Token-based MWE Identification Strategies in the mwetoolkit

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The mwetoolkit in a nutshell

- ▷ The toolkit: General-purpose collection of tools for the automatic **identification** and processing of **MWEs**;
- ▷ Previous functionalities: multilevel regex-like MWE **extraction**, efficient n-gram **counting**, **filtering**, **measuring** ...
- ▷ Motivation for this work: **lack** of **expressive patterns** limited what MWEs could be found, and the restricted alternatives for **corpus annotation** also lacked the ability to project back into source.

New: Expressive extraction patterns

```
<pat>  <!-- Finding past forms of "wake (up)" -->
  <w lemma="wake" pos="Verb">
     <neg surface="wake"/> <neg surface="wakes"/>
  </w>
  <pat repeat="?">
     <w surface="up"/>
  </pat>
</pat>
```

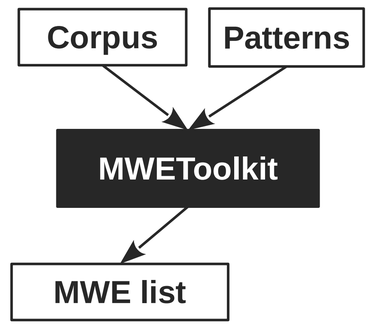
New: MWE in-corpus annotation

MWE extraction & annotation in corpora:

- ↪ Different gapping possibilities: contiguous, gappy;
- ↪ Different match distances: shortest, longest, all;
- ↪ Different match modes: overlapping or not;
- ↪ Annotation projecting back extracted MWEs;
- ↪ Annotation based on external lists of MWEs.

Extracting the pattern above from a POS-tagged corpus

In the **wake** of the war ⇒ ~~Nothing~~ (POS ≠ "Verb")
against the **woken** dragon ⇒ woken
a hero is **wakened up** again. ⇒ wakened up
The **woken** dragon is defeated ⇒ woken
but other dragons still **remain**! ⇒ ~~Nothing~~ (lemma ≠ "wake")
Do not **wake** them **up** ... ⇒ ~~Nothing~~ (surface = "wake")



Annotating a corpus with different match distances

Pattern **Verb (Word*) Particle**

- ○ Shortest: I have **picked** it **up** and **put** it **down**. ✓
- ○ Longest: I have **picked** it up and put it **down**. ✗

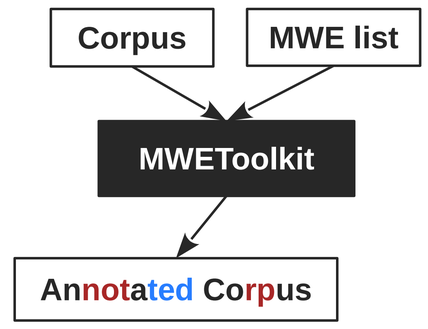
Pattern **Noun Noun$^+$**

- ○ Shortest: The **science fiction** writers are on strike. ✗
- ○ Longest: The **science fiction writers** are on strike. ✓

Annotating a corpus with gaps and overlapping MWEs

Using both patterns above

- ○ S+S: You **threw** all those **lab rat** tissue samples **out** without thinking! ✗
- ○ L+L: You **threw** all those **lab rat tissue samples** out **without** thinking! ✗
- ○ S+L: You **threw** all those **lab rat tissue samples out** without thinking! ✓



Future work

- ○ Consider surrounding context when annotating:
  1. The test was a **piece of cake**. ⇒ MWE
  2. I just ate a big **piece of cake**. ⇒ Non-MWE
- ○ Use sequence models to disambiguate MWE occurrences in the text (so that only idiosyncratic cases are annotated).
- ○ Define measures and implement tools to evaluate MWE annotation quality in corpora.

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