

EmbASP

thanks to Davide Fusca

Motivations

- Answer Set Programming (ASP) is mature for practical applications
 - Declarative and Imperative languages integration
 - Ease the development of ASP-based applications, in both educational and real-world contexts
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- ICT industry is moving towards the mobile scenario
 - Lack of works about ASP systems natively running on mobile devices

Answer Set Programming

A purely declarative AI formalism for Knowledge Representation and Reasoning developed in the field of Logic Programming and Nonmonotonic Reasoning :

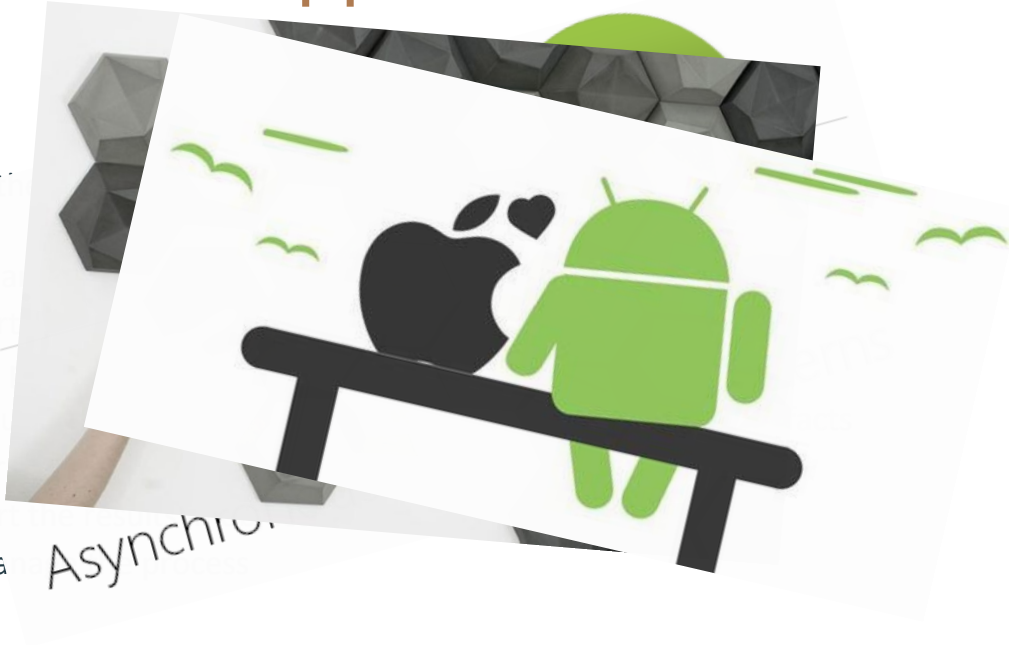
- language based on rules, allowing for both disjunction in rule heads and nonmonotonic negation in the body
- use logic program to represent a given computational problem
- an answer set solver is used to find the models, called answer sets, which correspond one-to-one to solutions of the computational problem

ASP Based Application

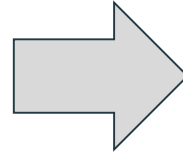
Using ASP in

- S
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ASP Based Application



ONE DOES NOT SIMPLY



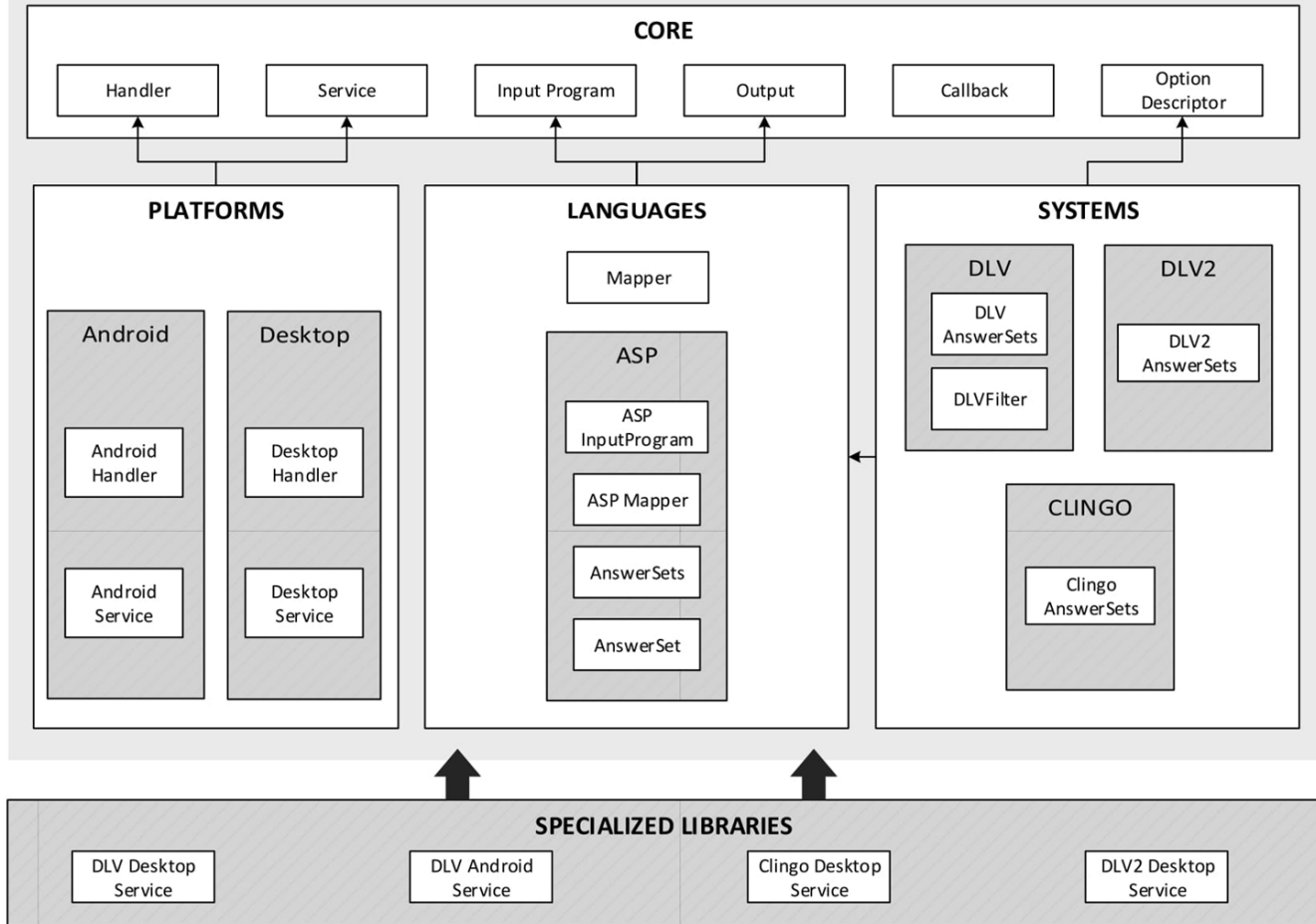
REINVENT THE WHEEL

EmbASP



- **EmbASP**: an abstract framework for the integration of ASP in external systems for generic applications
- An actual Java implementation of the framework with specialized libraries for two state-of-the-art ASP systems
- Some fully functional applications developed in the educational context

THE EMBASP FRAMEWORK



The ASPMapper

Two-way “translator” between strings recognizable by the ASP solver at hand and Java objects directly employable within the application

- Guided by the Java Annotations
- Uses the Java Reflection mechanisms to examine the Annotation at run-time and perform the translation
- Give developers the possibility to work separately on the ASP-based modules and on the Java side

A meme featuring a character from the movie 'The Last of Us' shouting 'ENOUGH TALK SHOW ME A DEMO!!!' while holding a large knife. The character is shown from the chest up, wearing a brown, layered tunic. He has a dark beard and a wide-eyed, intense expression with his mouth open in a shout. A large, dark, curved blade is held in his right hand, pointing upwards and to the left. The background is a blurred, outdoor setting with dry, brownish vegetation and a hazy sky. The text is overlaid in large, white, bold, sans-serif font with a black outline.

ENOUGH TALK

**SHOW ME A
DEMO!!!**

How to use EmbASP to build an application

Build an Java application for solving Sudoku puzzles using EmbASP

- We have a proper logic program to solve a sudoku puzzle
- We have also an initial schema

5	3			7				
6			1	9	5			
	9	8					6	
8				6				3
4			8		3			1
7				2				6
	6					2	8	
			4	1	9			5
				8			7	9