Word-Level QuEst++ Manual

By Gustavo Henrique Paetzold

1. Installation

1) Place all QuEst++ files into a folder of your choice.
2) Download version 3.5.1 of Stanford Core NLP from http://nlp.stanford.edu/software/corenlp.shtml
3) Add the file "stanford-corenlp-3.5.1-models.jar" to "quest/lib"
4) For spanish tagging/parsing models, download the file http://nlp.stanford.edu/software/stanford-spanish-corenlp-2015-01-08-models.jar and place it in "quest/lib"
5) For chinese tagging/parsing models, download the file http://nlp.stanford.edu/software/stanford-chinese-corenlp-2015-01-30-models.jar and place it in "quest/lib"
6) Download the Universal Wordnet plugin from http://resources.mpi-inf.mpg.de/yago-naga/uwn/uwn.zip and unzip it into a folder of your choice.

Important:

- The Universal Wordnet plugin folder is the one which should be referenced in the variable "tools.universalwordnet.path" in the config file.
- The tagging/parsing models for english, spanish and chinese are automatically recognized by QuEst++ if the aforementioned libraries are placed in the "quest/lib" folder.

1. Running

1) Create a configuration file following the example in "quest/config/config.word-level.properties".
2) Create a feature configuration file following the example in "quest/config/features/features_word-level_all.xml".
3) Prepare the source and target language input files for which you desire to estimate feature values. Both files must be tokenized and must have the same number of lines.

4) If you wish to use features that require for alignments between source and target sentences, produce an alignments file. It must be in PHARAOH format, and can be produced by fast_align (https://github.com/clab/fast_align). It can contain 1 to many alignments (1 source word to N target words), but not many to 1 alignments (1 target word to N source words).
5) Run the following command line:

```
java -cp QuEst++.jar:lib/* shef.mt.WordLevelFeatureExtractor -lang
<source_language> <target_language> -input <source_file> <target_file> -mode
<selected_model> -config <config_file> -alignments <alignments_file>
```

6) The output will be saved in the output folder specified in the configuration file under the name "output.txt". It will have M lines, one for each word in each sentence of the target language input file. Each line will have N feature values separated by a tab. It will be in the following format:

```
<word_1_feature_value_1>\t<word_1_feature_value_2>...
<word_1_feature_value_n-1>\t<word_1_feature_value_n>

<word_2_feature_value_1>\t<word_2_feature_value_2>...
<word_2_feature_value_n-1>\t<word_2_feature_value_n>

...

<word_m-1_feature_value_1>\t<word_m-1_feature_value_2>... <word_m-
1_feature_value_n-1>\t<word_m-1_feature_value_n>

<word_m_feature_value_1>\t<word_m_feature_value_2>...
word_m_feature_value_n-1>\t<word_m_feature_value_n>
```

2. Creating a Configuration File

1) Create a plain text file in the folder of your choice
2) Assign values to parameters in the following format, one per line:

```
<parameter> = <value>
```

2.1. Parameter Descriptions

- **features.default:** Standard mode to be used (a mode is defined by a specific selection of features).
- **sourceLang.default:** Source language (english, spanish, chinese, german).
- **targetLang.default:** Target language (english, spanish, chinese, german).
- **output:** Folder in which to save the file with feature values.
- **input:** Folder from which to read input files.
- **resourcesPath:** Path to the folder in which linguistic resources are stored.
- **featureConfig.<identifier>:** Path to a feature configuration file to be used in mode "<identifier>". The user can define many distinct modes, which can be selected in the command line while running QuEst++ through the "-mode" parameter.
- **<source_language>.corpus:** Path to a corpus for <source_language>.
- **<source_language>.poscorpus:** Path to a corpus composed entirely of POS tags for <source_language>.
- **<source_language>.POSModel:** Path to a POS tagging model for <source_language> (it can be either an absolute path to a model trained with Stanford Core NLP, or a classpath from a library in "quest/lib").
- **<source_language>.parseModel:** Path to a parsing model for <source_language> (it can be either an absolute path to a model trained with Stanford Core NLP, or a classpath from a library in "quest/lib")
- **<source_language>.ngram:** Path to an ngram counts file for <source_language>. To produce it manually, call SRILM's "ngram-count" binary with the "-write" option, and pass the resulting file to QuEst's the shef.mt.util.NGramSorter application through the following command line:

```
java -cp QuEst++.jar:lib/* shef.mt.util.NGramSorter <srilm_ngram_file> 4
<ngram_file_order> <frequency_cutoff> <output>
```

If left blank, QuEst++ will try to call your SRILM installation to automatically generate the file and place it into:

<resourcesPath>/<source_language>/<source_language>_ngram.ngram.clean

- **<source_language>.posngram:** Path to an POS tag ngram counts file for <source_language>.To produce it manually, call SRILM's "ngram-count" binary with the "-write" option, and pass the resulting file to QuEst's the shef.mt.util.NGramSorter application through the following command line:

```
java -cp QuEst++.jar:lib/* shef.mt.util.NGramSorter <srilm_posngram_file> 4
<ngram_file_order> <frequency_cutoff> <output>
```

If left blank, QuEst++ will try to call your SRILM installation to automatically generate the file and place it into:

<resourcesPath>/<source_language>/<source_language>_posngram.posngram.clean

- **<source_language>.stopwords:** Path to a file of stop words for <source_language>.
- **<source_language>.translationProbs:** Translation probabilities between words in source and target languages. The file must be produced by fast_align through the following command:

fast_align -i <parallel_data> -v -d -o -c <translation_probabilities>

- **<target_language>.corpus:** Path to a corpus for <source_language>
- **<target_language>.poscorpus:** Path to a corpus composed entirely of POS tags for <target_language>.
- **<target_language>.POSModel:** Path to a POS tagging model for <source_language> (it can be either an absolute path to a model trained with Stanford Core NLP, or a classpath from a library in "quest/lib")
- **<target_language>.parseModel:** Path to a parsing model for <source_language> (it can be either an absolute path to a model trained with Stanford Core NLP, or a classpath from a library in "quest/lib")
- **<target_language>.ngram:** Path to an ngram counts file for <target_language>.To produce it manually, call SRILM's "ngram-count" binary with the "-write" option, and pass the resulting file to QuEst's the shef.mt.util.NGramSorter application through the following command line:

java -cp QuEst++.jar:lib/* shef.mt.util.NGramSorter <srilm_ngram_file> 4 <ngram_file_order> <frequency_cutoff> <output>

If left blank, QuEst++ will try to call your SRILM installation to automatically generate the file and place it into:

<resourcesPath>/<target_language>/<target_language>_ngram.ngram.clean

- **<target_language>.posngram:** Path to an POS tag ngram counts file for <source_language>.To produce it manually, call SRILM's "ngram-count" binary with the "-write" option, and pass the resulting file to QuEst's the shef.mt.util.NGramSorter application through the following command line:

java -cp QuEst++.jar:lib/* shef.mt.util.NGramSorter <srilm_posngram_file> 4 <ngram_file_order> <frequency_cutoff> <output>

If left blank, QuEst++ will try to call your SRILM installation to automatically generate the file and place it into:

<resourcesPath>/<source_language>/<target_language>_posngram.posngram.clean

- **<target_language>.stopwords:** Path to a file of stop words for <target_language>.
- **<target_language>.refTranslations:** Path to a file containing reference translations in the target language. The file must have the same number of lines as the target input file, and must contain one reference translation per line.
- **tools.ngram.path:** Path to the binaries folder of your SRILM installation (tipically "srilm/bin/<operational_system>"). This parameter is only required if you wish for QuEst++ to automatically produce missing the “source.ngram” and “target.ngram” files.
- **tools.universalwordnet.path:** Path to the Universal Wordnet plugin folder (must contain files "uwn.plg" and "uwn.dat").

  ngramsize: Ngram size ngram count files in case you want QuEst++ to produce them for you. We recommend a minimum of 4-gram ngram files and language models.

  Important:

- If you provide a valid path in "tools.ngram.path", QuEst++ can reliably produce <source_language>.lm, <source_language>.ngram, <target_language>.lm and <target_language>.ngram automatically.
- We recommend for you to create separate configuration files for Word/Sentence/Document-Level QuEst++.