Error Correction Environment for the Polish Parliamentary Corpus

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The Polish Parliamentary Corpus

**In a nutshell:**

- an 800M-token collection of linguistically annotated documents from the proceedings of Polish Parliament (Sejm and Senate)
- prepared in a series of subsequently running projects (CESAR, CLARIN-PL, MARCELL, ParlaMint, CLARIN-PL-Biz)
- gathering proceedings between 1919 and now
- three main document types: stenographic transcriptions of plenary sittings, committee sittings and parliamentary questions
- data linguistically analysed and saved in stand-off XML TEI National Corpus of Polish format
- primary link: http://clip.ipipan.waw.pl/PPC
Data cleanup still needed

**Heterogeneous process of adding data to the corpus:**

- from almost-direct inclusion of newest born-digital data already available in clean formats
- to tedious correction of automatically OCR-ed image-based PDF files containing older materials

**Still many problems with the data:**

- structural errors (such as unmarked speakers, enumerations, comments or retained unnecessary header information)
- typographical errors (punctuation errors, various misspellings)
- other errors (non-textual elements, HTML fragments etc.)
The solution

**A new proofreading round:**

- with pre-detected errors (how?)
  - with a language-based model?
  - with custom rules?
- in some (new?) error correction environment
  - easy to use by non-technical users (XML-based?)
  - how to consult the source?
Error candidate detection

Two experiments:

1 language model-based:
   - a sequence to sequence model using plT5 model for Polish
   - successful in discovering and correcting such cases as two words glued together, missing or excessive spaces and several types of grammatical errors
   - still, the number of false positives rendered its use impractical

2 rule-based:
   - very precise
   - composed of several modules corresponding to various error categories
Rule-based solution

Detected error types:

- **structural errors**: mostly merged enumerations or speaker names treated as normal text
- **comments and metadata** marked in original texts with simple brackets leading to many conversion errors
- **punctuation errors**, e.g. unmatched quotation marks or brackets, excessively hyphenated words etc.
- **broken or unfinished paragraphs** resulting from conversion errors or signalling missing content
- **misspellings** resulting in OOV words → use dictionary
- **common OCR errors or typos** resulting in highly improbable in-dictionary words → use frequency lists
- **other errors**, e.g. remains of non-textual elements such as tables or footnotes, characters outside the common character set or spaced-out words
A new Web-based correction environment

https://korektor.rudolf.waw.pl
PDF page viewer add-on

An idea for a subproject:

- take a ’dirty OCR’ of the original graphical source PDF
- compare it with the clean XML text of a transcript
- insert page boundary markers in the XML

Components:

- Tesseract OCR engine
- word on page boundaries compared with Levenshtein distance
- compensation mechanisms for special cases:
  - pages containing tables (previously removed from the corpus XML files)
  - hyphenated words at the end of the page
Detected errors

In the whole data set:

<table>
<thead>
<tr>
<th>Error Type</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>All detected errors</td>
<td>778,479</td>
</tr>
<tr>
<td>Punctuation errors</td>
<td>427,830</td>
</tr>
<tr>
<td>Broken or unfinished paragraphs</td>
<td>121,182</td>
</tr>
<tr>
<td>Misspellings</td>
<td>116,997</td>
</tr>
<tr>
<td>Structural errors</td>
<td>71,790</td>
</tr>
<tr>
<td>Comments and metadata</td>
<td>18,452</td>
</tr>
<tr>
<td>Other errors</td>
<td>40,680</td>
</tr>
</tbody>
</table>
## Corrected errors

### Until now:

<table>
<thead>
<tr>
<th>Category</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>All corrections</td>
<td>606,506</td>
<td>100%</td>
</tr>
<tr>
<td>Suggestion-based</td>
<td>344,929</td>
<td>57%</td>
</tr>
<tr>
<td>Newly introduced</td>
<td>261,577</td>
<td>43%</td>
</tr>
<tr>
<td>Structural (crossing paragraphs)</td>
<td>522,064</td>
<td>86%</td>
</tr>
<tr>
<td>Textual (inside a paragraph)</td>
<td>84,442</td>
<td>14%</td>
</tr>
</tbody>
</table>
Thank you!

And several funding institutions and helpful friends:

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