

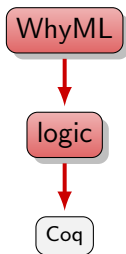
CAV 2019

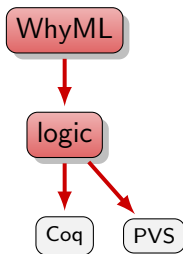
Intermediate Verification Languages

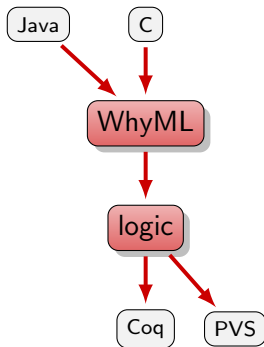
Jean-Christophe Filliâtre

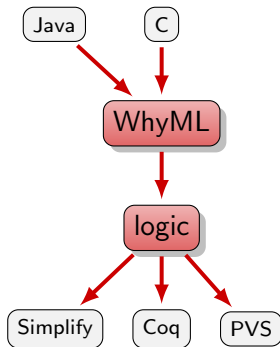
CNRS

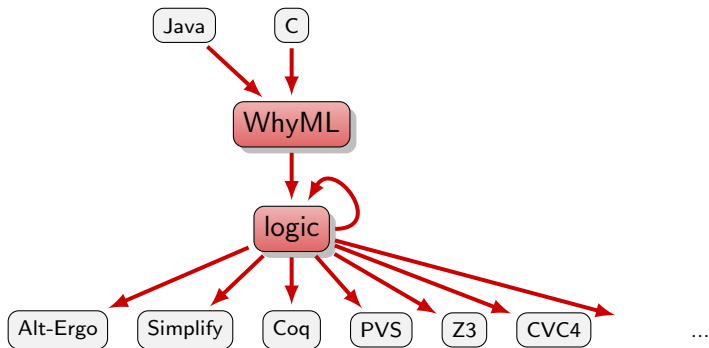


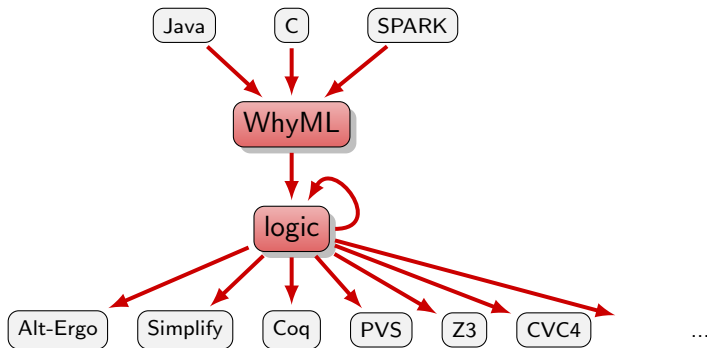


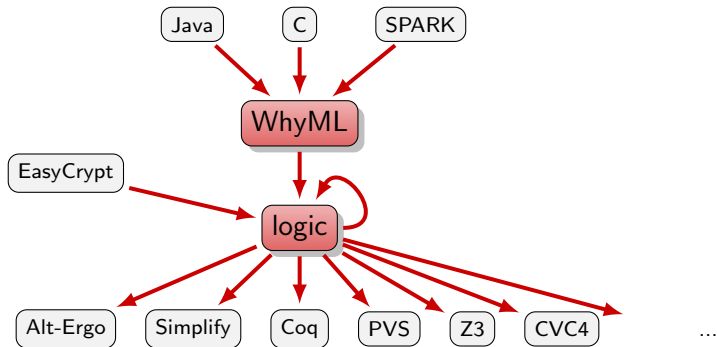


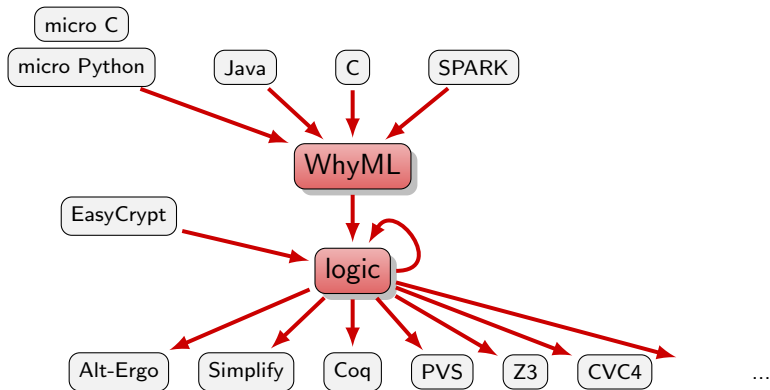


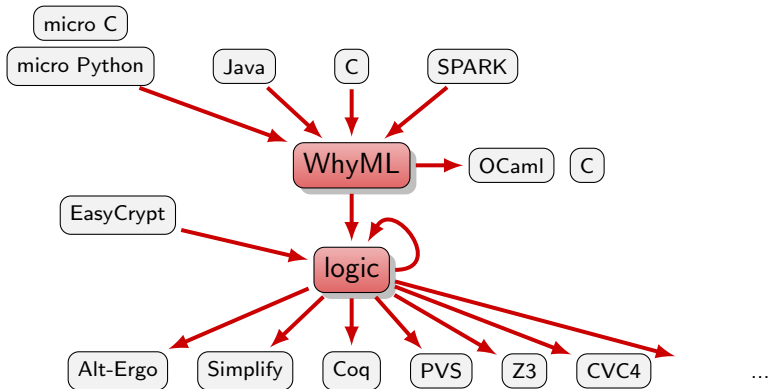










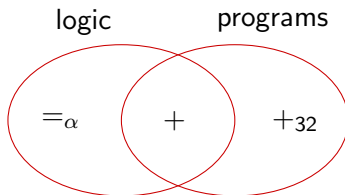


1. designing a logic

[FroCos 11, CADE 13, VSTTE 14]

- type polymorphism
- data types, pattern matching
- FOL, yet λ -notation

1. designing a **logic** [FroCos 11, CADE 13, VSTTE 14]
2. designing a **programming language**, WhyML [ESOP 13, CAV 14]
 - polymorphism, data types, pattern matching, exceptions
 - mutable data with controlled aliasing
 - ghost code and ghost data



1. designing a logic [FroCos 11, CADE 13, VSTTE 14]
2. designing a programming language, WhyML [ESOP 13, CAV 14]
3. logic and programming libraries
 - useful theories, e.g.

$$\text{sum } f \text{ a } b \stackrel{\text{def}}{=} \sum_{a \leq i < b} f(i)$$

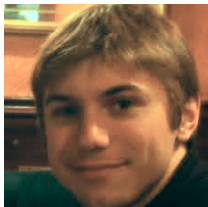
- floating-point arithmetic
- Coq models of axiomatic theories

[ARITH 2007]

1. designing a logic [FroCos 11, CADE 13, VSTTE 14]
2. designing a programming language, WhyML [ESOP 13, CAV 14]
3. logic and programming libraries
4. an interface with theorem provers [Boogie 11]
 - currently support for 25+ ITPs and ATPs

1. designing a logic [FroCos 11, CADE 13, VSTTE 14]
2. designing a programming language, WhyML [ESOP 13, CAV 14]
3. logic and programming libraries
4. an interface with theorem provers [Boogie 11]
5. build/save/replay/update proofs [VSTTE 13]

the Why3 team today



François Bobot



Claude Marché



Guillaume Melquiond



Andrei Paskevich



Sylvain Conchon

designed and implemented the
Alt-Ergo SMT solver

*Implementing Polymorphism in
SMT solvers [SMT 2008]*



Johannes Kanig



Léon Gondelman



Mário Pereira

Martin Clochard

Raphaël Rieu-Helft

Quentin Garchery

- Albin Coquereau
- Asma Tafat-Bouzid
- Benedikt Becker
- Benjamin Monate
- Clément Fumex
- Daisuke Ishii
- David Hauzar
- David Mentré
- Florian Schanda
- Gabriel Scherer
- Jacques-Pascal Deplaix
- Johannes Kanig
- Julien Thierry
- Kim Nguyễn
- Léo Andrès
- Maxime Dénès
- Pierre-Yves Strub
- Piotr Trojanek
- Ralf Treinen
- Rehan Malak
- Simão Melo de Sousa
- Simon Cruanes
- Stefan Berghofer
- Steve Langasek
- Sylvain Dailier
- Sylvie Boldo
- Thi-Minh-Tuyen Nguyen
- Yannick Moy

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