Racism detection in Dutch social media posts
An exploratory study

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ATILA ’15
Contents

1. How to define racism?
2. Data Collection
3. Annotation
4. Classification
5. Results
How to define racism?

1. Belgian law
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   - Discrimination
   - Inciting hate
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2. Our definition
How to define racism?

1. Belgian law
   - Discrimination
   - Inciting hate

2. Our definition
   - Insults and generalizations
     - Skin color, ethnicity, nationality
     - Religion and culture
Data collection

1. Interfederal Centre for Equal Opportunities
2. Two public social media pages
   - Training set: 5759 comments
   - Test set: 616 comments
Annotation guidelines

Four labels:

1. Racist
   - “Weg met alle niet Westerse buitenlanders”
     “Away with all non-Western foreigners”

2. Context
   - “Ik ben het volledig met je eens”
     “I totally agree with you”

3. Non-racist

4. Invalid
Annotations

Three annotators: A, B & C

1. Training data
   - A and B annotated all posts
     - Agreement: 0.79, \( \kappa = 0.60 \)
     - C: tiebreaker

2. Test data
   - A, B & C annotated the posts
     - Agreement: 0.77, \( \kappa = 0.54 \) (125 posts)
     - C has low overlap with both A and B
Gold standard

<table>
<thead>
<tr>
<th></th>
<th>Train data</th>
<th>Test data</th>
</tr>
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<tbody>
<tr>
<td>Non-racist</td>
<td>4438</td>
<td>436</td>
</tr>
<tr>
<td>Racist</td>
<td>924</td>
<td>164</td>
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<tr>
<td>Invalid</td>
<td>335</td>
<td>9</td>
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<tr>
<td>Context</td>
<td>62</td>
<td>7</td>
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</tbody>
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For automatic classification: only **two** labels are kept
## Gold standard

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<tr>
<td>Non-racist</td>
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</tr>
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</tr>
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For automatic classification: only **two** labels are kept
Classifier

- Support Vector Machine algorithm
- Features:
  - Content-based
  - Stylistic
Content-based features

- Word (unigram and bigram) frequencies
- Dictionaries
  - LIWC dictionaries
    - *Linguistic Inquiry and Word Count*, Pennebaker
  - Racism dictionaries: manually extracted from train data
Categories

- Racist
- Neutral
- Skin color
  - Brown
  - Black
- Nationality
  - North-African
  - East-European
- Religion
  - Islam
  - Judaism
- Culture
- Clothing
- Animals
- Diseases
- Belgian
- Immigrant
- Natives
- Criminal
- Insults
- Race
- Country
- Stereotype
Stylistic features

- Average sentence and word length
- Vocabulary richness
- POS-tags
- Punctuation
- Character bigrams
- Chatspeak features: emoticons, etc.
Results

- Train set (tenfold cross-validation)
  - F-score 0.71 (+/- 0.05)
- Test set
  - F-score 0.66
  → Robust
- Baselines:
  - Weighted random baseline: 0.71
  - Majority baseline: 0.83
Figure: Precision, recall, and F1 for each class (test set)
Figure: Recall vs. corpus frequency for each class
Most relevant features: interpretation

Words (unigrams)

- Us/them discourse
  - 'hunne'
  - 'their'
- Insults, often concerning land of origin, religion...
  - 'ratten', 'zandbak', 'doctrine'
  - 'rats', 'sandpit', 'doctrine'
- Islamic culture
  - 'moslim'
  - 'Muslim'
Most relevant features: interpretation

Expressions (bigrams)

- **Us/them discourse**
  - 'onze cultuur', 'die islam'
  - 'our culture', 'that Islam'

- **Migration**
  - 'terug naar', 'eigen land'
  - 'back to', 'own country'
Relevance (current version of the) dictionaries?

1. Influence?
   - Predictable: derived from training data
   - Not much of a difference with or without dictionaries

2. Likely to generalize to unseen data?
   - Bound to our specific data

But: can be extended and optimized
Conclusion

1. Promising preliminary results:
   - Classifier reaches 0.66 f-score on test set
   - Quite robust

2. Important features:
   - Word counts (unigrams)
   - Word bigrams
   - Features concerning Islamic culture

3. Future work:
   - Optimization dictionaries
   - Experiments with word embeddings