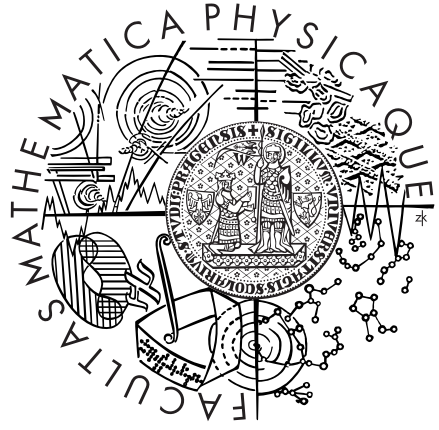
MorphoDiTa and NameTag

Current State and Future Plans

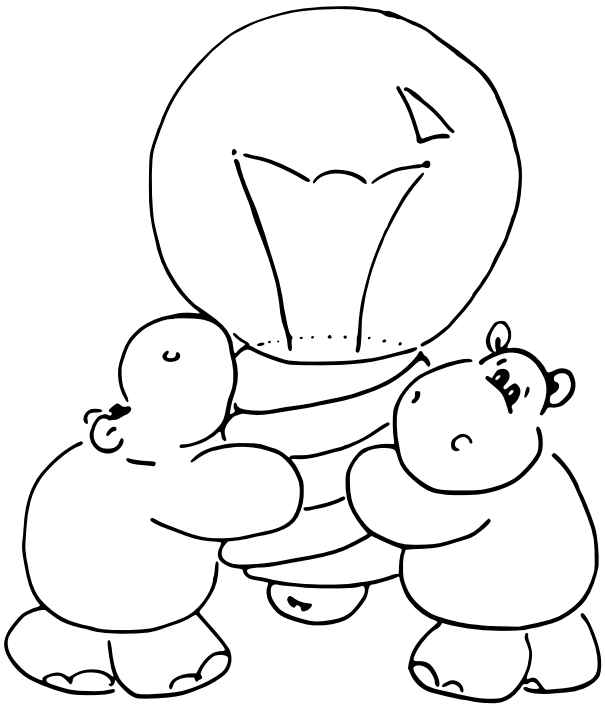
Milan Straka



ÚFAL Seminar Sedlec-Prčice

15^{th} September 2014

Questions



Please do not hesitate to ask questions.

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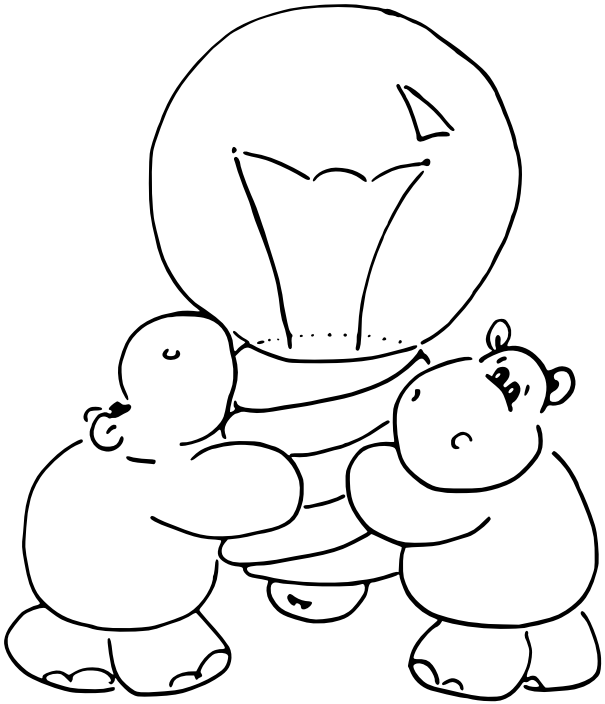

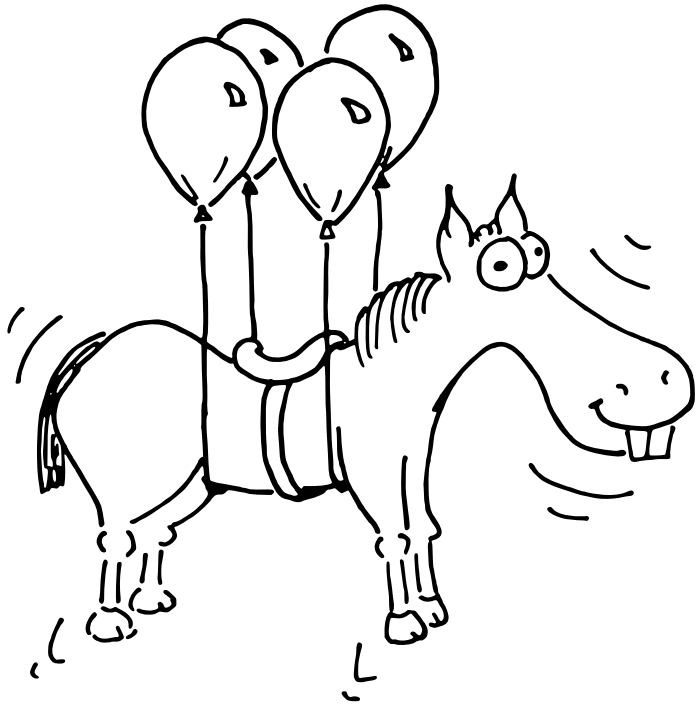

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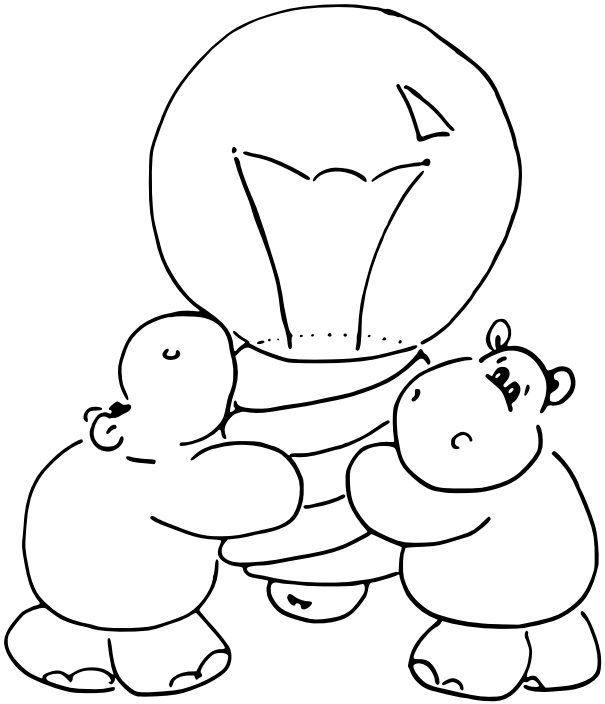

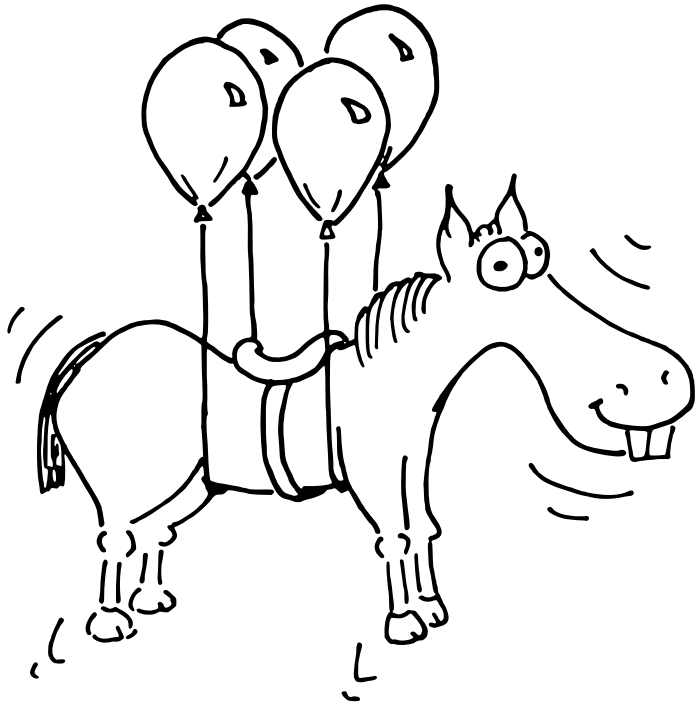

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MorphoDiTa

- **Morpho**logical **Di**ctionary and **Ta**gger
- implementation of morphological dictionary and POS tagger, performing morphological analysis, morphological generation, POS+lemma tagging and UTF-8 tokenization

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MorphoDiTa Goals

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- to have a system
  - providing Czech morphology and POS tagging
  - with clear licences
  - usable in multiple programming languages
  - reasonably efficient in terms of speed, memory complexity and model sizes
- originally, the plan was to use existing systems
  - failed because of several reasons (unmaintained code, lack of features, inefficiency, etc.)
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  - support morphology of as many languages as possible

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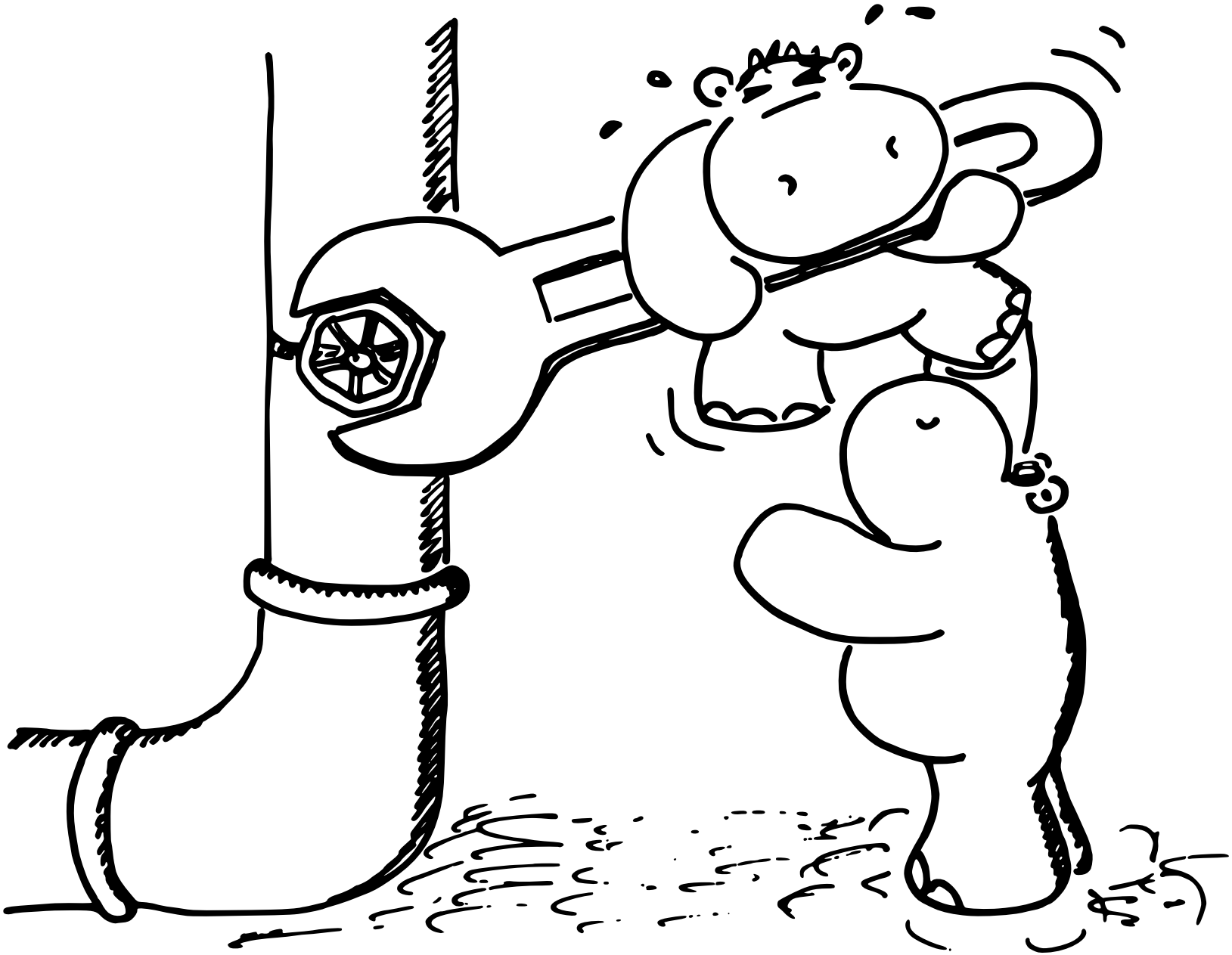

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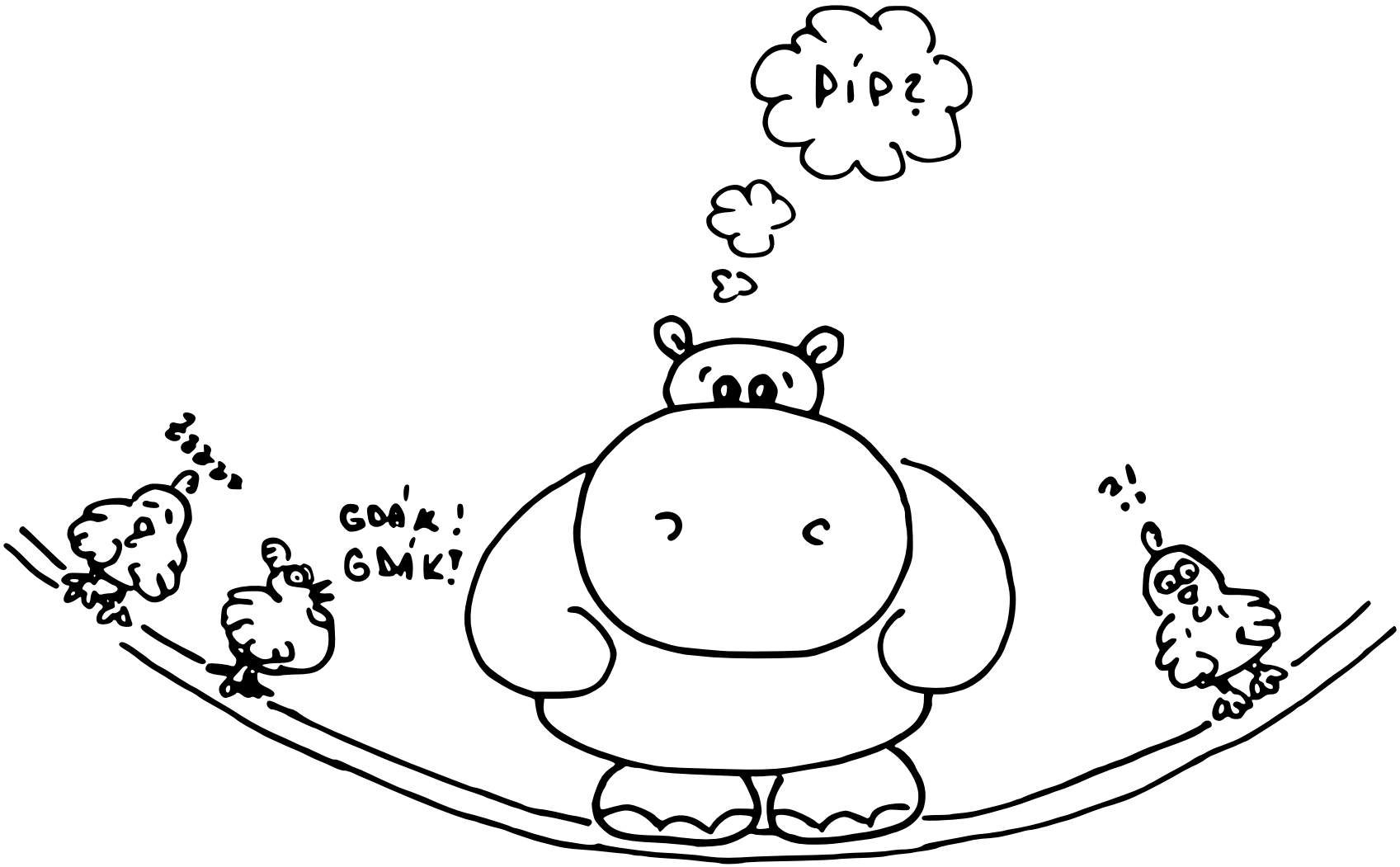

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Morphological Dictionary

- use flat *form* - *lemma* - *tag* triplets on input
- create a binary representation that allows fast analysis and generation and is reasonably compact (should gracefully handle a gigaword)
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- reimplementation of Morče and Featurama
  - averaged perceptron algorithm with Viterbi decoding
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- Czech Morfflex contains 120M form-tag, 1M unique lemmas, 3992 tags; total size 6.7GB
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Morphological Analysis Guesser

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- that would allow to create POS taggers using disambiguated data only, even for languages with rich morphology
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- an extension to morphological analysis guesser
- create flat *form - lemma - tag* morphological dictionary using disambiguated data only
- can be used for both morphological analysis and morphological generation
- still a research area (ideas welcome)

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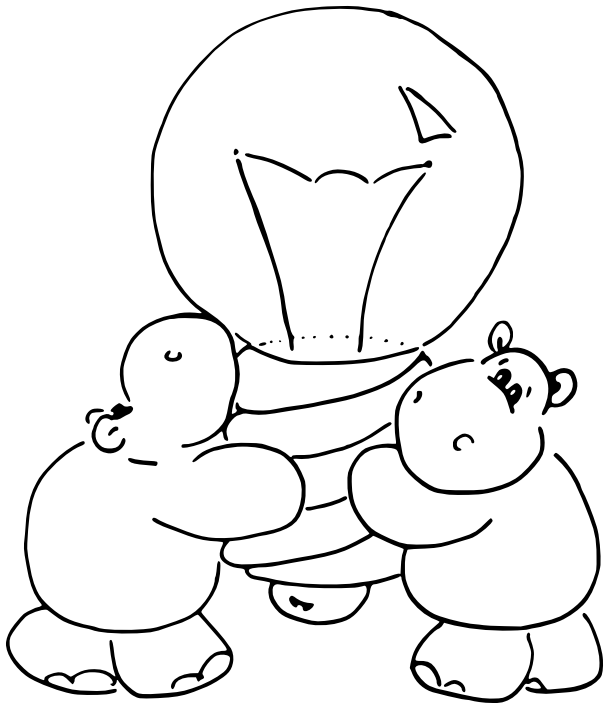

Is there anything you would like in MorphoDiTa?

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- **Name**d entity **tag**ger
- named entity recognizer build upon MorphoDiTa

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- identifies and classified named entities
- both machine learning model and manual rules can be used at any point in the pipeline
- supervised machine learning model
  - neural network classifier produces BILOU class+named entity type for every word
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- trained on Czech Named Entity Corpus
  - embedded name entities
  - two-level name entities hierarchy
    - 7 coarse classes, 46 fine-grained classes
  - $\approx$ 35k named entities
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  - CNEC does contain embedded named entities, but NameTag tries to predict the outer ones (apart from the so-called *containers*)

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- make use of available large corpora
  - currently, only Brown clusters benefit from them

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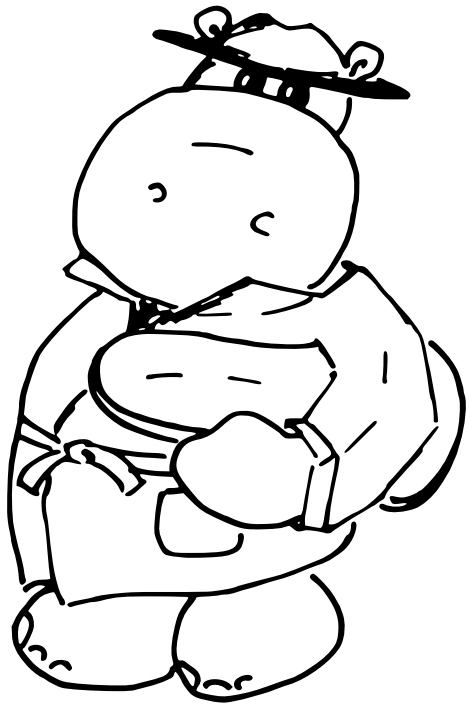

Questions?