Participating OWL DL Reasoners

- **FaCT++** (tableau reasoner) by Dmitry Tsarkov
- **JFact** (a Java port of the FaCT++) by Dmitry Tsarkov, Ignazio Palmisano
- **HermiT** (hypertableau) by Boris Motik, Rob Shearer, Birte Glimm, Giorgos Stoiilos, Ian Horrocks
- **Konclude** (tableau, parallel) by Andreas Steigmiller, Thorsten Liebig, Birte Glimm
- **TReasoner** (tableau) by Andrey Grigoryev

Portfolio Reasoners

- **Chainsaw** (uses Atomic Decompositions) by Dmitry Tsarkov, Ignazio Palmisano
- **MORe** (uses module extraction techniques) by Ana Armas Romero, Ernesto Jimenez Ruiz, Bernardo Cuenca Grau, Ian Horrocks, Cristina Feier

Approximation-Based Reasoners

- **TrOWL** by Jeff Z. Pan, Yuan Ren, Edward Thomas, Nophadol Jekjantuk, Stuart Taylor, Jhonatan Garcia
Participating OWL EL Reasoners

- **ELepHant** by Baris Sertkaya
- **ELK (parallel)** by Yevgeny Kazakov, Markus Krötzsch, František Simančík, Pavel Klinov
- **jcel** by Julian Mendez
The Disciplines

Classification

- Classify an OWL 2 DL/EL ontology
- DL: Chainsaw, FaCT++, HermiT, JFact, Konclude, MORe, TReasoner, TrOWL
- EL: Chainsaw, ELepHant, ELK, FaCT++, HermiT, jcel, JFact, Konclude, MORe, TReasoner, TrOWL

Consistency

- Check whether an OWL 2 DL/EL ontology is consistent and has a model
- DL: Chainsaw, FaCT++, HermiT, JFact, Konclude, MORe, TReasoner
- EL: Chainsaw, ELepHant, ELK, FaCT++, HermiT, jcel, JFact, Konclude, MORe, TReasoner

Realisation (★ new in 2014 ★)

- Identify the types of all individuals in an OWL 2 DL/EL ontology
- DL: Chainsaw, FaCT++, HermiT, JFact, Konclude, TrOWL
- EL: Chainsaw, ELepHant, ELK, FaCT++, HermiT, JFact, Konclude, TrOWL
The Corpus

- 16 555 unique ontologies
- Sources:
  - MOWLCorp (Manchester OWL Corpus)
    [http://mowlrepo.cs.manchester.ac.uk](http://mowlrepo.cs.manchester.ac.uk)
    - Web Crawl,
    - Google Custom Search API
    - User Submissions
  - Oxford Ontology Library
  - BioPortal Snapshot June 2014
  - User submitted ontologies
    - BioKB (2013), DMOP, FHKB, USDA, DPC, genomic-CDS, City-Bench,...
- Get: [http://zenodo.org/record/10791](http://zenodo.org/record/10791)
The Tested Ontologies

Create a file list iterating through the bins
Skip emptied bins
Use the first X files for the competition

<table>
<thead>
<tr>
<th></th>
<th>X (OWL DL)</th>
<th>X (OWL EL)</th>
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<tr>
<td>Classification</td>
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<td>300</td>
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<td>Consistency</td>
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<td>250</td>
</tr>
<tr>
<td>Realisation</td>
<td>200</td>
<td>250</td>
</tr>
</tbody>
</table>

16 555 (4 395)

2 327 (483)
What Is Measured

OWL Ontology
- non-trivial
- in profile

Reasoning Task
- realisation
- classification
- consistency checking

Reasoner

Success
- expected result
- in time

Failure
- errors
- timeouts
- unexpected result

- A result is expected if the majority of the reasoners agree on it
- In case of a draw, one result is randomly chosen and declared expected
- In time: <= 2.5 min for reasoning, <= 3 min for reasoning + parsing
The Hardware

- Cluster at the University of Manchester provided by Konstantin Korovin
- QuadCore Intel Xeon CPU@2.33GHz
- Running a rather old Fedora 12
- Java version 1.6.0_18
- One reasoner per machine
- 12GB RAM, 10GB RAM for the reasoner
**Competition Results**

**OWL DL Consistency**
1. Konclude
2. Chainsaw
3. HermiT

**OWL DL Classification**
1. Konclude
2. HermiT
3. MORe

**OWL DL Realisation**
1. Konclude
2. FaCT++
3. TrOWL
## Competition Results

### OWL EL Consistency
1. ELK
2. Konclude
3. MORe

### OWL EL Classification
1. Konclude
2. MORe
3. ELK

### OWL EL Realisation
1. Konclude
2. TrOWL
3. FaCT++
Betting Winners

- Draw a ticket
- Guess how many ontologies the drawn reasoner can classify
- Shortened coffee break ➔ less time for betting 😞
- Still 26 bets were made

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Winner</th>
<th>Reasoner</th>
<th>Max</th>
<th>Bet</th>
<th>Real</th>
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<td>Pavel Klinov</td>
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<td>EL Classification</td>
<td>Elena Botoeva</td>
<td>ELK</td>
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<td>284</td>
<td>284</td>
<td>0</td>
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</tbody>
</table>
Olympic Medal Winner

- Only three winners per competition allowed 😞
- Reasoners ranked according to Expected Results / Tasks Attempted

1. Konclude with 95.5%
2. ELK with 86.4%
3. MORe with 85.7%

Award Ceremony
Monday, July 21st
16:30-19:00
Kuppelsaal
Challenges for Next Year

• Getting OWL QL reasoners to participate
• Finding Organisers (Volunteers?)
  • Collecting Ontologies (OWL QL)
  • Collecting Queries for a Query Answering discipline
  • Working with the reasoner developers
  • Organising sponsorship
  • T-shirts & betting
• Improving the competition framework
  • Web-based reasoner submission system with automatic tests for compliance with the framework
  • Better automatic results evaluation
The Competition Organisers

ORE Competition Organisers
- Birte Glimm (University of Ulm)
- Nicolas Matentzoglu (University of Manchester)
- Bijan Parsia (University of Manchester)
- Andreas Steigmiller (University of Ulm)

Competition Infrastructure
- Konstantin Korovin (University of Manchester, Royal Society grant RG080491)

Local Organisers
- Magdalena Ortiz (Vienna University of Technology)
- Mantas Šimkus (Vienna University of Technology)

Olympic Games Chair
- Thomas Krennwallner (Vienna University of Technology)

Sponsors

![B2i Healthcare](image)
![DeepL](image)