Chimæra

An Environment for Merging and Testing Large Ontologies

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- developed by Knowledge Systems
 Laboratory (KSL) at Stanford University,
 CA, USA
- was built on top of Ontolingua
- runs in web browser, available over the www

What is it about?



merging ontologiesdiagnosing ontologies

loading (and creating) knowledge bases
reorganizing taxonomies
resolving name conflicts
browsing ontologies
editing terms

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In principle?

- Go to <u>URL</u> and login
- Create a new KB by selecting "Ontolingua" from the "Create a new KB of this type" drop down menu

KB Selection Form:		
Create a new KB of this type:		•
Select an existing open KB, or	ATP CLASSIC	om the library:
ATP KBs already open		Li
No open KBs	CML Ontolingua	k
CLASSIC KBs already o		Libra
No open KBs		No openable KBs



- Specify name in the textfield
- Select "Hpkb-Upper-Level-Latest" as parent KB and click on "Do it"

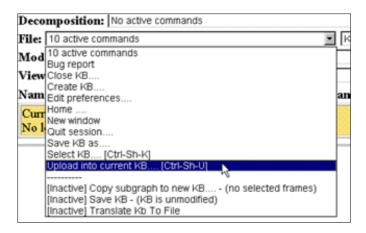
KB Creation Form: Specify name and parents for the new KB:

KB Name:	kb-merge
Do it	Reset
Parents:	Frame-Ontology 3d-Tensor-Quantities Abstract-Algebra Agents Basic-Matrix-Algebra Bibliographic-Data Chemical-Crystals Chemical-Crystals Chemical-Elements Components-With-Constraints Device-Ontology Digital-Designer-Query-Ontology Digital-Designer-Query-Ontology Digital-Designer-Query-Ontology Digital-Designer-Query-Ontology Digital-Designer-Query-Ontology Digital-Designer-Query-Ontology Hp-Product-Ontology Hp-Product-Ontology Hpkb-Upper-Level-Kernel-Latest Hpkb-Upper-Level-Relations-Latest



 Load a KB by selecting "Upload into current KB" from the "File" drop down menu.

 Select KB content to upload by specifying the URL of the KB and selecting the language of the KB (OKBC)



		_		
Select KB content to upload:				
Please select the file to upload and select "Do it" to merge the contents of the file into the current KB.				
Do it Cancel	Reset			
Upload a file:		Browse		
Upload from a URL:	c/TutorialOntologies/saic-products-2.ok	oc		
Load file on server:				
Language:	OKBC Describe languag	je		
Name of source KB:	Will be specified in the file AFFINIA ANSI KIF			
Forms to upload:	CLASSIC CLASSIC CML COOL/CLIPS CYC KIF FORMAT INDENTED INPUT IXOL KIF 3.0 OCELOT OKEC OKEC WITH ANSI KIF ONTOLINGUA PROTEGE	K		



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How does it work...

- Upload another KB
- Stub out missing frames by selecting it from the "Class" menu
 - "Name: [Inactive] Add subclasses (no classes selected) [Inactive] Add suffix - (no class selected) [Inactive] Add superclasses - (no classes selected)

 "Name
 [Inactive] Add superclasses - (no classes selected)

Decon

Mode

View:

Analysis: 17 active commands

tive commands

Create root class - (name required) File: 1 Remove redundant superclasses in whole KB

[Inactive] Add prefix - (no class selected)

Class: 3 active commands

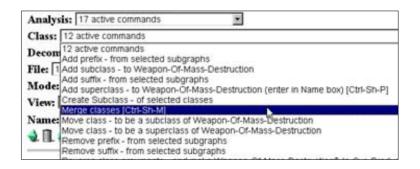
 Change into "Name Resolution" mode by selecting it from the "Mode" menu.

File: 1	3 active commands 📃 KB arg	
Mode:	10 active commands	
Name:	10 active commands Don't assume that input KBs are clean Edit commands cause agenda advance Hide roots with no subclasses [Ctrl-Sh-E]	1
Stubbi	Name resolution (Ctri-Sh-Y) Remove redundant superclasses on edit Set name resolution vigor - to (Numeric arg) (current value is 4)	pr (fi



- Select "Shared the same name...: Weapon of Mass-Destruction, Weapon of Mass-Destruction\$-In-Cyc-Products-10\$"
- Merge classes by selecting it from the "Class" menu

Mode: 12 setive commands	Numeric arg
View: 15 active commands	
Name: WEAPON-OF-MASS-DESTRUCTION	Pretty name: Weapon-Of-Mass-Des
🔩 🕅 📚 Names to resolve: Shared the same	name at load time: Weapon-Of-Mass-Destruction
Durable-Goods (from cyc-products) Military-Hardware (from cyc-products)	
Military-Hardware {from cyc-products} Military-Weapon {from cyc-products}	In-Cyc-Products-10 [Go] {from eye-p
Military-Hardware {from eye-products} Military-Weapon {from eye-products} > Weapon-Of-Mass-Destruction Military-Equipment {from eye-products} Military-Hardware {from eye-products}	In-Cyc-Products-10 [Go] (from eye-p
Military-Hardware {from eye-products} Military-Weapon {from eye-products} > Weapon-Of-Mass-Destruction Military-Equipment {from eye-products} Military-Hardware {from eye-products} Military-Weapon {from eye-products}	
Military-Hardware {from eye-products} Military-Weapon {from eye-products} > Weapon-Of-Mass-Destruction Military-Equipment {from eye-products} Military-Hardware {from eye-products} Military-Weapon {from eye-products}	In-Cyc-Products-10 [Go] (from eye-j In-Cyc-Products-10 [Go] (from eye-j





o Result of merging

Analysis: 17 active commands	(\mathcal{D})			
Class: 3 active commands	•			
Decomposition: No active commands	•			
File: 13 active commands	KB arg			
Mode: 12 active commands	Numeric arg 💌			
View: 11 active commands	•			
Name:	Pretty name:			
4 1 2 Names to resolve: Shared the same name	at load time: Weapon-Of-Mass-Destruction, Weapor			
2 classes merged into <u>Weapon-Of-Mass-Destruction</u> {from cyc-products, saie-products-2}				
Durable-Goods {from cyc-products} <u>Military-Hardware</u> {from cyc-products} <u>Military-Weapon</u> {from cyc-products} <u>Weapon-Of-Mass-Destruction</u> {from cyc-products, saic-products-2} <u>Military-Equipment</u> {from cyc-products} <u>Military-Hardware</u> {from cyc-products} <u>Military-Weapon</u> {from cyc-products} <u>Weapon-Of-Mass-Destruction</u> {from cyc-products, saie-products-2}				



And in practice?
 → short demo (about 5 min)

Strengths



- Supports OKBC (Open Knowledge Base Connectivity) standard
- Supports more than 15 input formats (such as ANSI KIF, Ontolingua, Protégé, CLASSIC, iXOL, etc.)
- Supports different editing environments
- Supports the user by suggesting potential merging candidates (based on properties)
- Includes incompleteness tests, syntactic checks, taxonomic analysis, and semantic checks

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Limited consistency checks
User can't add domainspecific tests



Ongoing work

reasoning capabilities
semantic analysis
extensibility
usability by non-experts



References & Resources

Chimaera http://ksl.stanford.edu/software/chimaera/

Chimaera Tutorial http://www.ksl.stanford.edu/software/chimaera/tutorial/

Ontologies

http://www-ksl-svc.stanford.edu:5915/doc/TutorialOntologies/index.html

[McGuinness et al. 2000] Deborah L. McGuinness, Richard Fikes, James Rice, and Steve Wilder. An environment for merging and testing large ontologies. In Anthony G. Cohn, Fausto Giunchiglia, and Bart Selman, editors, KR2000: Principles of Knowledge Representation and Reasoning, pp. 483–493, San Francisco, Morgan Kaufmann, 2000.