Language Dynamics in the Dutch Golden Age
linguistic and socio-cultural aspects of intra-author variation

Feike Dietz, Marjo van Koppen
Jorik van Engeland, Cora van de Poppe, Marijn Schraagen

Project overview

- 16th and 17th century Dutch: linguistic variation and change
- This project: intra-author variation, i.e., variation within individual, influential language users
- Data: P.C. Hooft, Stevin, Coornhert, Vondel, …
- Approach: Use computational methods to allow large-scale search for morpho-syntactic structures, enabling systematic research into variation patterns
- Methodology:
  1. Corpus selection and cleaning
  2. Close reading for linguistic and literary analysis
  3. Identifying sociological features
     - location, genre, audience, gender, …
  4. Extracting morphological features
     - negation, case, infinitival clauses, …
- Direct method: use and improve tools for historical Dutch
- Indirect method: text modernization, tools for modern Dutch

1 Direct method: automatic and manual enrichment

Letter of P.C. Hooft [1] to the mayors of Muiden, June 18, 1609, asking to postpone the election for guard commanders. En is used both as conjunction and negation.

 [...] dat UE de keur en bevestinge der bevelhebberen over de schutterie gelegen sal wt te stellen ende op te houden tot op Sondach over acht daeghen werderden den achtentwintichsten dezer maendt. Ende alsoo bij deze wtstellinge niemandt en can wezen vercorct [...] that you please postpone the choice and confirmation of the commanders of the guard and hold off until Sunday in eight days, being the 28th of this month. And also with this delay nobody will be opposed

- Enrichment using the Adelheid tagger for Middle Dutch [2]:

<table>
<thead>
<tr>
<th>word</th>
<th>lemma</th>
<th>POS</th>
</tr>
</thead>
<tbody>
<tr>
<td>dat</td>
<td>dat</td>
<td>Art(def)</td>
</tr>
<tr>
<td>UE</td>
<td>vee</td>
<td>N(sing,forme)</td>
</tr>
<tr>
<td>.</td>
<td>.</td>
<td>Func(period)</td>
</tr>
<tr>
<td>de</td>
<td>te</td>
<td>Adp()</td>
</tr>
<tr>
<td>keur</td>
<td>eekhoorn</td>
<td>N(prop)</td>
</tr>
<tr>
<td>en</td>
<td>in</td>
<td>Adp()</td>
</tr>
<tr>
<td>bevestinge</td>
<td>bezating</td>
<td>N(sing,forme)</td>
</tr>
<tr>
<td>Ende</td>
<td>en</td>
<td>Conj(coord)</td>
</tr>
<tr>
<td>alson</td>
<td>alzo</td>
<td>Adv(gener)</td>
</tr>
<tr>
<td>bij</td>
<td>bij</td>
<td>Adp()</td>
</tr>
<tr>
<td>deze</td>
<td>deze</td>
<td>Art(def,forme)</td>
</tr>
<tr>
<td>wtstellinge</td>
<td>stalling</td>
<td>N(plu,forme)</td>
</tr>
<tr>
<td>niemandt</td>
<td>???</td>
<td>N(sing)</td>
</tr>
<tr>
<td>en</td>
<td>en</td>
<td>Adv(neg)</td>
</tr>
<tr>
<td>kan</td>
<td>kunnen</td>
<td>V(fin,pres,aux_cop)</td>
</tr>
<tr>
<td>wezen</td>
<td>zijn</td>
<td>V(infin)</td>
</tr>
<tr>
<td>vercorct</td>
<td>???</td>
<td>N(sing)</td>
</tr>
</tbody>
</table>

- Automatic tagging provides useful results
- Still many errors, manual correction desired
- In preparation: annotation correction sessions with newly developed tool

2 Indirect method: automatic modernization

- Modernization of spelling and grammar allows use of tools for modern Dutch
- Note: some features (e.g., negative concord and case marking) are lost after modernization
- Automatic conversion is possible using parallel text to train algorithms and construct a translation lexicon
- Relatively large parallel text available in diachronic translations of the Bible

1637: Verlost mij, o God! want de wateren zijn gekomen tot aan de ziel.
1888: Verlos mij, o God! want de wateren zijn gekomen tot aan de ziel.
Save me, O God; for the waters are come in unto my soul.

- Statistical Machine Translation using Moses [3]
- Alternative: start from scratch using various rule-based and machine learning-based approaches
  - Construct 1-to-1 translation lexicon using sentences of equal length
  - Perform alignment to handle sentences of unequal length
  - Compile a set of manual modernization rules (e.g., strip case markers)
  - Construct many-to-1 translation lexicon using aligned sentences
  - Use POS-information for already modernized words to choose the right alternative for historical words
    - haer + V → hen
    - haer + N → hun
  - Compile rules to address punctuation differences
- Results of both approaches are comparably accurate
  - BLEU score for evaluation of machine translation [4]
    - Moses: 0.61631 (corrected for capitalization: 0.63867)
  - From scratch: 0.62715
- Combination of approaches not straightforward
  - Sequential application leads to decreased performance
  - Translation results not applicable as input between approaches
  - Translation errors propagate
  - Exception: Moses + manual rules (0.64418)

References


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