

# SeaLion: An Eclipse-based IDE for ASP with Advanced Debugging Support

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Supported by the Austrian Science Fund (FWF) under project P21698

## Motivation

Answer-Set Programming:

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- ▶ *lack of tools* for supporting the development of ASP programs

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One obstacle for a wider acceptance:

- ▶ *lack of tools* for supporting the development of ASP programs
- ➡ In 2009, we started a research project @ Vienna University of Technology:
- ▶ The mission: explore methods and methodologies for developing answer-set programs
  - ▶ Topics: debugging, testing, programming methodologies, . . .
  - ▶ A major goal: make project results accessible in tools that are incorporated in an *Integrated Development Environment (IDE)* for ASP

# SeaLion

## SeaLion

The Integrated Development Environment  
for Answer-Set Programming



## SeaLion (ctd.)

*SeaLion*, an integrated development environment for ASP

- ▶ Supports the *major ASP languages* (Gringo and DLV)
- ▶ implemented as plugin of the popular *Eclipse platform*
- ▶ modular design: can be extended by other Eclipse plugins
- ▶ publicly available (GPL 3.0)

## SeaLion (ctd.)

Important features:

- ▶ source-code editors for the languages of the most prominent ASP solvers Gringo/Clasp and DLV
- ▶ syntax highlighting, syntax checking, visual program outline, refactoring
- ▶ support for launching solvers
- ▶ debugging features (stepping, ouroboros)
- ▶ visualisation of answer sets (Kara-plugin)
- ▶ LANA annotations and documentation generation
- ▶ UML class diagrams for ASP domain modelling, UML objects diagrams for answer-set visualisation

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Other IDEs for ASP: APE (Sureshkumar et al., 2007), ASPIDE (Febbraro, Reale, and Ricca, 2011), iGROM (Koziarkiewicz, 2011)

# Debugging



SeaLion is the first IDE for ASP with *debugging* features that work for real-world answer-set programs:

- ▶ implements *stepping*-based debugging (Oetsch, Pührer, and Tompits 2011)

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- ▶ stepping is a central debugging feature of many integrated development environments (IDEs)

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We devised a framework that allows for

- ▶ building an answer set the user has in mind by
- ▶ stepwise adding further active rules: a rule is *active* if its body is satisfied

## Stepping in ASP (ctd.)

Stepping *emulates a bottom-up computation* of an interpretation:

- ▶ user serves as an oracle, choosing rules considered to be active
- ▶ atoms in the rule are added to the interpretation or remembered to be false
- ▶ considered interpretation grows monotonically
- ▶ computation results in an answer set of is guaranteed to get stuck
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Two ways to extend a computation:

- ▶ *Steps*: considering a further single ground active rule
- ▶ *Jumps*: considering multiple rule at once (to quickly considering rules that are not of interest)



Live demo

# Summary and Outlook

We presented SeaLion, a comprehensive IDE for ASP

- ▶ compatible with major solvers
- ▶ support for stepping-based debugging
  - ▶ intuitive debugging approach
  - ▶ approach has been studied also for DL-programs (Oetsch, Pührer, and Tompits 2012)

Future Work:

- ▶ further automate stepping
- ▶ research into representation refactoring

# Finally

➡ Visit our website: <http://www.sealion.at> !