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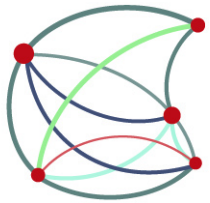
Machine Learning and Language Processing (MLLP) Research Group

P. Baquero, J. Civera, G. Garcés, A. Giménez, J. Iranzo, J. Jorge,
A. Juan, A. Pérez, A. Sanchis and J. A. Silvestre

www.mllp.upv.es



MLLP | Machine Learning and Language Processing

VRAIN

UNIVERSITAT POLITÈCNICA DE VALÈNCIA

Contents

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1 Research areas and projects

Areas:

- Automatic Speech Recognition (ASR)
- Machine Translation (MT)
- Speech Translation (ST)
- Text-To-Speech (TTS)

Projects:

transLectures
Transcription and Translation of Video Lectures

2011–14 (FP7)

EMMA EUROPEAN MULTIPLE MOOC AGGREGATOR

2014–16 (FP7)

X5GON

2017–20 (H2020)

+ a number of related Spanish and Valencian projects

Technology transfer: CdT UE, AppTek, JSI, HPI, ULisboa, . . .

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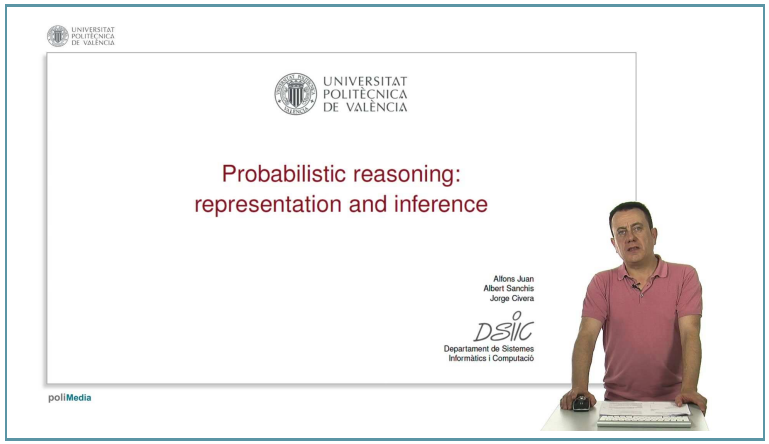
2 Classic example of our main goal

poliMedia in Spanish

poliMedia in English



Goal: automatic multilingual subtitling/dubbing

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3 ASR quality

ASR Quality measured in Word Error Rate (%)

System	A punt Ca	pM Es	RTVE Es	VL En	VL Sl	TED Sl	Avg.
Google S2T	45	20	49	29	50	38	39
VRAIN-MLLP	19	9	13	19	16	17	16
Rel. Error (%)	-58	-55	-73	-34	-68	-53	-59

Best System Award

IberSpeech-RTVE 2018 TV Speech to Text Challenge

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4 Streaming ASR

poliSubs: `http://polisubs.upv.es`

UPV app for live automatic multilingual subtitling

Sample Demo: Professor Lee Rubenstein at UPV

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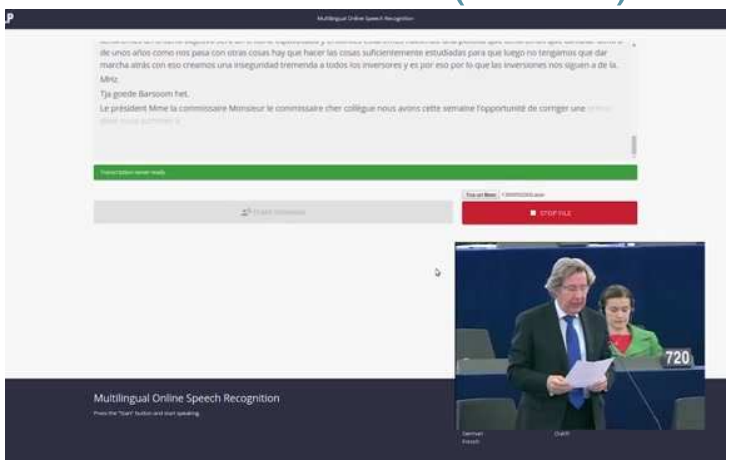
5 Multilingual, on-line transcription

EP session (5’12”)



MLLP’s live multilingual, on-line transcription tool

Proof of concept developed for the EP in 2017/18

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6 Neural Machine Translation

Table 1: WMT19 News Translation.

De-En		En-De		De-Fr		Fr-De	
Google-Trans.	45.3	Microsoft	44.9	Microsoft	35.0	Microsoft	37.3
Microsoft	42.8	NEU	43.5	eTranslation	32.7	Lingua Custodia	35.6
Facebook FAIR	40.8	UCambridge	43.0	LIUM	29.7	***MLLP***	34.5
NiuTrans	40.5	FAIR	42.7	***MLLP***	27.5	Kyoto University	34.3
UCambridge	39.7	JHU	42.5	*Google-Trans.*	26.6	LIUM	33.4
RWTH Aachen	39.6	eTranslation	41.9	TartuNLP-c	24.8	*Google-Trans.*	32.2
MLLP	39.3	***MLLP***	41.7	-	-	TartuNLP-c	30.7
DFKI	38.8	*Google-Trans.*	41.6	-	-	-	-
JHU	38.1	DFKI	41.6	-	-	-	-
UEDIN	35.0	Helsinki-NLP	41.4	-	-	-	-
TartuNLP-c	33.9	LMU	40.3	-	-	-	-
PROMT	32.1	UdS-DFKI	38.6	-	-	-	-
-	-	PROMT NMT	37.9	-	-	-	-
-	-	TartuNLP-c	36.4	-	-	-	-

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Neural Machine Translation (cont.)

Table 2: WMT19 Similar Language Translation.

Portuguese → Spanish

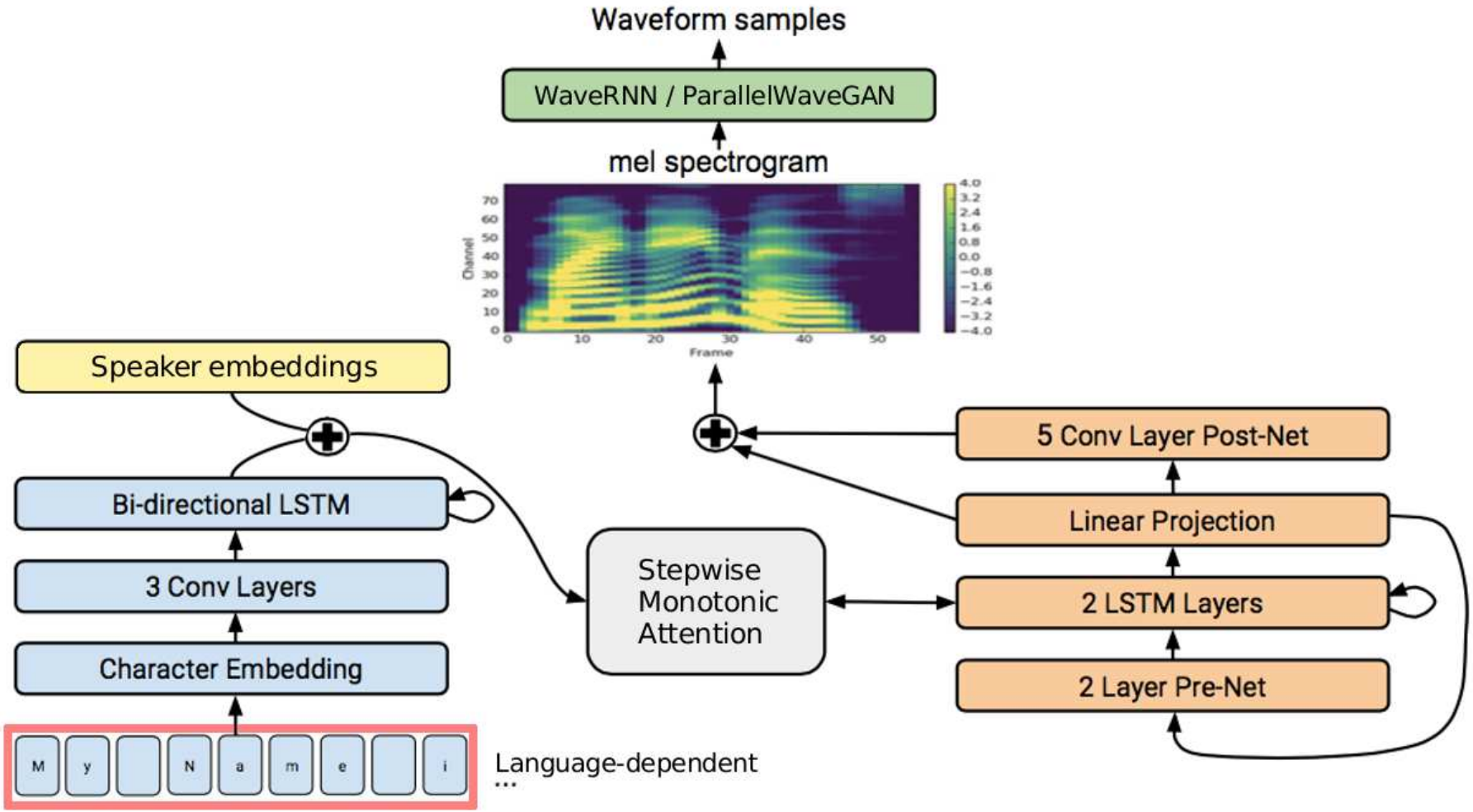
Team	BLEU	TER
MLLP	**66.6**	**19.7**
NICT	59.9	25.3
U. Helsinki	58.4	25.3
Kyoto U.	56.9	26.9
BSC	54.8	29.8
UBC-NLP	52.3	32.9
MLLP-2D	49.7	32.1

Spanish → Portuguese

Team	BLEU	TER
MLLP	**64.7**	**20.8**
UPC-TALP	62.1	23.0
NICT	53.3	29.1
U. Helsinki	52.0	29.4
UBC-NLP	46.1	36.0
BSC	44.0	37.5

7 End-to-end Text-To-Speech

Text $\xrightarrow{\text{Tacotron-2}}$ Mel spectrogram $\xrightarrow{\text{WaveRNN}}$ Waveform



First tests with Tacotron-2

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