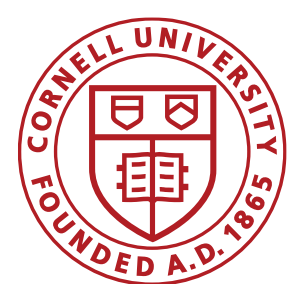


Team C2L2 Combining Global Models for Parsing Universal Dependencies



Tianze Shi

Felix G. Wu

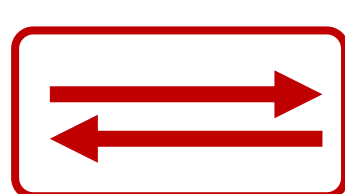
Xilun Chen

Yao Cheng

Cornell University

Highlights

$\operatorname{argmax}_{y \in \mathcal{Y}}$



$fi \rightarrow sme$



2nd



1st

• Global transition-based models

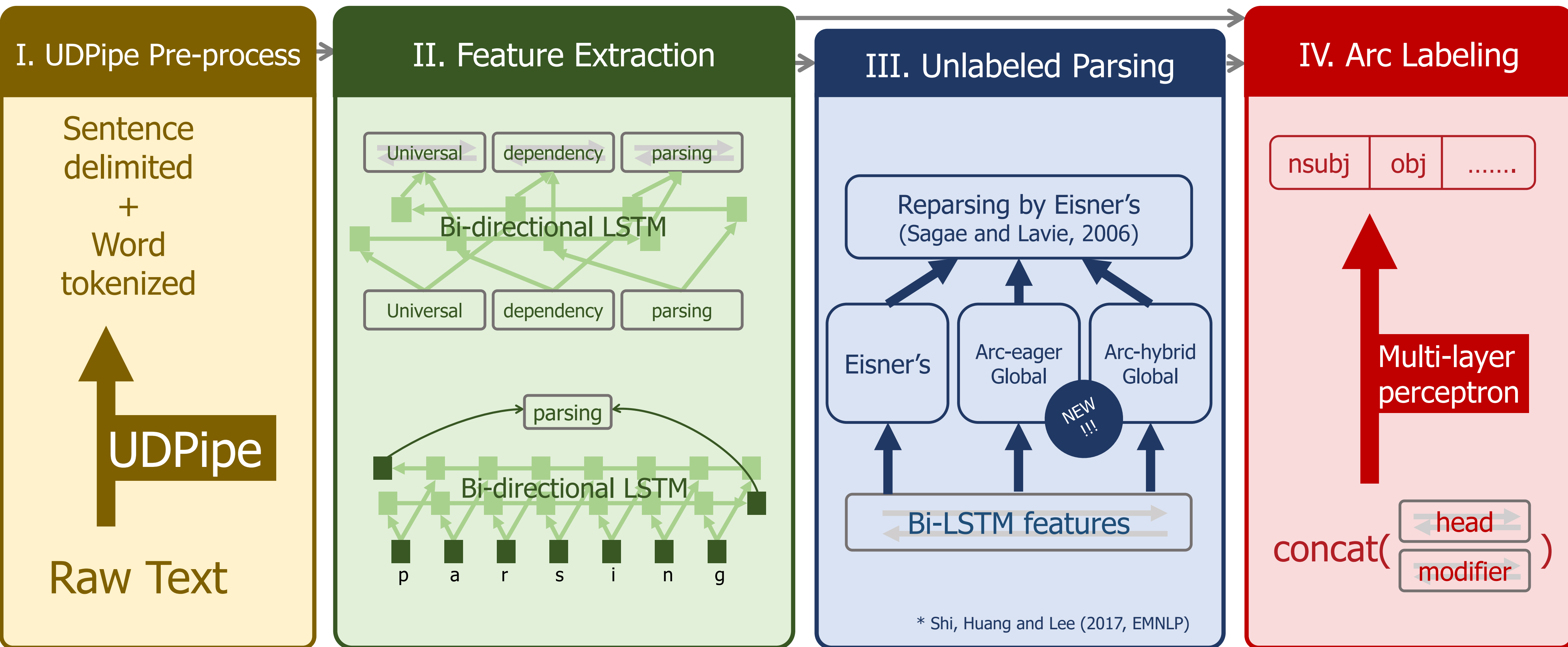
• Bi-LSTM-powered compact features

• Delexicalized syntactic transfer

• High efficiency, low resource demand

• Overall

• Small Treebanks
• Surprise Languages



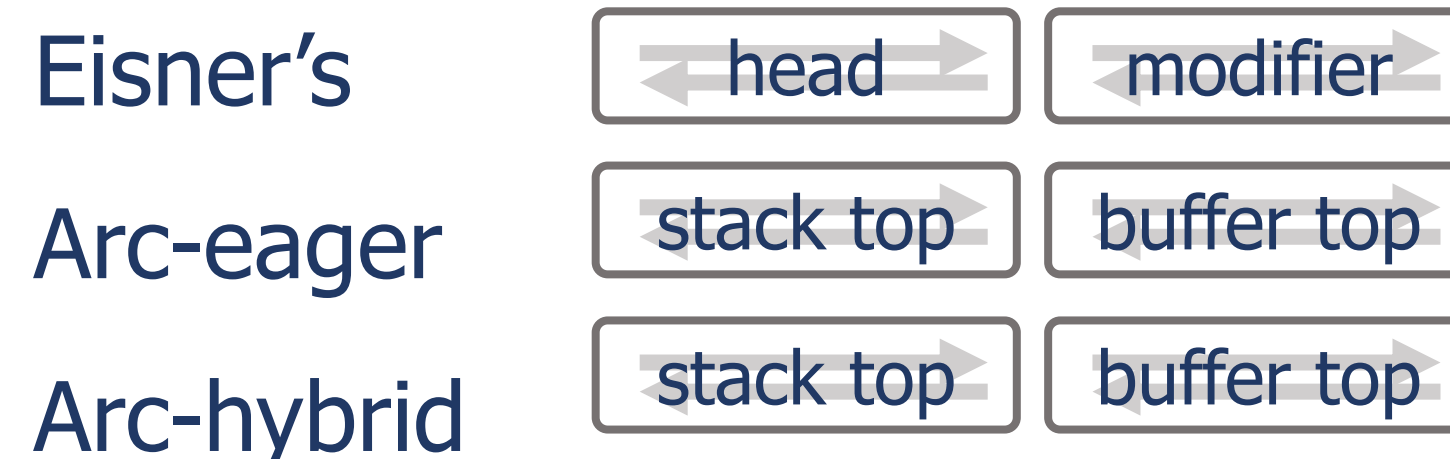
Official Ranking

Big Treebanks	2
Small Treebanks	1
PUD Treebanks	2
Surprise Languages	1
Overall	2

Global Transition-base Parsing

- $O(n^3)$ Exact decoders
 - Large-margin *global* training
 - Dynamic programming
- (Huang and Sagae, 2010; Kuhlmann, Gómez Rodríguez and Satta, 2011)

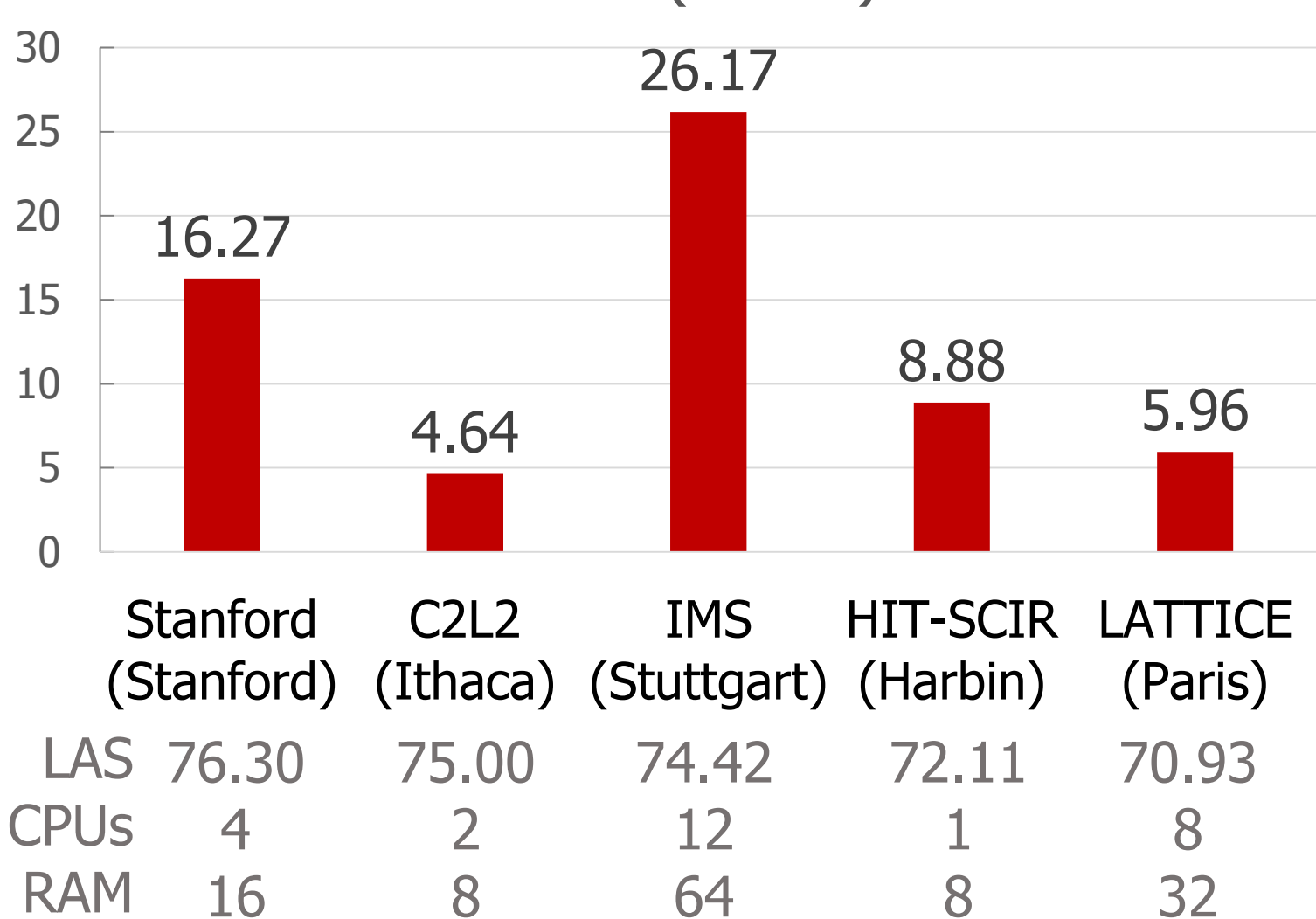
Compact Feature Set



Scoring function: deep bi-affine (Dozat and Manning, 2017)

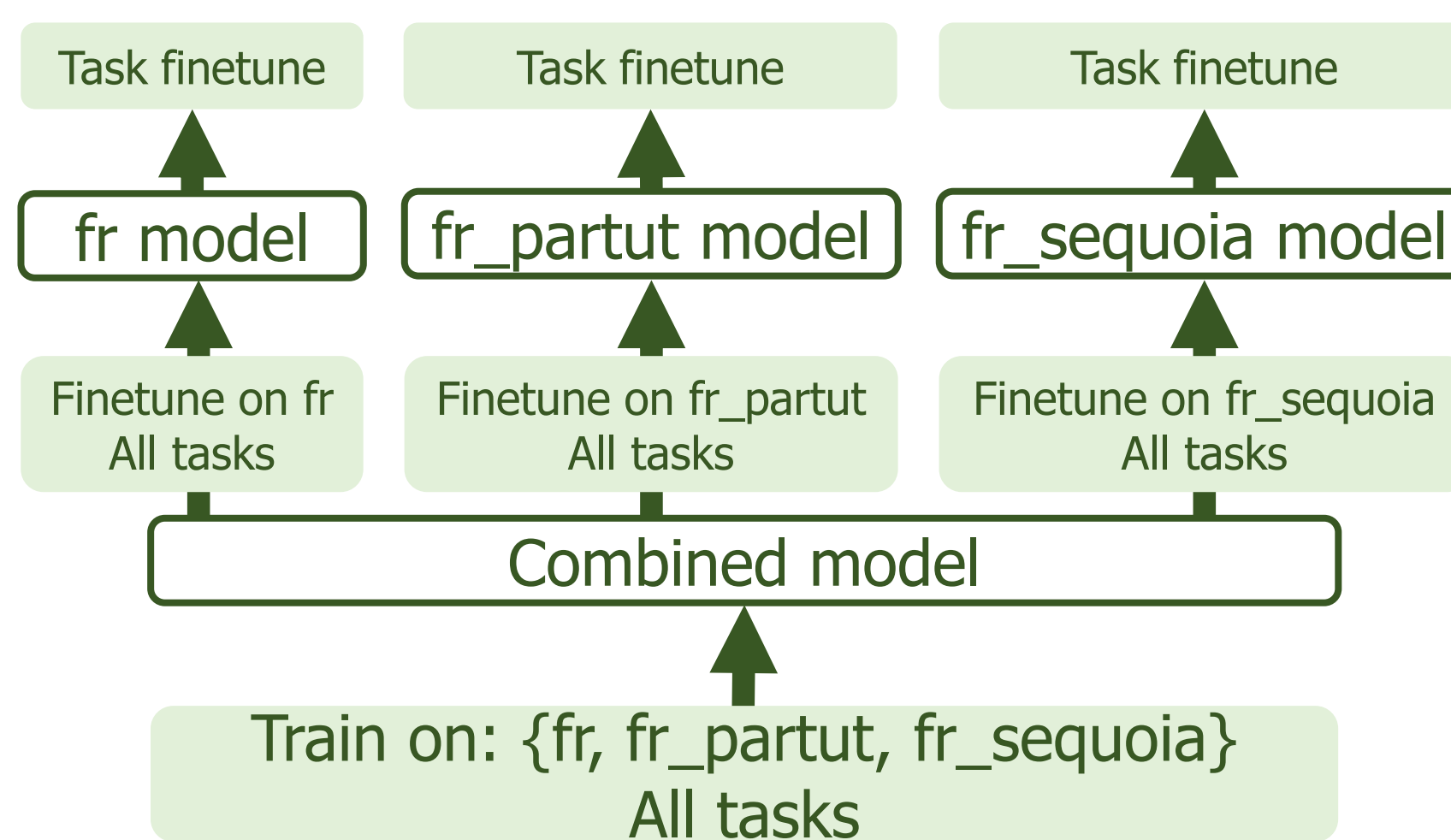
Efficiency

Runtime (Hours) *



* Not Benchmark Results

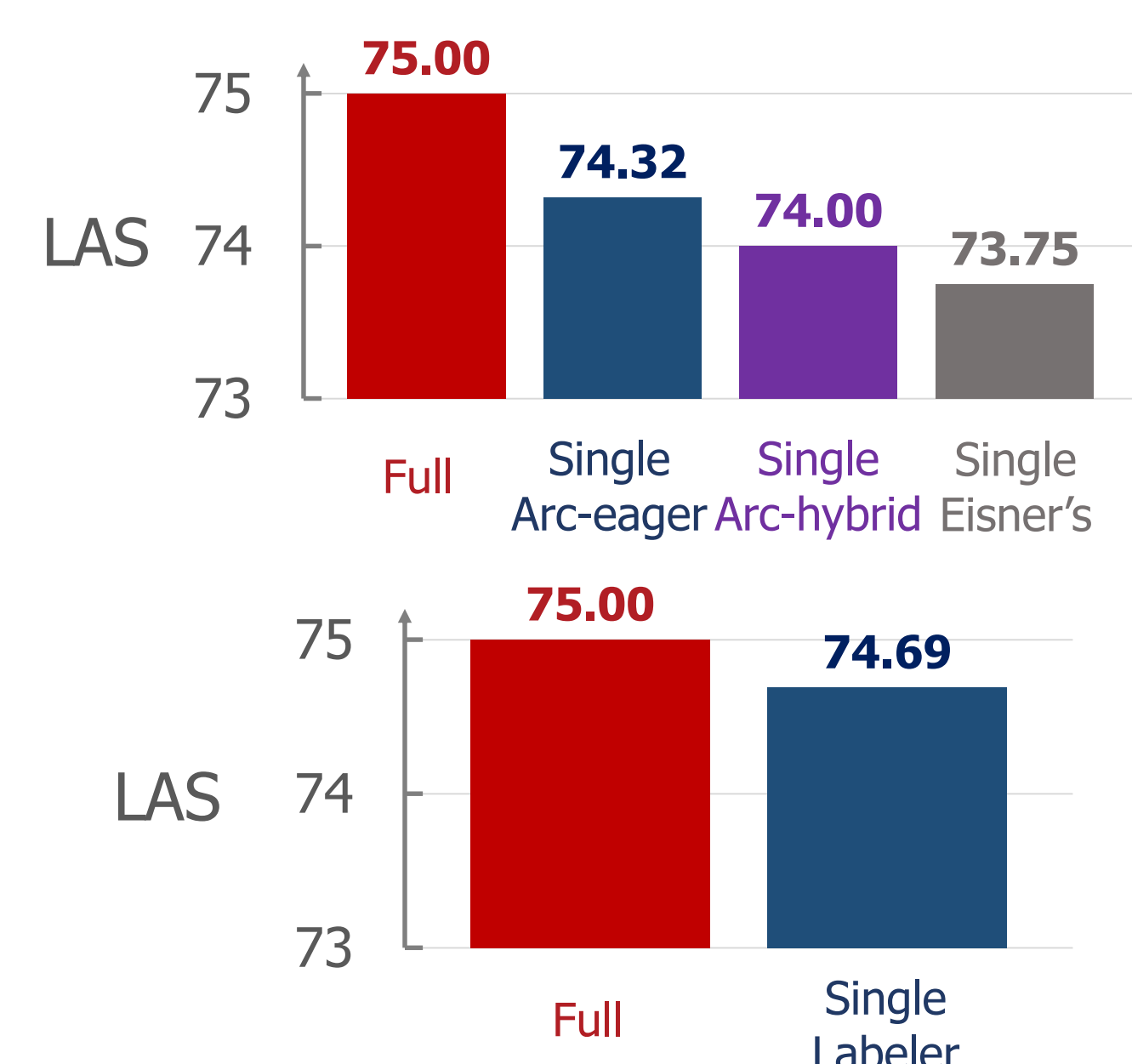
Parsing Small Treebanks



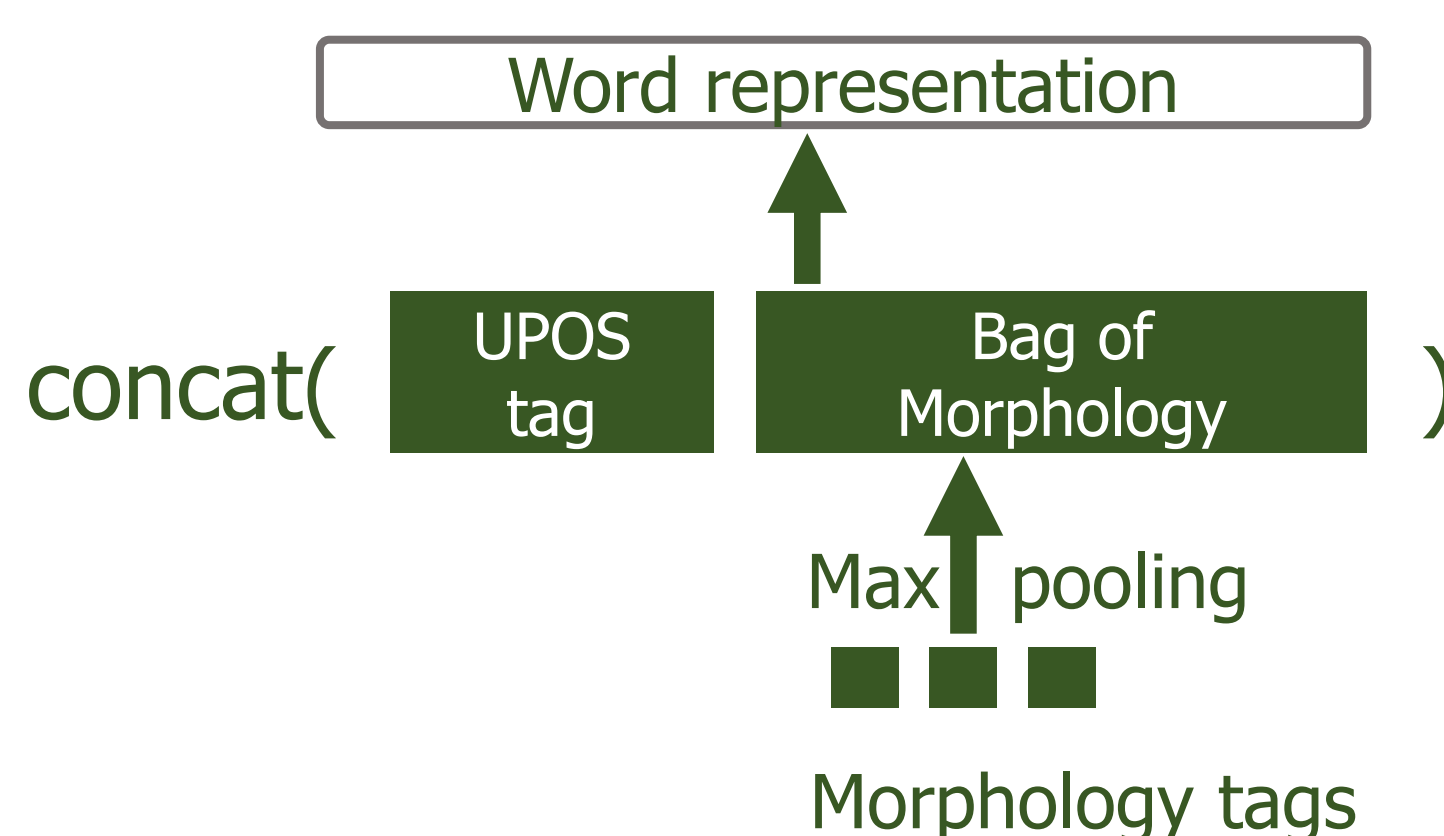
Train Treebank	Test Treebank		
	fr	fr_partut	fr_sequoia
fr	84.09		
fr_partut		79.53	
fr_sequoia			84.65
Combined	87.57	85.57	82.80
+Finetune	87.87	86.65	86.37

* UAS results on dev set, using gold segmentation

Ensemble Results



Parsing Surprise Languages



Target	Source	Ranking
Buryat	Hindi	2
Upper Sorbian	Czech	1
Kurmanji	Persian	1
North Sámi	Finnish	1
Average		1

Acknowledgements

TS was supported by a Google focused research grant. FW was supported by Kilian Q. Weinberger with IIS-1550179, IIS-1525919, IIS-1618134 grants from National Science Foundation. YC was supported by DARPA DEFT Grant FA8750-13-2-0015. We thank Lillian Lee for her helpful input and support throughout the shared task. And we thank the two anonymous reviewers for their valuable comments.