Towards an XFST and XLE Grammar Implementation of Lithuanian

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Goals
- No Lithuanian morphology or syntactic parser existent → First-time creation
- Realization of a Finite State Morphology using the Lexc-formalism and the Xerox XFST Compiler
- Definition of a LFG-based grammar for the Xerox Linguistic Environment (XLE)

Lithuanian
- 3.2 million speakers
- Indo-European language: one of the last two Baltic languages
- 32 characters (Latin alphabet plus diacritics)
- Inflecting language
- Morpho-syntactic properties:
  - 7 cases (Nominative, Genitive, Dative, Accusative, Instrumental, Locative, Vocative),
  - 3 genders (Masculine, Feminine, Neuter),
  - 2 numbers (Singular, Plural) (partially Dual)

Morphology in Lexc → XFST Compiler
(Beesley and Karttunen 2003)

About 5000 morphemes
- Content words: Nouns, verbs, adjectives, adverbs
- Function words: Pronouns, auxiliaries, prepositions demonstratives, quantifiers, numerals
- Proper first and last names
- Inflectional paradigms and derivational rules
- Verb-valencies and subcategorisation frames.
- Extension via semantic features of stems possible

Resulting Finite State Transducer
Number states: 3656
Number of transitions: 7549
Example output:

Evaluation of Morphology
- Reading and tokenizing online newspapers using a python script
- Automatic entering of tokens in Finite State Morphology
  → Extensive recognition of listed words in all inflectional forms
  → However, only fractional amount of all words listed at the moment

Grammar and Parser
Lexical Functional Grammar (LFG) (Bresnan 2001)
Xerox Linguistic Environment (XLE) (Butt et al. 1999)

Number of rules: 9
- Declarative clauses
- Transpositions possible

Example:
*mama supa dabar ramius vaikus*
'Mom cradles the now calm children,'

C-Structure:
(F-Structure:)

Future Work
- Adding words into morphology
- Building generic roots → Universal morphological rules
- Expanding grammatic rules

More on the project: http://ltl.emich.edu/lithuanian/

Literature