English to Olog Translation
or: how I learned to stop worrying and love the Olog.

An Olog is a great and powerful tool.

A proof of concept by a M.I.T. Student
2.3.2.4  Reading aspects and paths as English phrases

Each arrow (aspect) $X \xrightarrow{f} Y$ can be read by first reading the label on its source box (domain of definition) $X$, then the label on the arrow $f$, and finally the label on its target box (set of values) $Y$. For example, the arrow

$$\begin{array}{c}
\text{a book} \\ \text{has as first author}
\end{array} \xrightarrow{\text{has as first author}} \begin{array}{c}
\text{a person}
\end{array}$$

(2.15)

is read “a book has as first author a person”.

Rules of good practice 2.3.2.8. An aspect is presented as a labeled arrow, pointing from a source box to a target box. The arrow text should

(i) begin with a verb;

(ii) yield an English sentence, when the source-box text followed by the arrow text followed by the target-box text is read; and

(iii) refer to a functional relationship: each instance of the source type should give rise to a specific instance of the target type.
Inspiration continued

- If aspects can be read as English sentences... can English sentences be turned into aspects?

- Could we take a list of aspects written in English, and back out the Olog?
  - Perhaps even more inferences could be made

- **DISCLAIMER** – Because English is not always functional... we will not always get true Ologs out of our sentences...

- Monads are the solution
Instead of $X \to Y$

- Where the arrows in the Olog represent functions

We can use $X \to \mathcal{P}Y$

- Where the arrows in this context represent relations
- The powerset of $Y$ contains all possible subsets of $Y$, and so any relation from $X$ to $Y$ is kosher.

This allows arrows in the Olog to represent relations instead of functions.
Mission Statement and Approach

Mission Statement
- Create a proof of concept that can take a list of English sentences, pull out some relationships, and display them as an Olog.
- People speak English... why can’t we translate for them?

Decompose the problem
- Convert English sentences to parts of speech
- Given parts of speech, find boxes and arrows
- Given boxes and arrows, display the resulting Olog automatically
Searched for a tool for drawing graphs

- Found a program called Graphviz
  - “Graph Visualization Software” developed by AT&T
  - Uses DOT language scripts.
  - It’s free

- The kicker... it has a Python wrapper called PyGraphviz!
  - `A.add_edge(1,2)`
Searched for a tool for identifying parts of speech (POS) in a sentence

Found a python module called topia.termextract

This module can tokenize a sentence...

```python
>>> tagger.tokenize('This is a simple example.

This', 'is', 'a', 'simple', 'example', '.
```

And then determine the parts of speech

```python
>>> tagger('This is a simple example.

This', 'DT', 'This'

is', 'VBZ', 'is'

a', 'DT', 'a'

simple', 'JJ', 'simple'

example', 'NN', 'example'

.', '', '.
```
Given POS, find boxes and arrows

- With PyGraphviz and topia.termextract both available for free, coding the POS -> (boxes and arrows) portion in Python made the most sense.

- After looking at a few Ologs, a method for doing this was determined (assuming a NF, VF, NF structure):
  1. First NF starts at the beginning and goes until the first verb.
  2. VF starts at the verb and goes until the first “a” or “an”.
  3. And the second NF goes from the “a” or “an” to the end.
A simple example

- Book author
- A book has as first author a person.
More features

- Recursively tear down adjective phrases
- Deal with prepositional phrases
- Remove adverbs from verb phrases
- Check box for verbose output
- Open Source
- Decided to avoid pull outs for now
  - Blows up quickly
A jolly rabbit is a happy animal.

Verbosity:

Standard Output:

A jolly rabbit is a happy animal.

Verbose Output:

A jolly rabbit is a happy animal.
More Adjective Phrases

What happens if we add more adjectives?

A jolly and silly rabbit is a happy animal.
What happens if we add even more adjectives?

A jolly bouncy silly rabbit is a happy animal.

Adjective phrases
Even More Adjective Phrases

What happens if we add even more adjectives?

Adjective phrases

A jolly bouncy silly and hungry rabbit is a happy and troublesome animal.
A rabbit steals cereal from a kid.
A trick is for a kid.
Prepositional phrases

A man with a broom is a person.

Prepositional phrases

A man with a broom is a person.
More Prepositional Phrases

What happens if we add more sentences?

A man with a broom is a person.
A wizard with transportation is a man with a broom.
What happens if we add even more sentences?

Prepositional phrases

A man with a broom is a person.
A wizard with transportation is a man with a broom.
A wizard is a man with magical abilities.
We can remove adverbs from verb phrases...

A man always has a biological mother.

Remove adverbs

a man

has

a biological mother

is

a mother
This is a test

A force equals a mass times an acceleration.
A mildly overweight man is a man.
A child has a mother.
A mother has a mother.
A father has a mother.
More examples

Adjective phrases

A jolly bouncy crazy silly and hungry rabbit is a happy annoying and troublesome animal.
A rabbit steals cereal from a kid.
A trick is for a kid.
A vision for the future

Additional Features
- Web/graphical interface
- Like Google translate
- Noun phrase parsing
- Olog to English output
- FQL output
- Proper nouns to data

Future applications
- Olog wikipedia and the dictionary
- Scientific paper Ologging

An Olog nation is a vision for the future.
An inquisitive and thoughtful audience asks questions after an exciting presentation.

A math class at MIT is a thoughtful audience.

http://sourceforge.net/projects/olognation/files/English2Olog.py/download