IBEX 2.0

G. Chabert

SWIM 2012 – Oldenburg -Germany

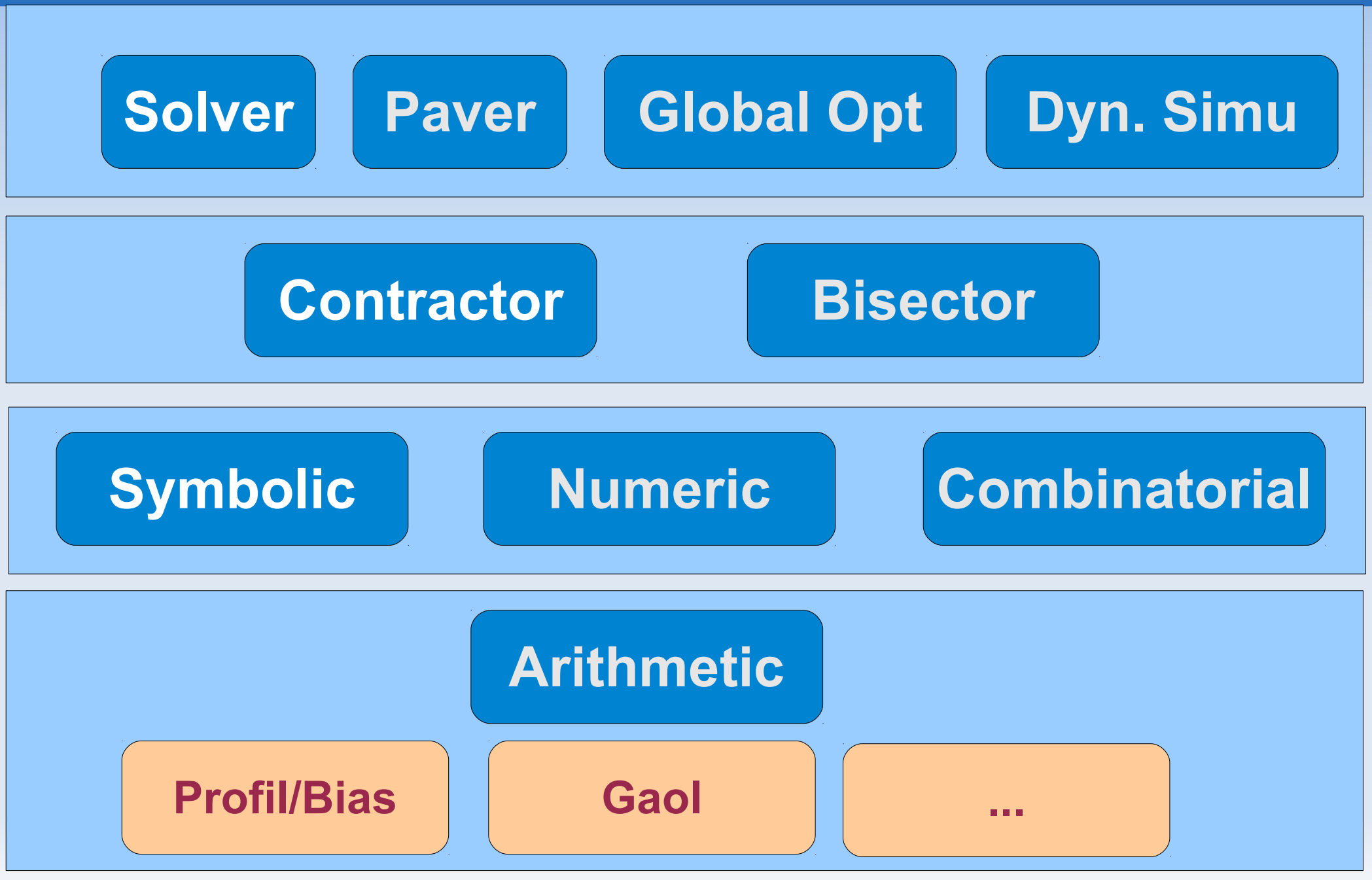
IBEX 2.0 – key points

- A C++ library for interval computation
- Free software (LGPL)
- With a team
- Short history
  - 2003: First prototype
  - 2007: Ibex 1.0 on the web (*www.emn.fr/z-info/ibex*)
  - 2009: The Quimper language («*Contractor Programming*», *Artificial Intelligence*)
  - 2011: A competitor in global optimization («Inner Regions and Interval Linearizations for Global Optimization», *AAAI'11*)
- Ibex 1.0: Good performance but not very good design

IBEX 2.0 – key features

- A multi-layered library allowing different usage:
  - from basic interval arithmetic
  - to high-level branch & bound (eg: global optimization)
- Simple and clean interfaces at each layer
- Based on the contractor paradigm
  - A contractor C is a (generic) operator from IR^n to IR^n
  - Variety of algorithms: numerics, combinatory, signal processing... *(«Interval Among Constraint», CPAIOR'12)*
  - Compositionality
- Hybridation of discrete and continuous domain (2013)

IBEX 2.0 – architecture



IBEX 2.0 - Future

- Summer 2012: Tests
- September 2012: First release
- Early 2013: + discrete domains (*Ibex*+*Choco*)
- Fall 2013: + dynamical systems (*Ibex*+*Ariadne*)