# DEMONSTRATION OF A NEURAL MACHINE TRANSLATION SYSTEM WITH ONLINE LEARNING FOR TRANSLATORS

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# INTRODUCTION

- Translation industry needs to produce high quality translations in short periods of time.
- Machine translation can help them to achieve this goal.
- In stead of translating from scratch, correcting (**post-editing**) an automatic translation has become a common process.

# ONLINE LEARNING ADAPTATION

- In order to benefit from user post-edits, we adapt the system *on-the-fly*.
- When the human post-editor validates a sentence, we update the NMT models.
- Inherently to this process, new bilingual data is generated.
- This new data can be profited to enrich the translation systems in an online learning environment.
- IN-HOUSE ONLINE LEARNING FRAMEWORK
  - Translation servers based on OpenNMT-py.
  - Integrated with translators user-friendly interface SDL Trados Studio.
  - Scheme set to measure productivity through Trados Studio.

- We take a parallel training pair composed of the source sentence and the user post-edit.
- We follow gradient descent, the regular training methods for neural networks.

### ARCHITECTURE



Translation server: https://github.com/midobal/OpenNMT-py/tree/OnlineLearning

# USER INTERFACE



Configuration Clipboard	File Actions Formatting QuickInsert 🖬 Translation Memory 🖬 Terminology	Segment Actions	Navigation Editing
Editor	< 🔂 Translation Results - ActivaTM Translation Provider	<b>д х</b>	Term Recognition I ×
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	I [[ORG]] has established requirements for production and process controls, including availability of Device Master Records, Device History Records, Processing Records and procedures to document that Customer and regulatory requirements have been met. I [[ORG]] ha establecido requisitos para el disponibilidad de Amo de Dispositivo, De procedimientos para documentar el cump reglamentarios.	control de la producción y el proceso, incluida la vice History Records, Processing Records y olimiento de los requisitos normativos y	
	Activa TM Translation Provider		
	🛐 Translation Results - ActivaTM Translation Provider 🗬 Fragment Matches - ActivaTM Translation Provider 🚜 Concordance Search 🕮 Comments 💈	TQAs (0) 🗐 Messages (0)	Term Recognition 🕵 Termbase Search
	test1EDIT.txt.sdlxliff [Translation]*		▼ X
	<ul> <li>[[ORG]] has established requirements for production and process controls, including availability of Device Master Records,</li> <li>Device History Records, Processing Records and procedures to document that Customer and regulatory requirements have been met.</li> </ul>	99% [[ORG]] ha establecido requisitos para Dispositivo, Device History Records, Pr requisitos normativos y reglamentarios.	el control de la producción y el proceso, incluida la disponibilidad de Amo de ocessing Records y procedimientos para documentar el cumplimiento de los
	2 QSE # 9:		
	3 Change Management		
	4 Overview:		
	5 [[ORG]] has established the requirements for managing all changes within the scope of the QMS in a consistent manner.		
	6 Quality System Elements (QSE), Continued		
	7 QSE # 10:		
	8 Document / Records Controls		
	g Overview:		
	10 [[ORG]] has established the requirements for processes used to manage documents governed by the QMS.		
	11 QSE # 11:		
	12 Customer Management		
	13 Overview:		
	14 [[ORG]] has established processes for Customer and complaint management.		
	15 Process.		
	16 Mechanisms have been established to monitor Customer feedback for adherence to their requirements.		
The Welcome	17 Feedback can come from a variety of sources, including, but not limited to, surveys, site visits and complaints.		
Projects	18 QSE # 12:		
	19 Nonconforming Product		
Files	20 Overview:	<u> </u>	
Reports	[[ORG]] has established the requirements for assuring that nonconformance events identified by the QMS are documented, evaluated for risk, and that appropriate containment and segregation actions and corrections are taken to return process/product		
🖋 Editor	22 QSE # 13:	7	
Translation Memories	23 Corrective and Preventive Actions (CAPA)		
	24 Overview:		
실 Qualitivity	25 QSE # 14:		
	26 Internal Audit		
	27 Overview:	٦	✓

🍸 All segments INS 🗋 97.88% 🥒 2.12% 🖧 0.00% 🖾 Chars: 269 💈 0/8245 💻 🗲

## EXAMPLE OF LOGGING THE MEASURE PRODUCTIVITY

#### - <contentText>

<source>[[ORG]] has established requirements for production and process controls, including availability of Device Master Records, Device History Records, Processing Records and procedures to document that Customer and regulatory requirements have been met.</source>

<targetOriginal>[[ORG]] ha establecido requisitos para el control de la producción y el proceso, incluida la disponibilidad de Amo

#### PRELIMINARY EXPERIMENTS

Preliminary experiments in simulated and real environments with professional translators<sup>1</sup>:

	de Dispositivo, Device History Records, Processing Records y procedimientos para documentar el cumplimiento de los requisitos normativos y reglamentarios. <targetupdated>[[ORG]] ha establecido requisitos para los controles de producción y procesos, incluida la disponibilidad de un registro maestro de Dispositivo, Device History Records, Processing Records y procedimientos para documentar el cumplimiento de los requisitos normativos y reglamentarios.</targetupdated>
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- Significant improvements of translation quality (5.3 hTER and 7.8 hBLEU).
- Significant reduction of the post-editing time (7.5 second per sentence).

<sup>1</sup> Miguel Domingo, Mercedes García-Martínez, Álvaro Peris, Alexandre Helle, Amando Estela, Laurent Bié, Francisco Casacuberta, and Manuel Herranz. 2019. Incremental adaptation of NMT for professional post-editors: A user study. In Proceedings of the Machine Translation Summit. Under publication.

### ACKNOWLEDGEMENTS

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