Customizing Quails

This page contains two brief tutorials:

- 1. Understanding quails.py.
- 2. How to add NLP services to the Quails server.

Understanding quails.py

Quails Constants

Quails constants contain hardcoded paths and other static items that are depended on by the interface and the server.

```
# constants
CONFIG_FILE = "config/quails.config"
SERVER = "http://localhost:5000/quails"
DELIMITER = "+"
TRAINING_FILE = "training_questions/train_1000.label"
```

NLP Data Structures

In the configuration file <code>config.py</code>, the order of the NLP steps determines their order in the NLP pipeline (see Ask a Question). The structure <code>valid_pipelines</code> represents the list of valid NLP pipelines. The server checks against this list when an NLP request comes in. If the incoming pipeline is valid, the request is processed. Otherwise, the server returns a failure message. If you add a new function to <code>nltkfuns.py</code> or <code>stanfuns.py</code>, you will need to create new pipeline objects that include your new service. This will be demonstrated in the second tutorial on this page. Be careful to consider what type of input your function needs. For example, in the second tutorial we will add a function to the server that extracts noun phrases from parse trees. If we have not already generated a parse tree, then the noun phrases function will fail.

The step_input structure specifies the input type required by each of the available steps. This is where we specify that the function nounphrases requires input type parsetree. Naming the input type after the function that generates it is an easy way to manage the dependencies. Moreover, it is required in order for the server to feed the correct input to the current NLP step. This is because when a step is run, say pos, the results are stored in a dictionary entry called pos. Therefore, when we wish to use the named entity recognizer, ner, we can feed it the result of the pos function. This can be expressed as the following:

```
# the server calls the function in a different manner...
# this is some funky pseudocode to get the point across

question.nlp_features['ner'] = ner(question.nlp_features['pos'])
```

Classification Data Structure

Quails attempts to predict the answer type of the input question. For example, if the question is "How fast is the fastest car?", Quails determines that the answer required is a number, more specifically a speed. See this page for more information on the Li taxonomy of classification.

The Li classes are encoded in the classes dictionary, where the coarse grained class is the key, and the values are each of the fine grained classes that fall under the key.

Quails Objects

Quails objects are special objects used primarily by the pipeline interface. run.py. To view the definitions of the objects, please look in quails.py.

Question

The Question class is a representation of the question. The class is defined in quails.py and contains a number of question-specific data structures and methods. The data structures hold information about the question, gathered during the question analysis phase, as well as candidate answers and their scores.

QuailsConfig

The QuailsConfig class configures the question answering pipeline by reading the user's prefences from config(configquails. It inherits methods from the python module configparser.

How to add NLP Services to the Quails Server

In this tutorial, we will walk through the process of adding an NLTK function called nounphrases to the server. The nounphrases function will extract a list of noun phrases from the questions parse tree.

This tutorial assumes that you have read the first tutorial and will not re-explain the reasons for adding reference to the valid_pipelines and step_input structures.

1. Add the function to nltkfuns.py.

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First, add the function to the list of functions at the top of the file.

Second, add the name of the function to the nltkfuns list. This list allows the server to build a list of callable functions, or NLP pipeline, based on the user's preferences.

2. Add the function name to the list of valid pipelines in quails.py.

3. Add the input type to quails.py.

Currently, there is no way to streamline this process, but using this guide should make it fairly simple to introduce new NLP functionality to the system.

Future versions will enable the user to add functionality to more components of the Quails system.