuri apsaugo juos nuo skaito spausdintus kūrinius tiek pat, kiek žmonių be tokių negalia ir žmonėms su fizine negalia, kurie neleidžia jiems laikyti ir tvarkymo knyga, arba sutelkti savo akis arba perkelti savo akis, kad jie gali skaityti tiek, kiek kad, kaip šiuos trūkumus ar negalia rezultatas, šie asmenys negali skaityti spaudinius į ta pačia apimtimi, iš esmės, kaip asmenį, kuris neturi įtakos tokių trūkumų ar negalia</p>	
act		<p>Marakešo sutarties naudos gavėjai yra aklieji asmenys, regėjimo sutrikimų turintys asmenys, kurių negalima ištaisyti, kad būtų pasiekta regėjimo funkcija, kuri yra žymiai lygiavertė žmogaus, neturinčio tokių sutrikimų, regėjimo sutrikimų ar skaitymo sutrikimų, įskaitant</p>	

MTET platform. Administrator's view

Manager:

can manage projects, assign tasks and keep track of the status of each of these tasks.



Projects

+ Add

Id	Name	Source	Target	Type	#Tus	#Tuvs	Complete %		
679	NTEU Evaluation_RO>LT	ro	lt	zero-to-one-hundred	500	2000	<div style="width: 50%;"><div style="background-color: #007bff;"></div></div> 50.00%	Actions	
678	NTEU Evaluation_MT2>DE	mt	de	zero-to-one-hundred	500	2000	<div style="width: 100%;"><div style="background-color: #28a745;"></div></div>	Actions	
675	NTEU Evaluation_MT>HU	mt	hu	zero-to-one-hundred	500	2000	<div style="width: 55.5%;"><div style="background-color: #007bff;"></div></div> 55.50%	Actions	
674	NTEU Evaluation_IT>HU	it	hu	zero-to-one-hundred	500	2000	<div style="width: 82.2%;"><div style="background-color: #007bff;"></div></div> 82.20%	Actions	

So, how well have the NTEU engines fared?



NTEU engine is far better than Google in uncommon language combinations, where Google uses pivots



	NTEU (Kantan)	Google
BG	51,72	27,49
CS	87,00	76,34
DA	50,30	14,95
DE	90,13	76,45
EL	46,52	9,84
EN	95,06	89,23
ES	92,23	77,56
ET	42,34	11,88
FI	88,94	75,81
FR	57,10	26,34
HU	87,89	75,06
LT	48,13	13,09
NL	33,16	14,10
PT	10,28	4,82

Target: Romanian

	NTEU (Kantan)	Google
BG	78,07	33,04
CS	89,85	44,81
DA	77,82	38,63
DE	47,23	13,11
EN	91,51	56,49
EL	89,92	46,26
ES	77,56	42,67
ET	88,30	43,30
FI	74,36	45,47
FR	79,66	42,30
LT	86,39	44,73
LV	76,83	46,09
NL	75,91	35,73
PL	77,98	46,52
PT	75,21	42,90

Target: Hungarian

But is also better in more common combinations

	NTEU	Google
<i>Danish - German</i>	80,33	60,96
<i>English - German</i>	76,77	48,57
<i>Dutch - German</i>	92,30	72, 28
<i>English-French</i>	83,01	67,11
<i>Portuguese-Spanish</i>	92,44	57,14
<i>French-Spanish</i>	91,33	62,86

Mostly for engines involving English the differences are less significant

	NTEU	Google
<i>Spanish-English</i>	91,44	88,71
<i>Maltese - English</i>	90,46	88,08
<i>Irish - English</i>	39,82	35,52
<i>English - Bulgarian</i>	92,41	84,42

Only two engines yield worse results than Google

	NTEU	Google
<i>English - Maltese</i>	82,52	88,41
<i>Bulgarian - Maltese</i>	77,56	80,74

Maltese as target.

English-Maltese Google Translate has quite good results.

These engines are being retrained to improve the metrics.

Results

- Around 90% of the NTEU engines are **better than Google** with statistical relevance.
- The other 10% are similar to Google or slightly better.

