

AceWiki: Controlled English in a Semantic Wiki

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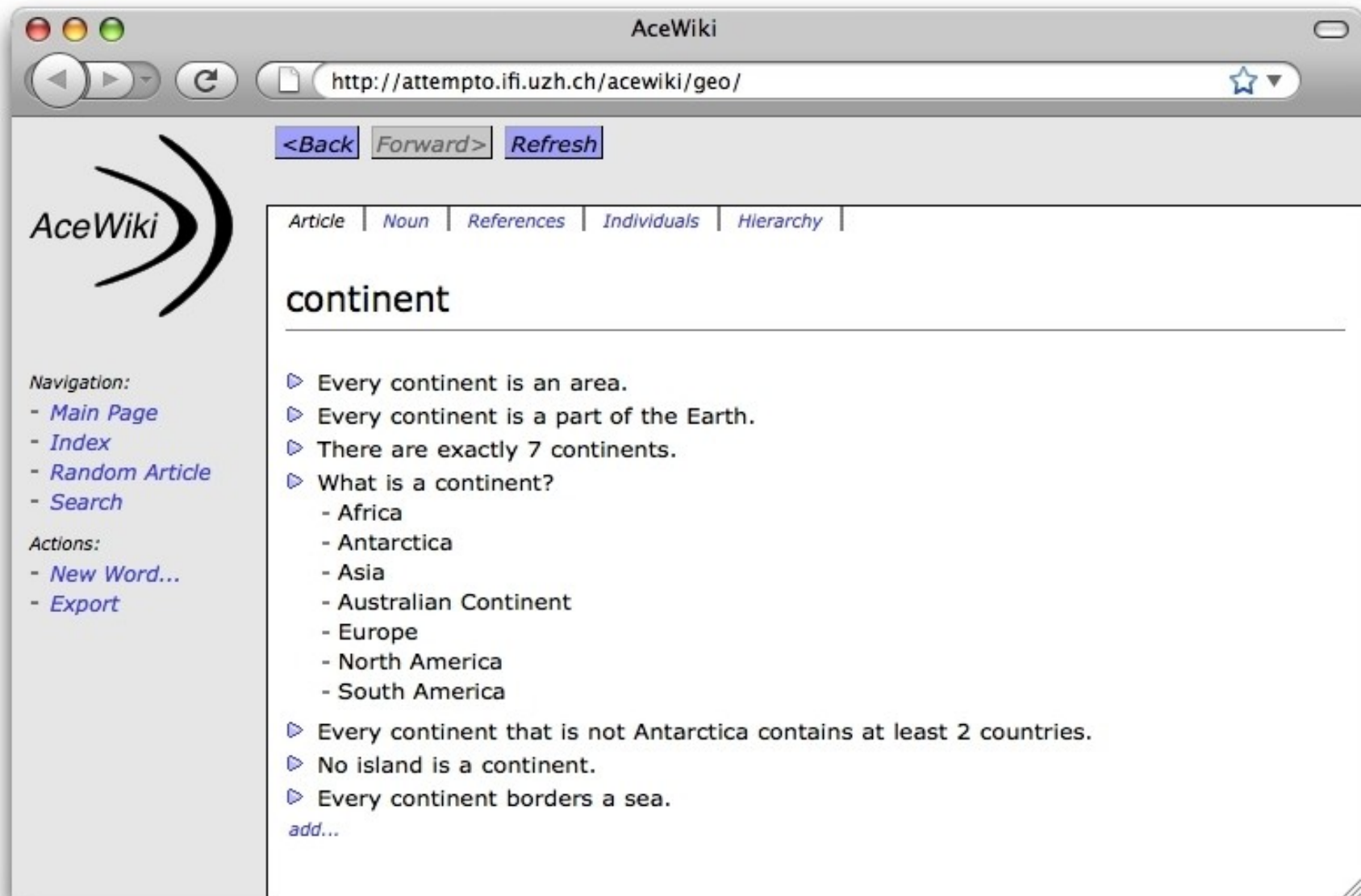
AceWiki

- AceWiki is a new kind of semantic wiki
- Goals:
 - **Good usability** (even for completely untrained people)
 - **High expressivity** (OWL and beyond)
- Approach:
 - Articles are written in **controlled English**

Attempto Controlled English (ACE)

- Attempto Controlled English (ACE) is a **controlled natural language**, concretely a subset of English
- Can be translated **automatically and unambiguously** into various logical notations, e.g. first-order logic, OWL, SWRL
- Supports a relatively large subset of natural English:
 - Proper names, nouns, verbs, adjectives, singular/plural, relative phrases, anaphoric references, existential and universal quantifiers, negation, conditional sentences, question, and much more...

AceWiki: Screenshot



AceWiki: Words

- Proper names stand for **individuals**, e.g. Switzerland, Bob Dylan
- Nouns stand for **classes**, e.g. country, person
- Transitive verbs, of-constructs, and transitive adjectives stand for **binary relations**, e.g. owns, contains, part of, friend of, located in, used for



AceWiki: Reasoning

- ACE is more expressive than OWL
- Since AceWiki currently uses an OWL reasoner, not all ACE statement can be used for the reasoning:
 - ▶ No country borders every country.
 - ▶ If Liechtenstein is a country then Andorra is a country.
 - ▶ If a country contains an area and does not control the area then the country is an unstable-country.
- The reasoner is used for consistency checking, individual classification, class hierarchy extraction, and query answering

AceWiki: Consistency Check

- Each time a new sentence is added, AceWiki checks whether it contradicts the current ontology
 - ▶ Every country is a part of exactly 1 continent.
 - ▶ Every country that borders Switzerland is a part of Europe.
 - ▶ Germany borders Switzerland.
 - ▶ **Germany is a part of Asia.**
- If there is a contradiction then the sentence is displayed in red font and not added to the ontology (i.e. not used for reasoning)
- No reasoning without consistency!

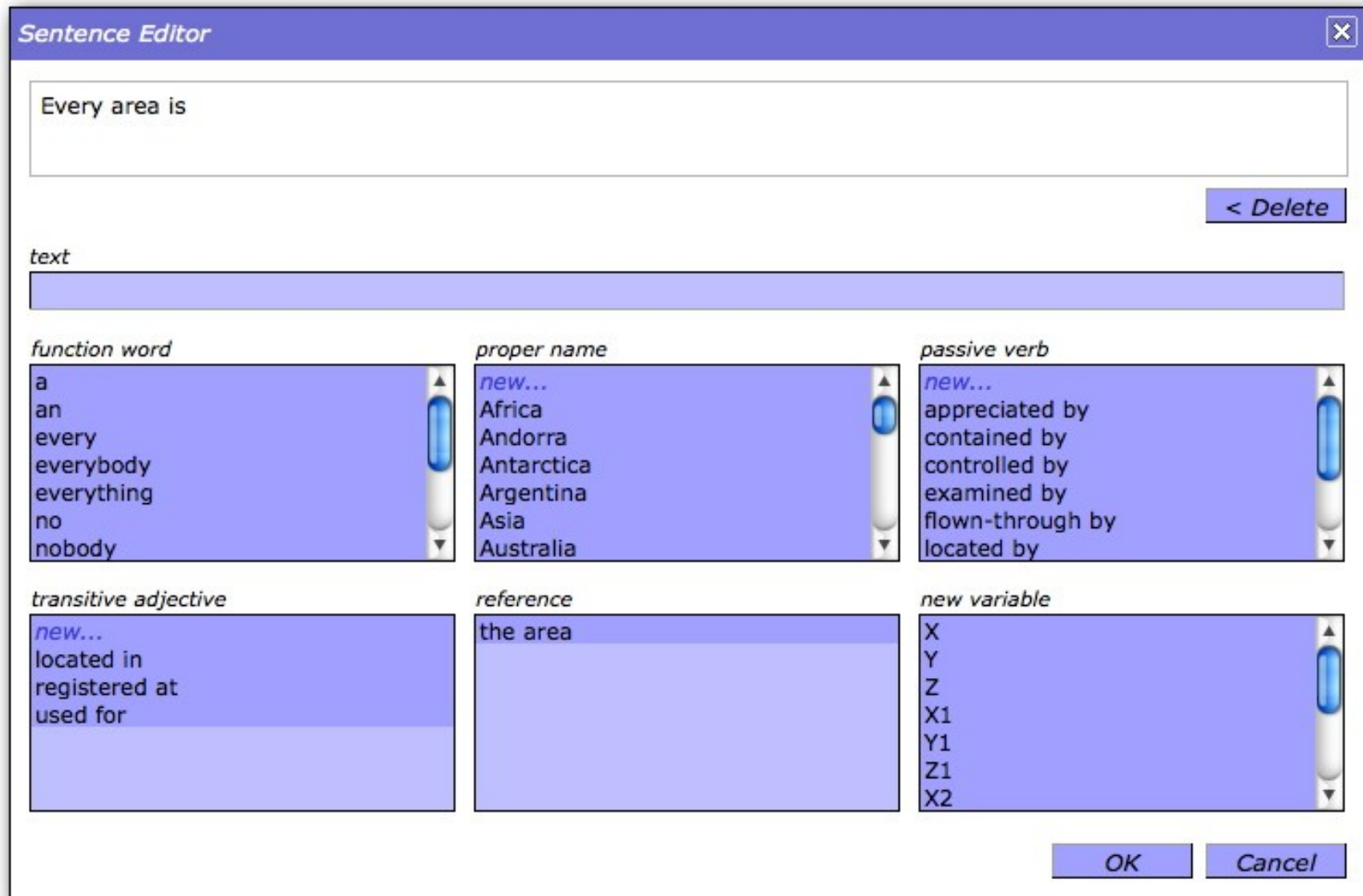
Queries in AceWiki

- In AceWiki, articles can contain **inline queries** expressed as ACE questions
- Some examples:
 - ▶ Which continents contain more than 10 countries?
 - ▶ Zurich is a part of what?
 - ▶ Switzerland borders which country that borders Spain?
 - ▶ Which rivers flow through a country that borders Germany?
- Such questions are answered automatically by the reasoner:
 - ▶ Which cities are located in Switzerland?
 - Berne
 - Geneva
 - Lucerne
 - Zurich

AceWiki: Predictive Editor

- ACE sentences are easy to understand, but writing statements in ACE is more complicated because the language restrictions have to be considered
- AceWiki provides a **predictive editor** that helps the users to create syntactically correct sentences
- The predictive editor “**looks ahead**” and shows word-by-word all possible continuations of a partial ACE sentence

AceWiki: Editor



AceWiki: Technical Details

- AceWiki is currently in its **alpha stage**
- The reasoner **Pellet** is used (version 1.5.2)
- The ontology can be **exported** in OWL 2 format
- AceWiki is written in Java using the **Echo Web Framework** making use of modern AJAX technologies
- Some important features are still missing: history/undo facility, user management, ontology import, ...
- AceWiki and the ACE parser are available under the **LGPL** license

AceWiki: Evaluation

- A **usability experiment** has been performed in order to find out how easy or complicated it is to use AceWiki
- The participants were asked to add general and verifiable knowledge to the wiki
- No instructions how to deal with AceWiki
- 80% of the created sentences were **correct and sensible**
- 61% of the correct sentences were **complex** (i.e. contained a negation or an implication)

That's all, folks!

- Thank you for your attention!
- More information can be found on the AceWiki website:
 - <http://attempto.ifi.uzh.ch/acewiki/>