THE PERSIAN DEPENDENCY TREEBANK MADE UNIVERSAL

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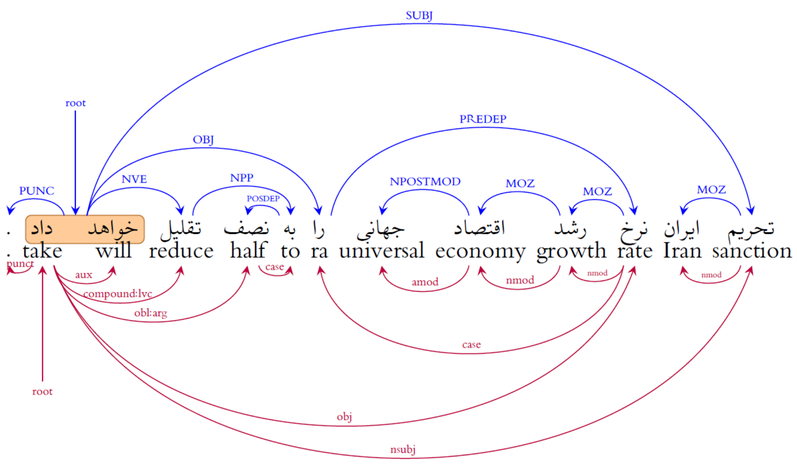
INTRODUCTION

Goal: Automatic conversion of PerDT (a none-UD Persian Dependency treebank with 29K sentences) to its UD version.



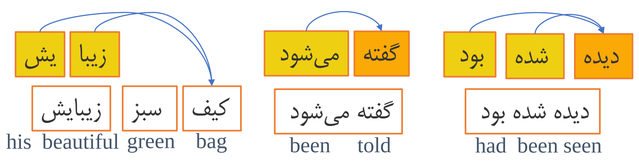
OUR APPROACH

Taking following steps:

- Token unification
- POS mapping
- Syntactical changes to main corpus
- Dependency mapping

TOKEN UNIFICATION

Separating multiword infections or attached clitics:

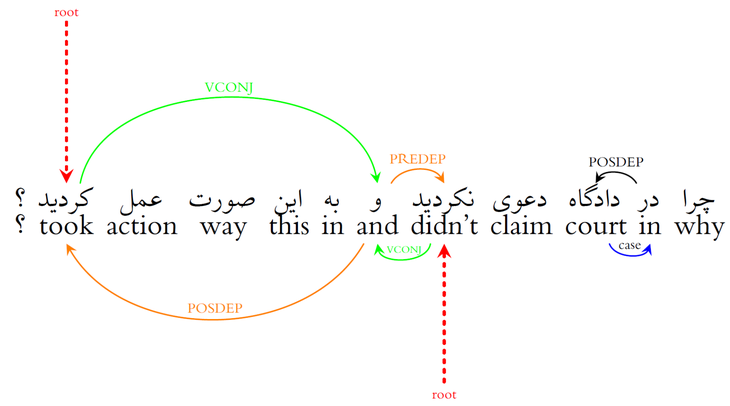


POS MAPPING

- NER tagging for Proper Nouns
- Correcting some POS tags & mapping

SYNTACTICAL CHANGES

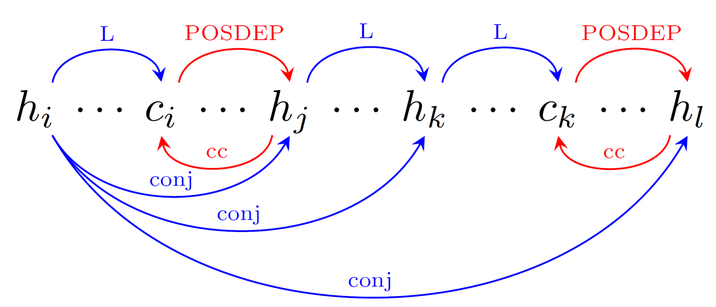
- Reversing order of verbal conjunctions



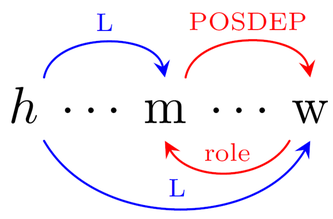
- Systematic & manual corrections to PerDT:
  - Lemma: 0.7% correction
  - Dependency head: 5.6% correction
  - Dependency label: 3.8% correction

DEPENDENCY MAPPING

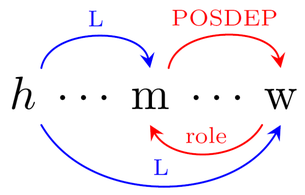
Applying rules with specific order:



(a) Conj Rotation



(b) CMR (role)
CMR: case/mark rotation



(c) NPP rotation

EXPERIMENTS

Supervised parser

Training UDPipe V.2 with fastText embeddings on both our data & the only previous Persian UD corpus (Seraji)

Results:

- Trained & tested on our corpus: **85.2** (LAS)
- Trained & tested on Seraji: 79.4 (LAS)
- Trained on ours/tested on Seraji: 61 (LAS)
- Trained on Seraji/tested on ours: 62.6 (LAS)

Delexicalized model transfer

Using delexicalized parser transfer to test consistency of our corpus & Seraji with UD project:

- Sampling the same number of tokens as Seraji from our corpus.
- Delexicalizing both of them
- Learning Yara Parser with 15 epochs
- Evaluating on delexicaled test set of the Universal English Web Treebank

Results:

Training Data	UAS	LAS
Uppsalla Universal Treebank (Seraji)	45.37	36.42
Our corpus	**47.31**	**38.59**