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**CAMPAM Bellairs – 22-29 avril 2007**

- Born in Mali (west Africa)
- MS (1987) in Mathematics of the Blaise Pascal University
- PhD (1992) in CS of the Blaise Pascal University
  *“Discrete Event Simulation of resource sharing Distributed Systems using Ada language”*
- Maître de Conférences (1994)

# Axiomatic mathematical and computational theory of modeling and simulation

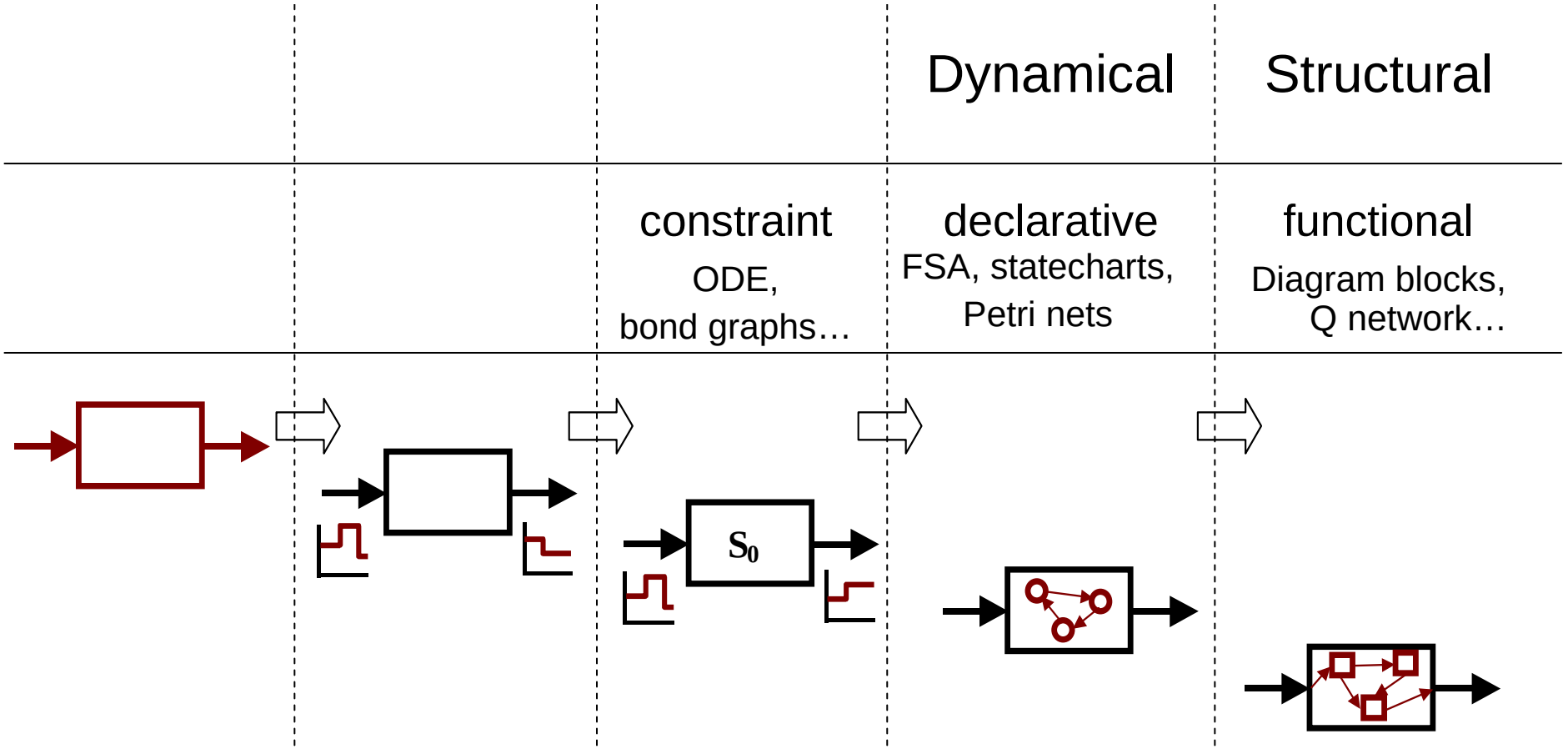
## with emphasis on

## Discrete Event Systems Specification (DEVS)

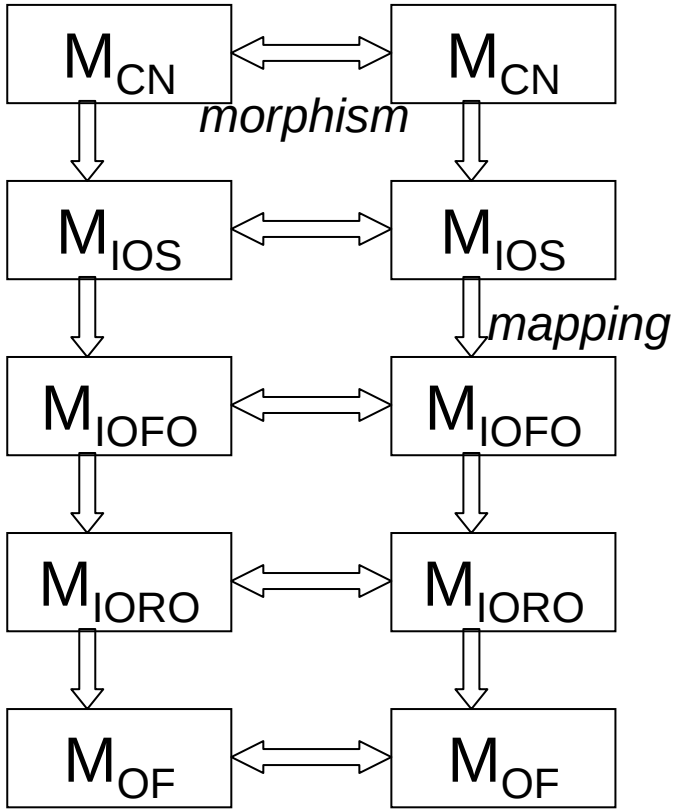
- **Comprehensive formal basis** for modeling and simulation
  (*Specification: views, formalism, methodologies*)
- **Logic semantics and symbolic reasoning** for unambiguous interpretation and metrics evaluation
  (*Analysis: algebraic and operational metrics*)
- **(automated) Code synthesis**, to ease rapid prototyping and experimentation
  (*Generation: algorithm, middleware*)
- **Simulation-based problem solving**, including method coupling, generic architectures...
  (*Application: embedded simulation, forecasting and investigating*)

# Specification

- (Generalized? Unified?) dynamic systems specification
  multi-view, multi-abstraction, multi-formalism, multi-scale, multi-aspect…: how to put them in the big picture?
- Model/Context duality
  requirements, objectives, assumptions, constraints…: orthogonal view or upper level of abstraction ?




- $M_{CN} = <X, Y, T, \Omega, D, \{M_d, d \in D\}, EIC, EOC, IC>$
- $M_{IOS} = <X, Y, T, \Omega, S, \delta_{ext}, \delta_{int}, \lambda, t_a>$
- $M_{IOFO} = <X, Y, T, \Omega, F >$
- $M_{IORO} = <X, Y, T, \Omega, R>$
- $M_{OF} = <X, Y, T>$


$M_{CN}$
$M_{CN}$
*morphism*
$M_{IOS}$
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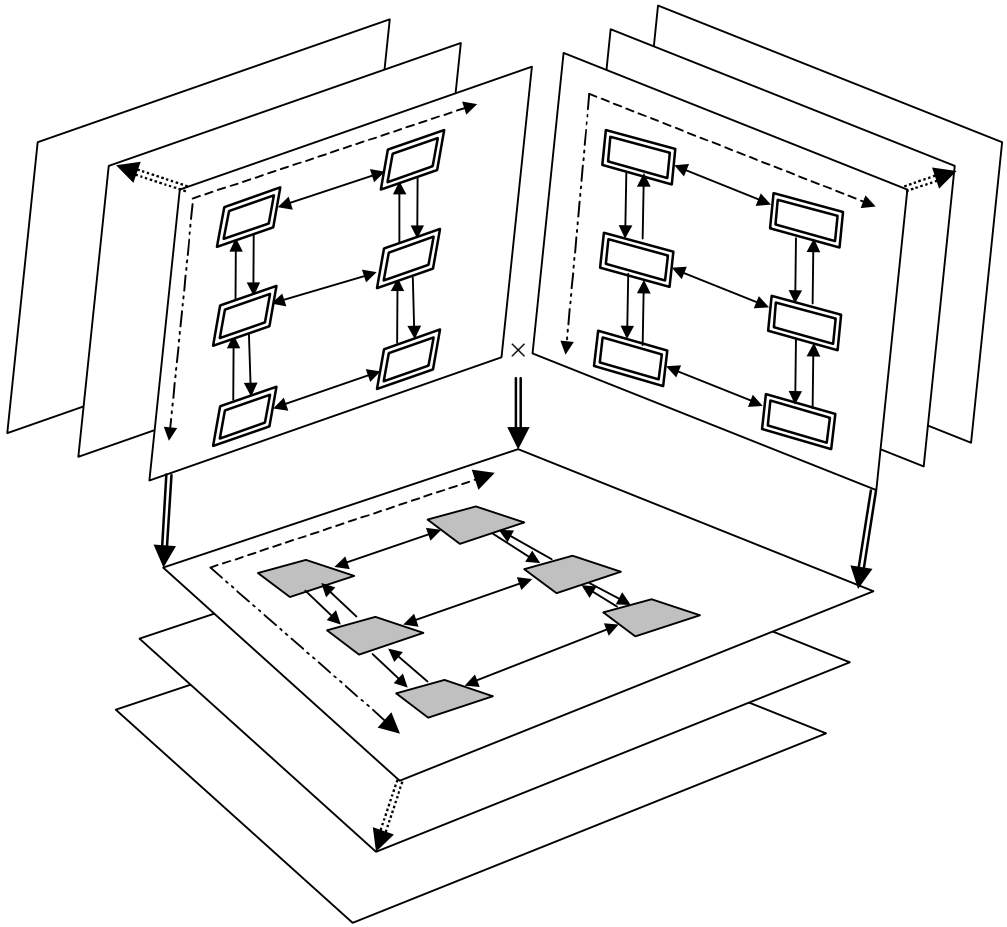

***Legend***

- Conceptual **formalisms** (respectively for experimental frames space and models space)
- Execution language (simulators space)
- Level of resolution
- Level of specification
- Abstraction level
- World view
- Association mapping
- System morphism
- Implementation
- Formalism transformation
- × Cross-product (experimental frames and models)

# Question:
# Meta-knowledge in model abstraction

- Can we have a standardized hierarchy of abstraction levels (some kind of unification of modeling methodologies)?
- What key knowledge are conveyed in each of these levels (logic, dynamics, structure... and key details: static and temporal aspects)?
- Relation to formalisms (back to some "universal" formalisms)?