Filling the Gap: Decoding of Word Embeddings for Generation of Coherent New Words

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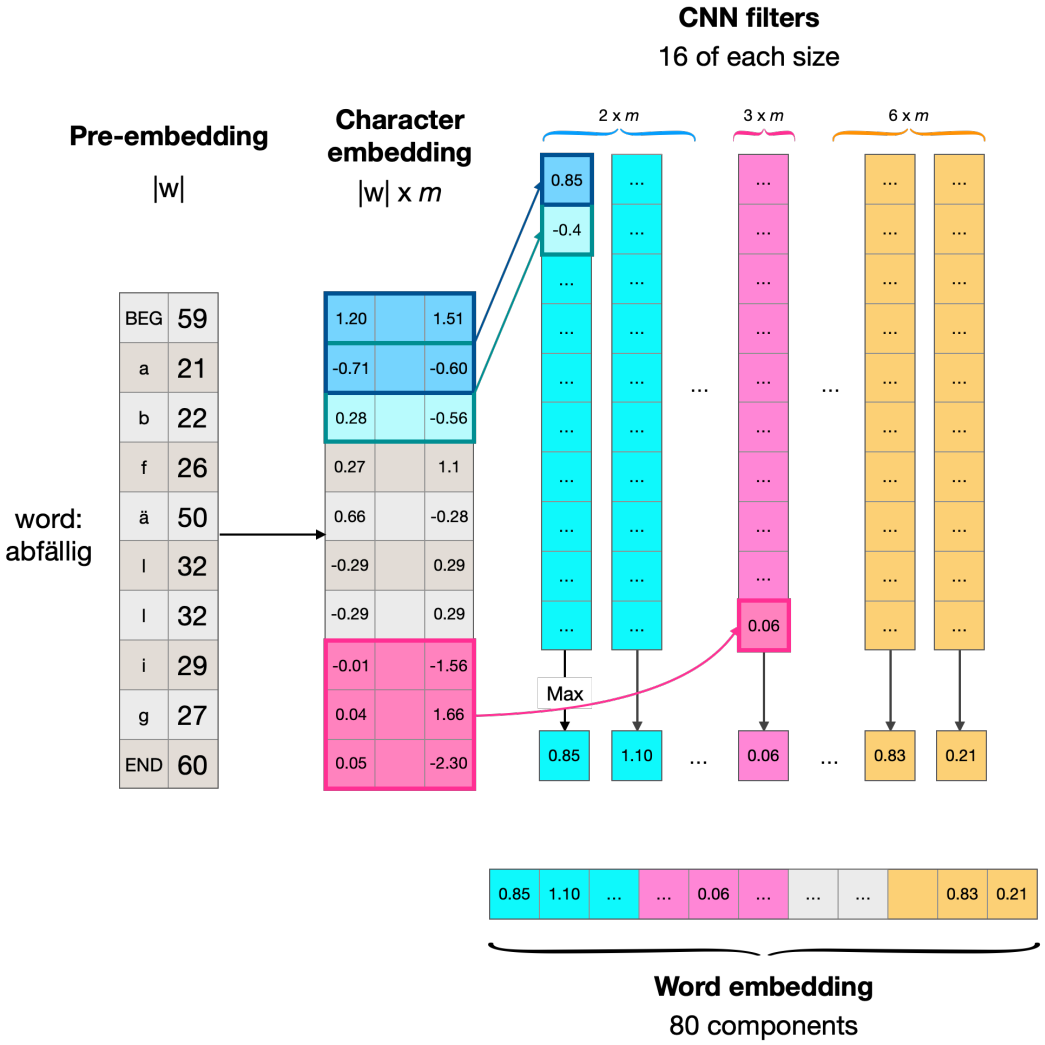
M2 – Software Project

What we want to work on

1. Build a decoder that transforms *embedded vectors* to *words*
2. Work on morphological inflection/derivation
   - root, affixes: prefixes, suffixes..
3. Apply it to 11 different languages
   - based on two datasets [Cotterell et al., 2016, Karpinska et al., 2018]
   - improve regression task
     - $A : B :: C : X \xrightarrow{X=?} A : B :: C : D$

Pre-existing embedding model



This model was inspired by [Kim et al., 2016]

Method

Datasets:

- SIGMORPHON 2016 [Cotterell et al., 2016] and the Japanese Bigger Analogy Test Set [Karpinska et al., 2018].

Tools:

- Python libraries (mainly PyTorch)
- Grid'5000

Our repository on Github:
`https://github.com/Safa-98/morphological_embeddings_decoder`

Our Approach

1. Initial intuition: find a method to reverse the embedding model
2. Usual decoders: RNN, GRU, LSTM
3. One possible approach: *Teacher Forcing*
   - `https://rajatvd.github.io/Generating-Words-From-Embeddings/`

Future Leads

1. Auto-encoder
2. Multilingual decoder/auto-encoder
3. Decoder based on subwords/morphemes
   - `https://github.com/colingoldberg/morphemes`

Where can it be applied?

- Analogy solving (educational application)
  - "play":"build"::"replay":$X \rightarrow X =$ "rebuild"
- General structure: apply to other types of data
- Multilingual model: underrepresented languages

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Thank you

Merci

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Obrigado

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