CzEng 0.7: Parallel Corpus with Community-Supplied Translations

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Outline of the Talk

- Processing pipeline.
- Data sources and licences.
- Community-supplied data:
  - Analysis of quality,
  - Utility for machine translation.
- Future plans.
Text Processing in CzEng 0.7

- Converted data from multitude of input formats, . . . HTML, PDF, Palm text, SGML, PO etc.
- Fixed some systematic errors due to the origin of the documents, . . . e.g. end-of-line hyphens, spaces in words.
- Removed some parts without counterpart in the corresponding translated/original document,
- Tokenized both Czech and English sides,
- Segmented documents into sentences,
- Aligned Czech and English sentence.
- All text processing done automatically, no manual annotation.

CzEng 0.7 now available in a uniform XML format (or a plaintext dump).
Tokenization & Segmentation: TextSeg

Both Czech and English handled by TextSeg by Pavel Češka:

- Decision tree based on 17 context attributes,
- Trained on manually processed data.

Evaluation of sentence segmentation (for Czech):

- 1,000 occurrences of tokens that can indicate the end of sentence
  ... full-stop, hyphen, question mark, closing bracket, newline symbol.
- Evaluated against human judgements:
  Does the end of sentence coincide with the given token?
  → accuracy 98.4% on this set.
Sentence Alignment

- Hunalign to align pairs of segmented and tokenized documents.
- Taking advantage of the documents’ structure where possible.
  ... esp. community-supplied data often in pre-aligned segments.

Distribution of alignment types, English-Czech:

<table>
<thead>
<tr>
<th></th>
<th>1-1</th>
<th>2-1</th>
<th>0-1</th>
<th>1-2</th>
<th>1-0</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Count</td>
<td>1,096,940</td>
<td>68,856</td>
<td>63,185</td>
<td>43,057</td>
<td>30,694</td>
<td>33,123</td>
</tr>
<tr>
<td></td>
<td>82.1%</td>
<td>5.2%</td>
<td>4.7%</td>
<td>3.2%</td>
<td>2.3%</td>
<td>2.5%</td>
</tr>
</tbody>
</table>
Texts in CzEng 0.7

Legal texts:
- Acquis Communautaire Parallel Corpus
- The European Constitution proposal from the OPUS corpus
- samples from the Official Journal of the European Union

Stories and Commentaries:
- Readers’ Digest stories
- e-books: Project Gutenberg and Palmknihy.cz and a subset of the Kačenka parallel corpus
- articles from Project Syndicate

User-supplied data: not always complete sentences
- Czech localization of KDE and GNOME open-source projects
- user-contributed translations from the Navajo project

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## Texts in CzEng 0.7 – Data Sizes

<table>
<thead>
<tr>
<th>Source</th>
<th>Sentences</th>
<th>Tokens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acquis Communautaire</td>
<td>64.1%</td>
<td>69.0%</td>
</tr>
<tr>
<td>Readers’ Digest</td>
<td>8.6%</td>
<td>8.6%</td>
</tr>
<tr>
<td>Project Syndicate</td>
<td>6.5%</td>
<td>8.9%</td>
</tr>
<tr>
<td>KDE Messages</td>
<td>6.2%</td>
<td>1.9%</td>
</tr>
<tr>
<td>GNOME Messages</td>
<td>5.7%</td>
<td>1.9%</td>
</tr>
<tr>
<td>Kačenka</td>
<td>4.2%</td>
<td>4.9%</td>
</tr>
<tr>
<td><strong>Navajo User Translations</strong></td>
<td>2.3%</td>
<td>2.1%</td>
</tr>
<tr>
<td>E-Books</td>
<td>1.2%</td>
<td>1.6%</td>
</tr>
<tr>
<td>European Constitution</td>
<td>0.8%</td>
<td>0.7%</td>
</tr>
<tr>
<td>Samples from European Journal</td>
<td>0.4%</td>
<td>0.5%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1.4 mil.</strong></td>
<td><strong>21 mil.</strong></td>
</tr>
</tbody>
</table>

Community-supplied data in bold.
Licencing Issues

- Much more data are available on the Internet,
- Only a fraction can be repackaged and distributed.

<table>
<thead>
<tr>
<th>Source of Texts and Translation</th>
<th>Tokens Available</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>cs</td>
</tr>
<tr>
<td>Community Translation of Proprietary Texts</td>
<td>19.5M</td>
</tr>
<tr>
<td><strong>Professional</strong></td>
<td>21.3M</td>
</tr>
<tr>
<td>Proprietary</td>
<td>9.6M</td>
</tr>
<tr>
<td><strong>Community</strong></td>
<td>1.2M</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>51.6M</td>
</tr>
</tbody>
</table>

CzEng 0.7 ≈ Professional + Community sources; in bold
The Navajo Project

- An effort of a Czech MT system vendor to improve the quality of their product by means of using a community-supplied corrections of their translation of English Wikipedia to Czech.

- Both sides freely available. (“free” as in “free speech”)

- The users (translators) are anonymous.

- About 2,000 segments generated each month.

- CzEng 0.7 contains 30,208 translations of various parts of 3,724 Wikipedia articles.

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Quality of Navajo User Translations

The contributors’ anonymity rises doubts about the quality of their work.

Manual evaluation of 1,000 randomly selected segments:

<table>
<thead>
<tr>
<th>Translation Quality</th>
<th>Proportion in the Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>precise, flawless</td>
<td>69.0%</td>
</tr>
<tr>
<td>not translated</td>
<td>6.8%</td>
</tr>
<tr>
<td>incomplete</td>
<td>6.6%</td>
</tr>
<tr>
<td>imprecise</td>
<td>5.8%</td>
</tr>
<tr>
<td>precise, almost flawless</td>
<td>4.5%</td>
</tr>
<tr>
<td>machine-generated</td>
<td>4.4%</td>
</tr>
<tr>
<td>vandalism</td>
<td>2.7%</td>
</tr>
<tr>
<td>other</td>
<td>0.2%</td>
</tr>
</tbody>
</table>
Community-Supplied Translations (2/2)

KDE and GNOME Localizations

- Two major open-source software projects,
- Contributors **not** anonymous $\Rightarrow$ the quality considerably higher (almost professional)
- Only rarely full sentences, mostly short system messages and user interface elements e.g. “OK”, “Yes” or “Delete file”
Achievable MT Quality Using CzEng

Evaluation in-domain vs. out-of-domain.

Disjoint sections of training data:
- **D** professional, in-domain
- **P** professional, out-of-domain
- **C** community
- **X** community translation, proprietary source

Observations within domain of **D**:
- **D** sufficient for BLEU score
- additional data reduce OOV

Observations outside domain of **D**:
- **CX** < **DP**
- **DCPX** best

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Summary and Future Plans

- CzEng 0.7 (1.5M sents) available for research and educational purposes.
- Anonymous community generates huge data.
  - The main issue is unresolved copyright issues.
  - Quality seems reasonable (70% ok), given the zero cost.

Future plans with CzEng:

- Satisfied users.
  - e.g. ACL Workshop on Machine Translation 2007 and 2008 shared tasks.
- Include more texts.
  - Considering the idea of releasing everything (shuffled).
- Automatic annotation up to deep syntactic level.
- Designate subsections as development and evaluation data sets for MT.
  - ...properly cleaned-up.

http://ufal.mff.cuni.cz/czeng/

May 28, 2008  CzEng 0.7