MorSeD: Morphological Segmentation of Danish and its Effect on Language Modeling

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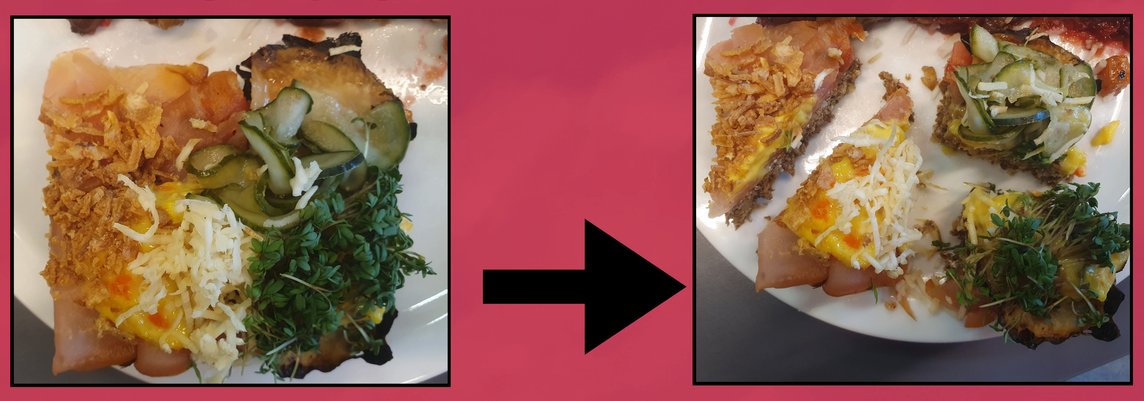
Morphological Segmentation

Converting words into morphemes (smallest meaning carrying units)



Smørrebrød → Smør-re-brød

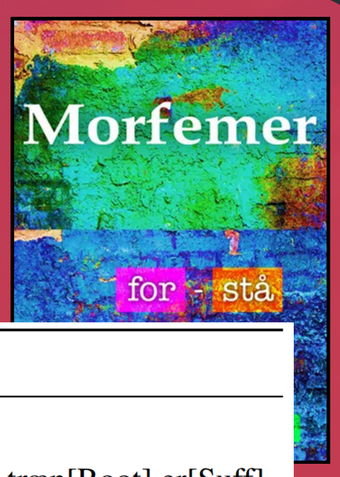
Why?

Language model use input units which are not linguistically motivated.

tænke -> t_æ_n_ke
luftpudefartøj -> lu_ftp_ude_f_art_ø_j

MorSeD

A Danish dataset annotated for morphological segmentation with the following categories:



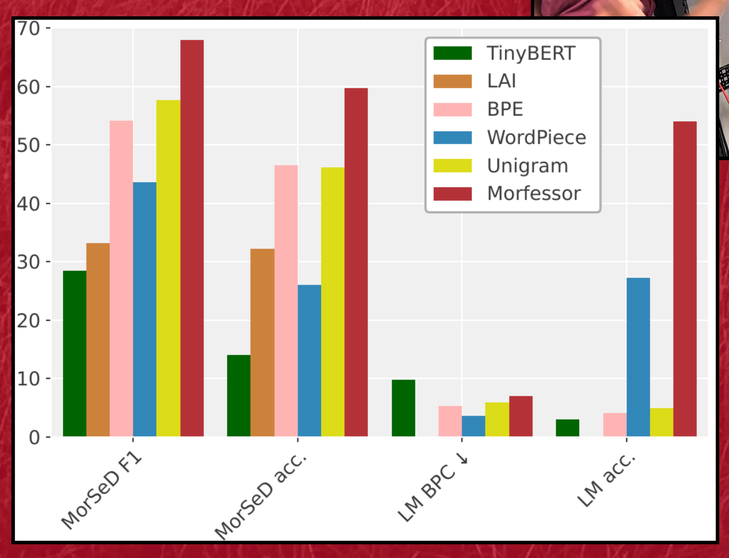
Word	Category	Split
Kranie	Root Morpheme	Kranie [Root]
Landstræner	Linking Morpheme	Land[Root] s[Link] træn[Root] er[Suff]
Lånte	Inflection	Lån[Root] te[Infl]
Bibringe	Prefix	Bi[Pref] bringe[Root]
Skoletaske	Compound	Skole [Root] taske [Root]
Venlig	Suffix	Ven[Root] lig[Suff]

Methods

Input:	måneraket	lærte
morsed:	måne-raket	lær-te
BPE:	må-ner-ak-et	lærte
WordPiece:	måne-rak-et	lærte
Unigram:	må-ne-rak-et	lærte
Morfessor:	måne-raket	lært-e
TinyBERT:	mane-rak-et	l-æ-rte

Input, gold, and output of segmentation algorithms, including popular subword segmentation algorithms, a morphological segmenter, and an English baseline.

Results



Scores for morphological segmentation (left), and language modeling (right).

Takeaways

- MorSeD: Wide coverage morphological segmentation dataset annotated by expert
- Subword algorithms do not correlate well with morphemes
- Language modeling (probably) improves when using units resembling morphemes

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https://bitbucket.org/robvanderg/morsed