# PALMORF's morpholympical headaches

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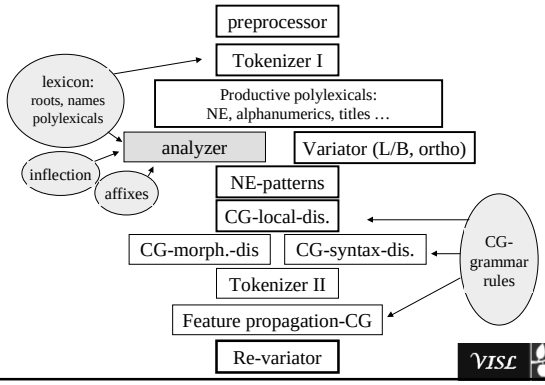
## Distributed morphology




## Program chains used in the Morpholympics

```
Runcorp.analex:
   prp.pre | preprocessor | prp.post | morfanalyse | cg2adapt
   | samtrad | dis --grammar portcg.wordlist | mdis --grammar
   portcg.wordlist | propagation.perl | joinall | cleanup.perl
   | unjoin | samtrad | niceline.perl | uppercase.perl |
   remove_secondary | dianafilter.post
Runwordlist:
   perl -wnpe 's/$/\n/' | prp.pre | preprocessor | perl -wnpe
   's/^((da|do)s*)-$/$1A-/' | morfanalyse | cg2adapt | samtrad
   | dis --grammar portcg.wordlist | mdis --grammar
   portcg.wordlist | propagation.perl | cleanup.perl | samtrad
   | niceline.perl | uppercase.perl | remove_secondary |
   dianafilter.post | perl -wnpe 's/^\$¶ *\n//g'
```

## Some problems in retrofixing an integrated tagger-disambiguator for multi-tagging

- Palmorf does some tokenization only after disambiguation:
  *deste, o que, nos, consigo, hyphenates, some name chains*
- Most adjectives with potential nominal function are not tagged as nouns by the analyser, but identified as np-heads by the syntactic grammer, and - if wanted - later marked with a secondary noun tag
- The analyzer itself uses some port-manteau tags *(-amos PR/PS -ista MF)* instead of 2 separate tag lines. The ambiguity is resolved after syntax by dependency propagation.
- Palmorf expects running text input, and its pattern matching filters can get confused by spaces before punctuation, non-standard quotes, non adjacent apostrophes etc.
- In a tagger-disambiguator, derivation overgeneration across word classes is no problem, since it can be contextually resolved, so the analyzer as such is not optimized for precision in this field

## Why polylexicals (MWE) ?

- Recognizing polylexical **"adverbs", "prepositions" etc.** *(locuões)* is essential for context based disambiguation and syntax, since it makes context patterns less complex
- Recognizing polylexical **"nouns" and verb incorporation** *(cobra cascavel, estar com fome)* helps semantic disambiguation and MT.
  (Verb incorporation is currently inactivated in PALAVRAS)
- Recognizing **name chains**, and treating them as units,
  a) creates **simpler context** for disambiguation of other words/functions
  b) allows **NE-subtyping**, e.g. <hum> recognition by Christian name first part
  c) prevents **lower case name parts** *(de, von)* from receiving other word classes
  d) allows a meaningful analysis of **name-integrated numbers and punctuation** *(car names, &, /, D. Fernando II, Nimbus 2000)*
  e) avoids **unnecessary ambiguity** in uppercase words also lexicalized as non-names

## Local disambiguation 1

**Local word class disambiguation in hyphenates**

```
MAP (§ADJ) TARGET (<top> PROP) (-1 <hyfen> LINK 0 (<top> PROP)) ; # EUA-África
MAP (§ADJ) TARGET (<top> PROP) (0 <hyfen>) (1 (<top> PROP)) ; # EUA-África
SELECT (PERS) (-1 <hyfen> + V) ;
REMOVE (N) (0 ("político" ADJ) LINK 0 <hyfen>) (1C ADJ) ; # político-social
SELECT (PRP) (0 <hyfen>) (-1 <hyfen>) ;
REMOVE NON-N-WORD (-1 <hyfen>) (NOT 0 <hyfen>) (-1C (PR 3S)) ; # guarda-avança
REMOVE NON-V-WORD (0 <hyfen>) (1 PERS) ;
REMOVE NON-N-WORD (0 <hyfen> LINK 0 N-DYR OR N-HUM) ; # cobra-coral
```

**Local word class disambiguation otherwise**

```
REMOVE (PROP) (0 <art> OR PRP OR KS OR NUM OR <rel> OR <interr> OR <atemp>) ;
REMOVE (<foc> ADV) (0 ("ser")) (NOT 0 (3S IND)) ;
```

**Local case disambiguation on clitics**

```
MAP (§DAT) TARGET (<hyfen> PERS ACC/DAT) (1 PERS) ; deu-mos
MAP (§DAT) TARGET (PERS ACC/DAT) (-1 <hyfen> LINK 0 <vd>) ; # ajudou-me
MAP (§ACC) TARGET (PERS ACC/DAT) (NOT 0 <hyfen>) (-1 <hyfen>) (NOT -1 <vd> OR <vdt&>) ; # convidou-
    me
MAP (§ACC) TARGET (PERS ACC/DAT) (-1 <hyfen>) (NOT 1 PERS) (NOT -1 <vd> OR <vdt&>) ; # lavar-se-iam
```

## Local disambiguation 2

**Local gender/number disambiguation in hyphenates**
MAP (§M) TARGET (<hyfen> M/F) (1C (ADJ M) OR (PCP M)) ; # comunista-adjunto, azul-claro
MAP (§S) TARGET (<hyfen> S/P) (1C (ADJ M) OR (PCP S)) ;
MAP (§M) TARGET (M/F) (-1C (N M) OR (ADJ M) OR (PCP M) LINK 0 <hyfen>) ;
MAP (§S) TARGET (S/P) (-1C (N S) OR (ADJ S) OR (PCP S) LINK 0 <hyfen>) ;
**Local mode disambiguation in hyphenates**
REMOVE (IMP 2S) (0 <hyfen>) (1 PERS) (NOT 1 (2S ACC)) ; # incorpora-se, ikke: lava-te

**Overgenerating affixation**
REMOVE (<DERS <DERS) (0 PROP) ; REMOVE (<DERP <DERP) (0 PROP) ;
REMOVE (<DERS -az [AU]> <DERS -ão [AU]>) ; # no double augmentatives
REMOVE (<DERS -aço [AU/PEJ]> <DERS -ão [AU]>) ; # no double augmentatives in comptetion with -ação/-ações
REMOVE (-ico [DIM]> N) OR (-im [DIM]> N) OR (-ela [DIM]> N) ; # these diminuitives are not productive for N
REMOVE (-ito [DIM]> ADJ) ; # these diminuitives are not productive for ADJ
REMOVE (<DERS <DERS -ia [ABSTR]) ; # '-ia' not after other suffixes
REMOVE (<DERS <DERS -or [ABSTR]) ; # '-or' not after other suffixes

**Local disambiguation after NE-type-recognition**
REMOVE (<DERS) OR (<DERP) (0 (<exheur>)) ; # after name recognition in samtrad
REMOVE (<foreign> PR 1/3S) ; REMOVE (<HEUR> PROP) (0 (<top> PROP) OR (<H> PROP)) ;
**Prepare for re-tokenizer (doesn't fuse if ambiguous)**
SELECT (PROP) (-1 PROP) ; # SOS Ásia

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## Hopes for the future

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- Evaluation of **disambiguated** PoS/morphology, ***in context*** and on ***running text.***
- Evaluation of **syntactic** tagging in conjunction with PoS/morphology (would solve ADJ/N, ADV/CONJ, focus particle, and a number of other problems in inter-system comparison
  - though probably creating a load of new ones ….

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