Mapping the PERFECT via Translation Mining

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The PERFECT – the basics

- Morpho-syntax: *auxiliary (HAVE/BE) + past participle*
- Appears a.o. in German, English, Spanish, French, Dutch
- Core meaning: *past event + present state*.

1) Mary *has visited* Paris. [experiential]
   (her past visit to Paris is relevant now)
2) Mary *has moved* to Paris. [resultative]
   (she currently lives in Paris)
3) Mary *has lived* in Paris for five years. [continuative]
   (she moved there five years ago)

The PERFECT – current approaches

- Current approaches tend to look at the PERFECT in **isolation**:
  - They ignore variation within a language:
    - Competition with other tense-aspect forms in the grammar (in particular PAST and PRESENT)
  - They ignore variation between languages:
    - Same meaning can be conveyed by other tense-aspect forms

The PERFECT – our proposed analysis

- **Semantic maps** (Haspelmath 1997)
  - Allows to see variation within and between languages
- **But**: generate these directly from the data
- **Final goal**: compositional semantics of the PERFECT across languages

Data – multilingual parallel corpora

- Translation equivalents provide us with ***form variation*** across languages in contexts where the ***meaning is stable***.
- Genre variation through different corpora
  - This pilot: EuroParl (Tiedemann 2012)
  - OpenSubtitles (Tiedemann 2016)
  - Literary corpora (following de Swart 2007)

Translation Mining

- **Extraction of PERFECTS** from multilingual corpora
- **Word-level alignment** of verb phrases
- **Tense attribution** for translations
  - Discard 'other' translations (nominalizations, 'free' translations)
- Create a **dissimilarity matrix**
- **Multidimensional scaling** to project variation onto a semantic map

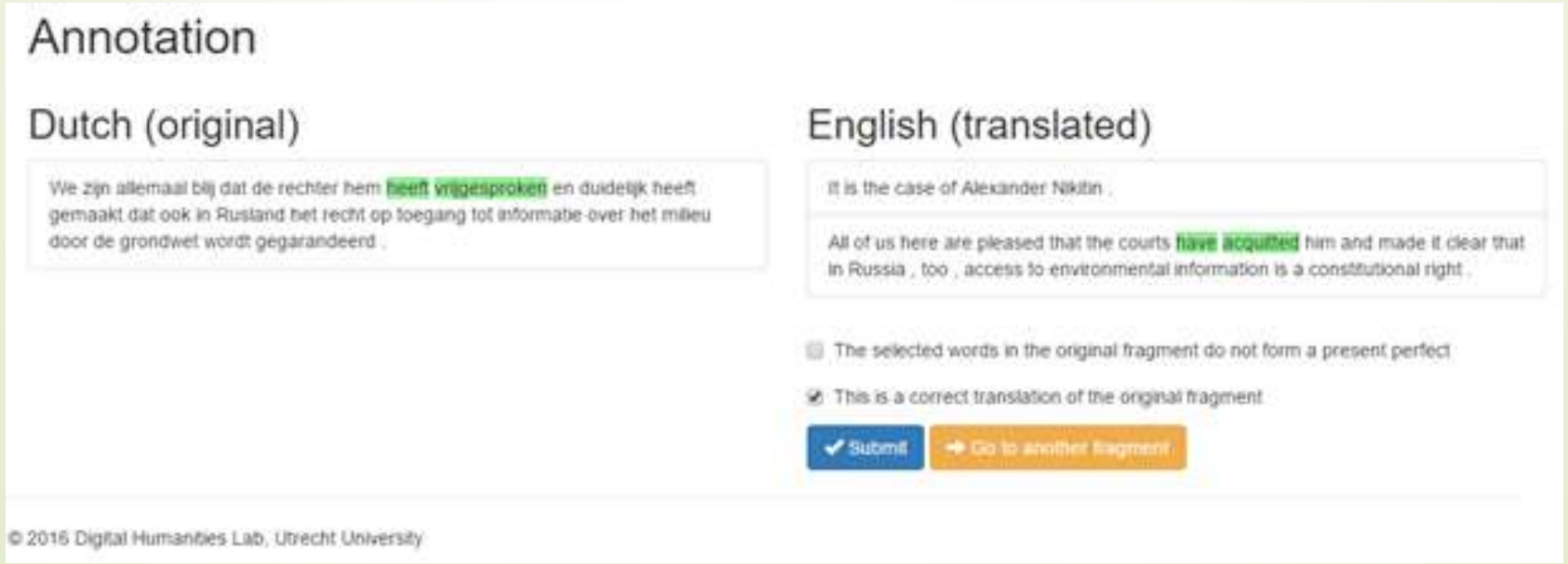
- *Methodology inspired on Wälchli & Cysouw 2012*

Step 1) Extraction of PERFECTS

- Stand-alone application: **PerfectExtractor**
- Simple principle:
  - Look for an auxiliary verb (HAVE/BE)
  - Find a neighboring past participle
- Takes care of words in between, lexical restrictions, reversed order, passive present perfects.
- Uses config files to discern between languages and corpora
- Source code on GitHub: https://github.com/UUDigitalHumanitieslab/time-in-translation

Step 2) Word-level alignment

- Web application: **TimeAlign**
- Allows for manual alignment of translations of PERFECTS.
- Source code on GitHub: https://github.com/UUDigitalHumanitieslab/timealign



Step 3) Tense attribution

- To allow for calculating distances between fragments, we need to assign a tense to every selected translation.
  - **Algorithm** for English, French and Dutch
  - **Manually** for German and Spanish
    - POS-tags do not discern between PRESENT and PAST tense for auxiliary verbs

Step 4) Dissimilarity matrix

- **Distance function**: we define a pair of source and translations to be maximally similar (d=0) if all tenses match up.

#	German	English	French	Spanish	Dutch
1	Perfekt	Present perfect	Passé composé	Pretérito perfecto conpuesto	Voltooid tegenwoordige tijd
2	Präterium	Simple past	Passé composé	Pretérito perfecto conpuesto	Voltooid tegenwoordige tijd
3	Perfekt	Present perfect	Passé récent	Pasado receinte	Voltooid tegenwoordige tijd

- $d(1, 2) = 2/5$, $d(1, 3) = 2/5$, $d(2, 3) = 4/5$

Step 4) Dissimilarity matrix

- Using our defined distance function, we can create a dissimilarity matrix.

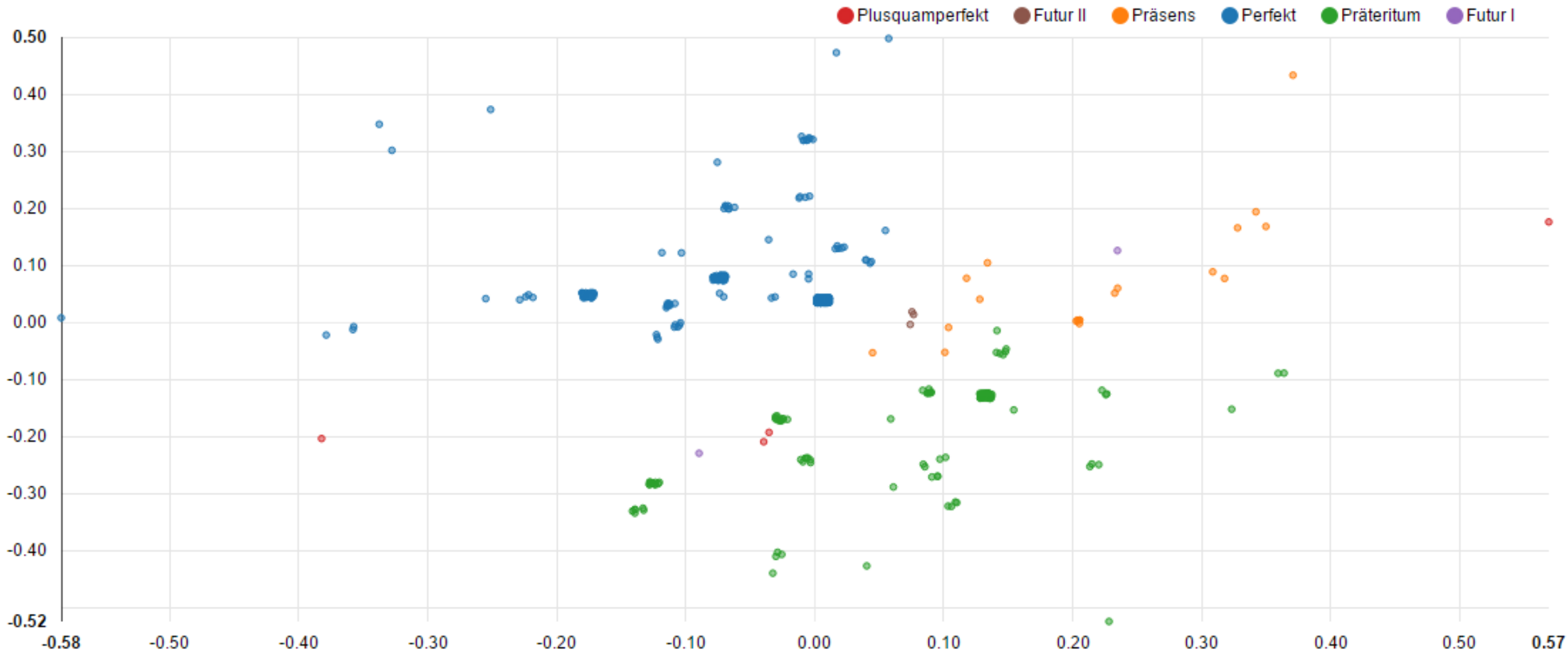
	#1	#2	#3
#1	-	2/5	2/5
#2	2/5	-	4/5
#3	2/5	4/5	-

Step 5) Multidimensional Scaling

- **Multidimensional scaling (MDS)** tries to create a low-dimensional representation of the data, while respecting distances in the original high-dimensional space.

Step 5) Multidimensional Scaling

- Web application: **TimeMapping**
  - Visualisazes the results of MDS on a scatter plot, we use the attributed tenses as labels.
- Friendly user interface:
  - Click/unclick tenses for filtering
  - Choose which dimensions of the MDS to show
  - Choose which language to show
  - Drill-through to raw data
- Source code on GitHub: https://github.com/UUDigitalHumanitieslab/timealign



Filters

Language: German English Spanish French Dutch

Dimension on x-axis: 1 2 3 4 5

Dimension on y-axis: 1 2 3 4 5

✔ Go!

Interpreting the maps

- Switching dimensions reveals two main contrasts:
  - Temporal orientation: PRESENT vs. PAST (high/low)
  - Aspectual perspective: PERFECT vs. SIMPLE (left/right)
- We are working on statistical analysis using ANOSIM (Clarke 1993) or non-parametric MANOVA (Anderson 2001)

Qualitative research (1)

- The maps show more **central** and more **peripheral** uses of the PERFECT
- We can investigate **outliers**
  - E.g. confirm that English requires a PAST with a *locating time adverbial*, whereas German, Dutch and French tolerate a PERFECT in this configuration. Spanish patterns with English (see Schaden 2009). Example on next page.

Dutch

ep-00-12-11.xml - 3552

Mevrouw de Voorzitter , op 4 december hebben wij hierover gestemd .

Translations

German

Perfekt

Frau Präsidentin , wir haben am 4. Dezember abgestimmt .

English

simple past

Madam President , we voted on 4 December .

Spanish

presente

Señora Presidenta , votamos el pasado 4 de diciembre .

French

passé composé

Madame la Présidente , nous avons voté le 4 décembre .

Qualitative research (2)

- We can look at **special verb forms**, and find out how other languages deal with them in a different tense-aspect grammar.
  - E.g. English *Present Perfect Continuous* has been claimed to translate as a PRESENT in French (cf. Nishyama & Koenig 2010) and Dutch.
  - But: German maintains a PERFECT in sentences that contain a *seit* ('since') adverbial. Note the special construction in Spanish.

German

ep-00-12-14.xml - 10491

Seit Monaten haben die Nachrichten von der Elfenbeinküste eine begründete Unruhe in der europäischen Öffentlichkeit und entsprechende Besorgnis in unserem Parlament hervorgerufen .

Translations

English

present perfect continuous

Mr President , for months the news from Côte d ' Ivoire has been causing justified alarm within European public opinion and the corresponding concern in our Parliament .

Spanish

pretérito perfecto compuesto

Señor Presidente , desde hace meses las noticias de Costa de Marfil han venido causando justificada alarma en la opinión pública europea y la correspondiente preocupación en nuestro Parlamento .

French

présent

Monsieur le Président , les nouvelles de la Côte-d'Ivoire suscitent depuis des mois l' inquiétude justifiée chez les citoyens européens et l' inquiétude correspondante au sein de notre Parlement .

Dutch

ott

Mijnheer de Voorzitter , sinds enkele maanden zorgen de berichten uit Ivoorkust terecht voor onrust in de Europese publieke opinie en voor overeenkomstige bezorgdheid in ons Parlement .

Qualititative research (3)

- Another **special construction** is the RECENT PAST in French/Spanish.
- Where French and Spanish use a RECENT PAST verb form, English, German and Dutch use a PERFECT.
- Languages who use a PERFECT to refer to a recent past use an additional time adverbial: *just, gerade, kortgeleden*.
- Tentative conclusion: RECENT PAST can be a dimension of the PAST or of the PERFECT, but in both cases recency requires additional marking.

Dutch

ep-00-12-11.xml - 3661

Het Hof van Justitie heeft kortgeleden de richtlijn van 1998 betreffende het verbod op reclame en sponsoring in de tabakssector geannuleerd .

Translations

German

Perfekt

Der Gerichtshof hat nämlich gerade die Richtlinie aus dem Jahr 1998 , die Werbung und Sponsoring für Tabakerzeugnisse verbietet , aufgehoben .

English

present perfect

The fact is that the Court of Justice has just repealed the 1998 Directive banning advertising and sponsorship of tobacco products .

Spanish

pasado reciente

El Tribunal de Justicia , efectivamente , acaba de anular la directiva de 1998 que prohibía la publicidad y el patrocinio de los productos del tabaco .

French

passé récent

La Cour de justice , en effet , vient d' annuler la directive de 1998 interdisant la publicité et le parrainage en faveur des produits du tabac .

Future research

- **Lexical annotation**: Annotate verbs for aspectual class, identify locating time adverbials, identify aspectually sensitive adverbials (*since, for, already, just, always,* negation), and investigate interaction with PAST/PRESENT/PERFECT.
- **Discourse annotation**: Investigate narrative and non-narrative tense use of the PERFECT.
- **Syntactic annotation**: Investigate the interaction of (i) voice (active/passive, see CLIN 2015 presentation) and (ii) clause type (main/subordinate, e.g. conditional) with PAST/PRESENT/PERFECT.

Thanks for your attention!

- Any questions or feedback?
- More on our research programme on our website: http://bit.ly/timeintranslation