

# BME-HAS System for CoNLL-SIGMORPHON 2018 Shared Task: Universal Morphological Reinflection

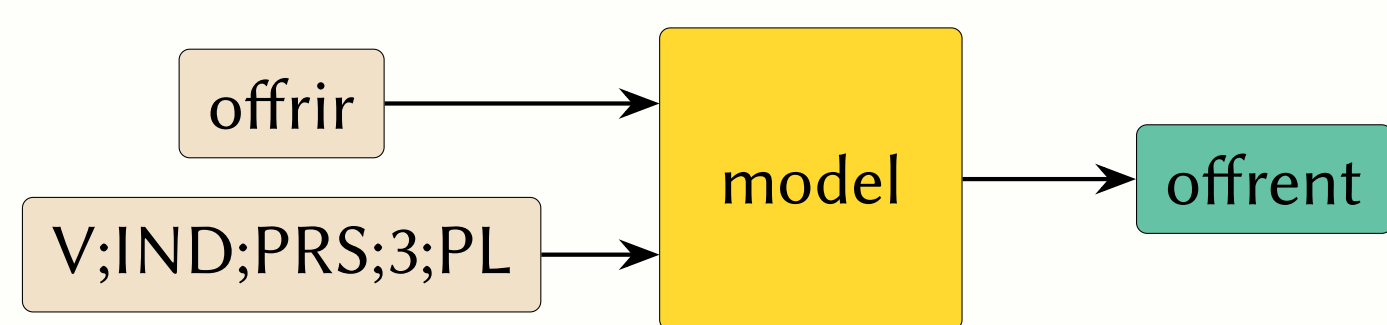
## How far can we go without data augmentation?

github.com/juditacs/deep-morphology  
 github.com/juditacs/sigmorphon2018  
 train\_replica.py replicates the same experiments

## Overview

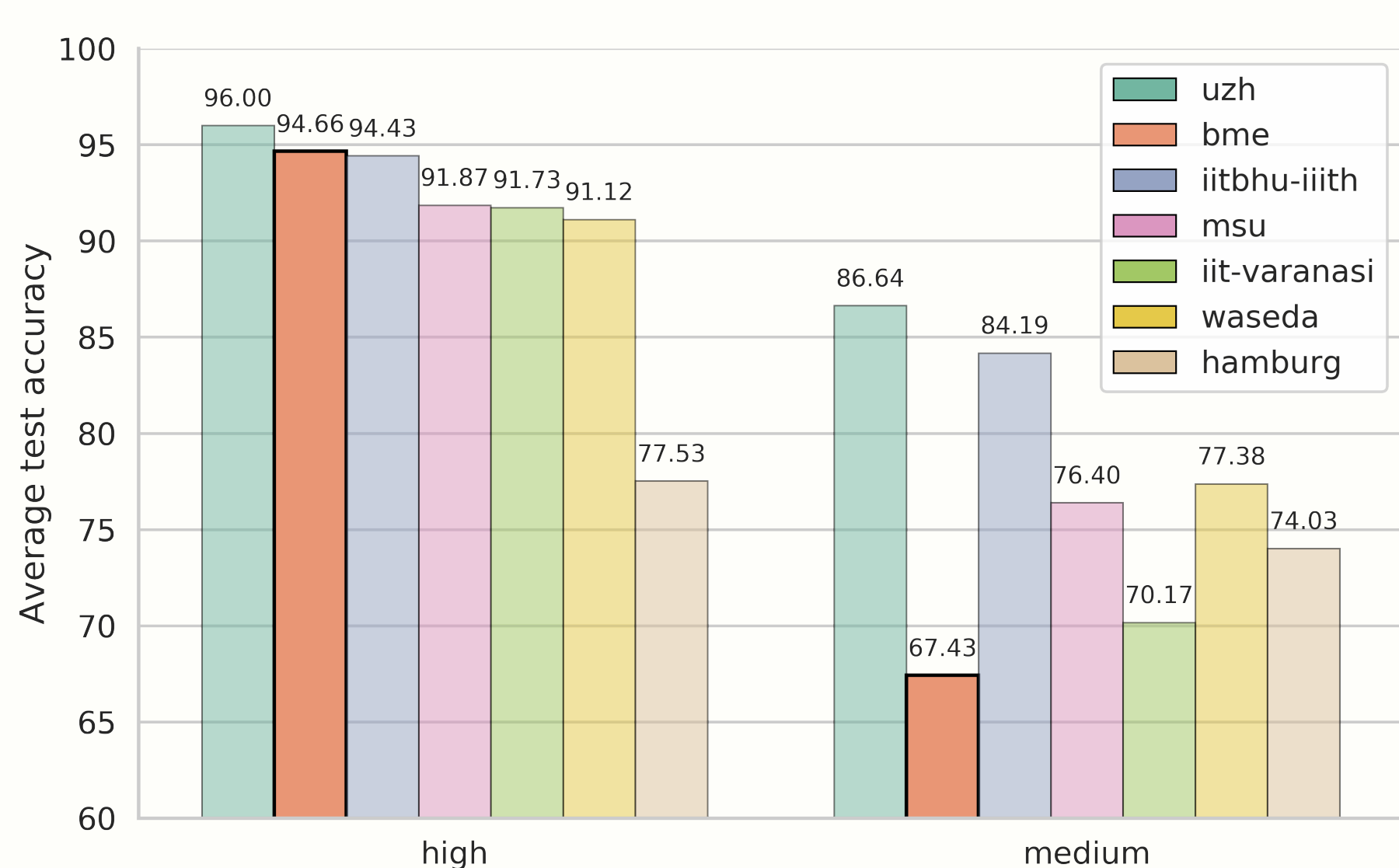
- ▶ Character-level seq2seq models for both tasks
- ▶ No data augmentation
- ▶ Large-scale random parameter search
- ▶ 2nd place in Task1 high setting
- ▶ 2nd place in Task2, both tracks, all settings

## Task1: Type-level inflection



- ▶ Given a lemma and a list of target tags, predict the inflected form.
- ▶ 103 languages
- ▶ High (10 000), medium (1 000) and low (100) training samples (types)

## Task1 results – top 7 teams



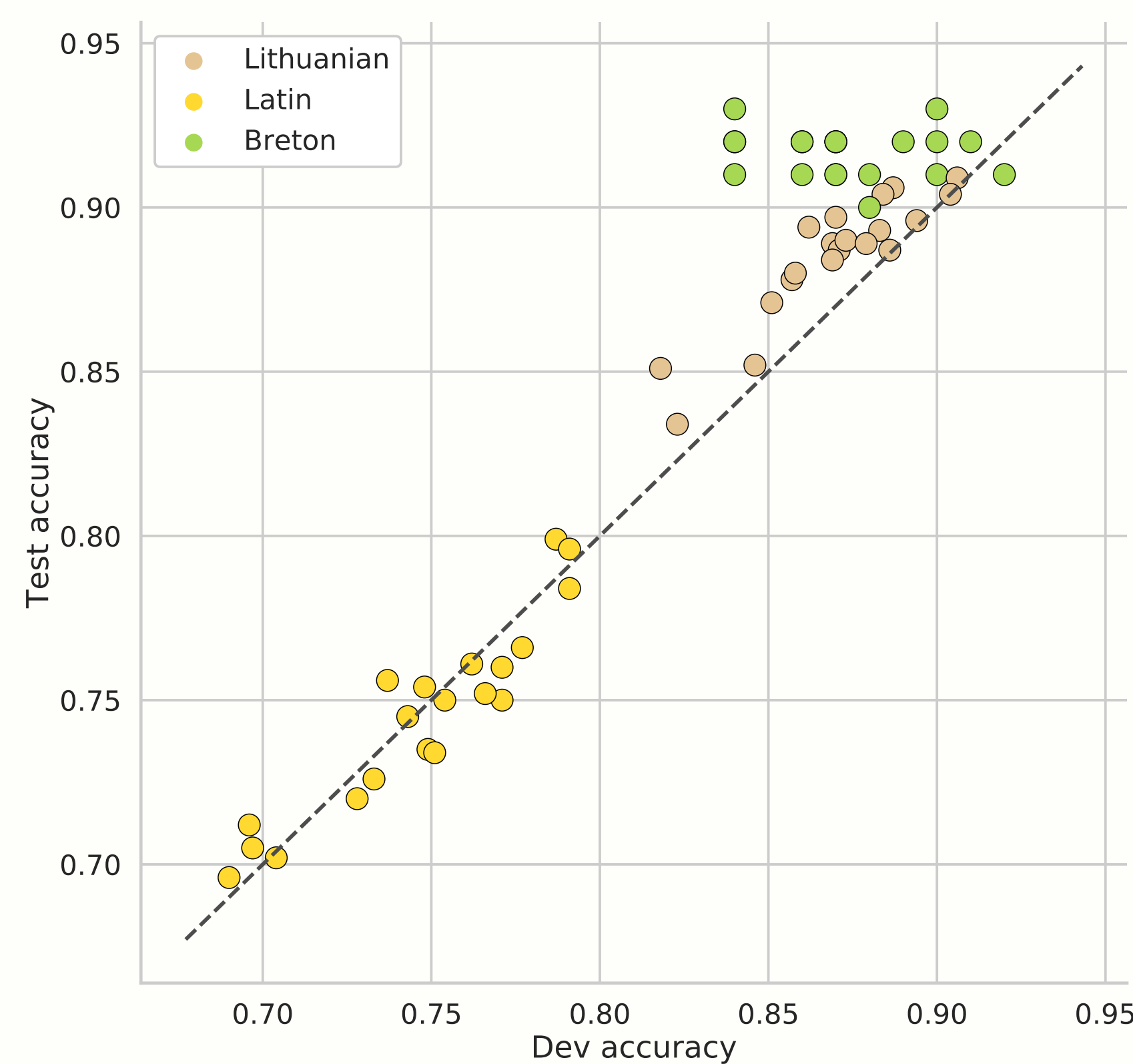
## Task1: Random parameter search

- ▶ Random parameter search
- ▶ Three languages: Breton, Latin, Lithuanian
- ▶ 1 886 experiments
- ▶ 5 best configuration per language run on every language and data size
- ▶ 15 models per language and data size

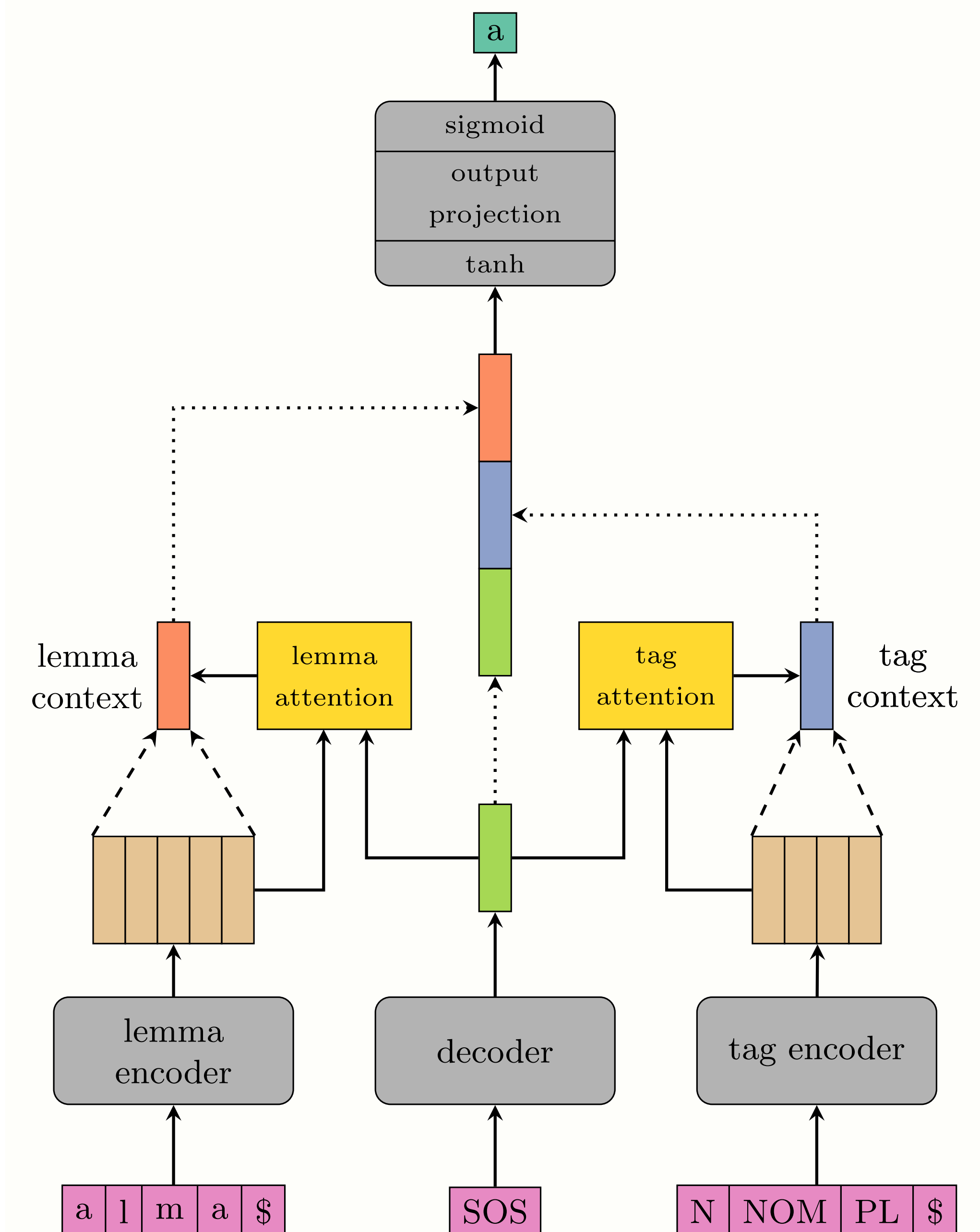
Parameter	Values
dropout	0.1, 0.3, 0.4, 0.6
share vocab	true, false
inflected embedding size	10, 20, 30, 50
inflected hidden size	128, 256, 512, 1024
inflected num layers	1, 2
lemma embedding size	10, 20, 30, 50
lemma hidden size	128, 256, 512, 1024
lemma num layers	1, 2, 3, 4
tag embedding size	5, 10, 20
tag hidden size	64, 128, 256
tag num layers	1, 2, 3, 4

## Effect of random initialization

Dev and test accuracy of models with identical parameters but different random seed.



## Task1: Two-headed attention



## Task2: Inflection in context

- ▶ High (appr. 100 000), medium (10 000) and low (1 000) tokens in the training data
- ▶ 2 tracks
- ▶ 7 languages (de, en, es, fi, fr, ru, sv)

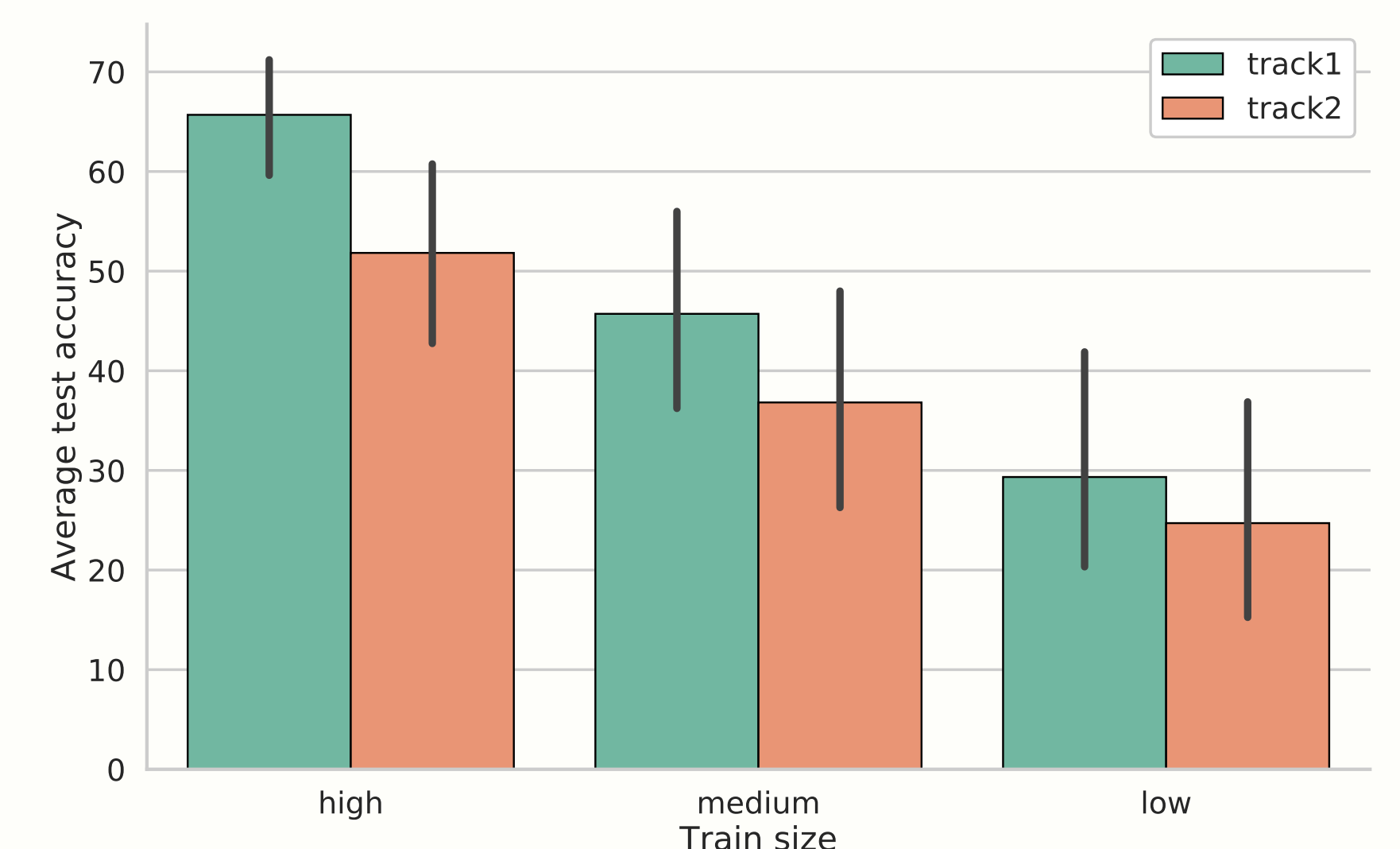
### Track1

Les	le	DET;DEF;FEM;PL
compagnies	compagnie	N;FEM;PL
aériennes	aérien	ADJ;FEM;PL
à	à	ADP
bas	bas	ADJ;MASC;SG
coût	coût	N;MASC;SG
ne	ne	ADV;NEG
–	connaître	–
pas	pas	ADV;NEG
la	le	DET;DEF;FEM;SG
crise	crise	N;FEM;SG

### Track2

ne	–	–
–	connaître	–
pas	–	–

## Task2 results



## Task2 model

