TRAME Team

- PhD on the analysis and verification of real-time systems (UML/PNO)

  – Timing constraints, coupling UML and Time Petri Net (with linear logic)

- Associate professor in a French engineering school (ESEO), Angers (west of France)

- Since 2004, leader of the TRAME team

TRAME (TRAnsformations de **M**odèles pour l'**E**mbarqué)

Model Transformations for Embedded systems

Goal :
- Developing semi-automatic assistants for the development of embedded systems using Model Driven Approach
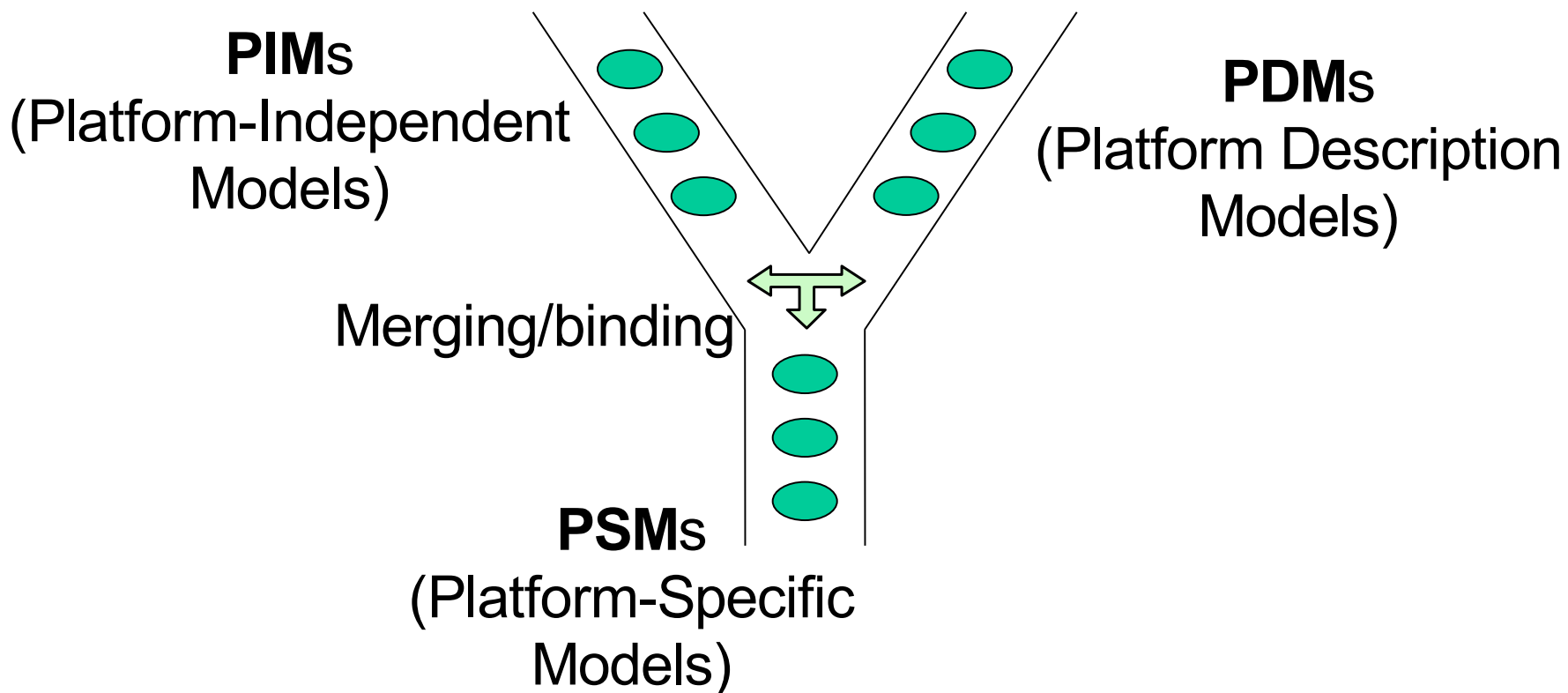
In adapting :
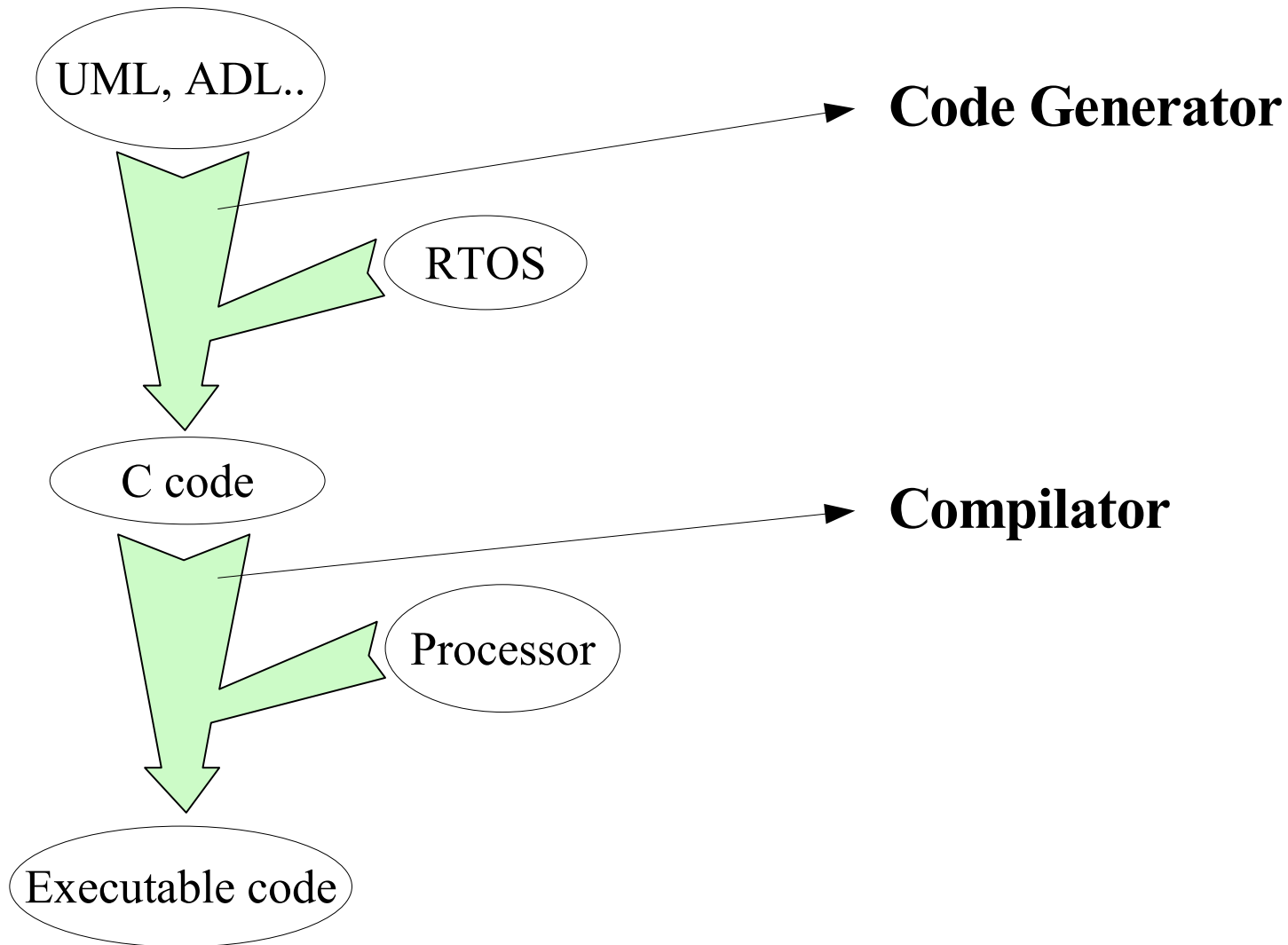- Existing (industrial and/or research) models/tools for co-design

Based on previous or current works :
- High-Level Hardware Synthesis (GAUT)
- Design Flow for Process Control Applications
- Intelligent Sensor Architectures
- UML for Real-Time Systems (UML/PNO, http://argopno.tigris.org)

Past and present collaborations
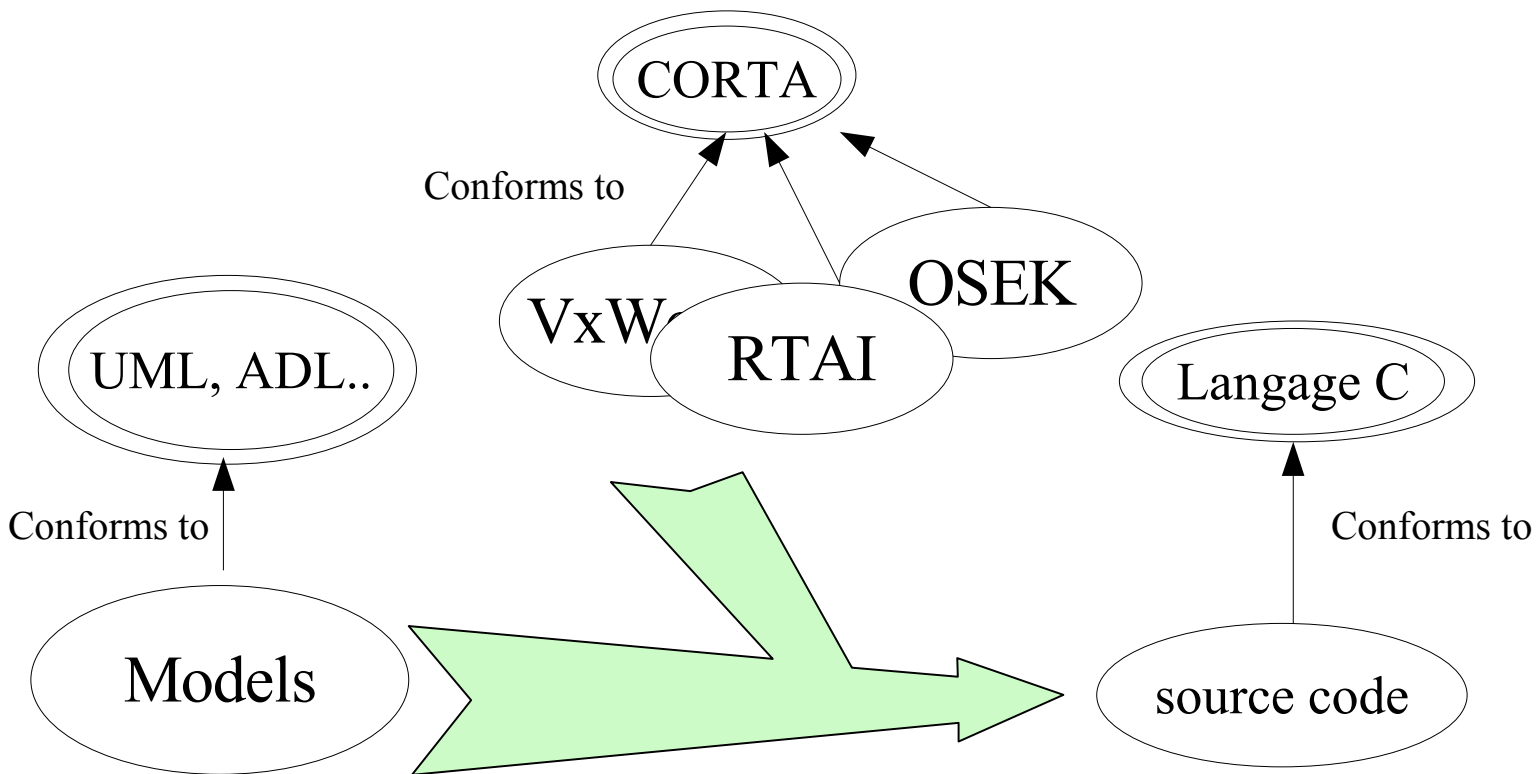
- University
  - On metamodel definition
    - IRCCyN, Nantes (5 masters in 2003/2005)
    - LESTER, Lorient (2 masters in 2004-2005)
    - LAAS, Toulouse
  - On transformation langage
    - ATLAS, Nantes (1 master in 2003)

- Industrial
  - ATMEL, Thales, CEA
  - TopCased (www.topcased.org)
  - Open 4 Autosar

- Definition of UML MARTE profil (future real-time UML profil)
  - www.promarte.org

Meaning of platform for real-time embedded systems ?

PIMs
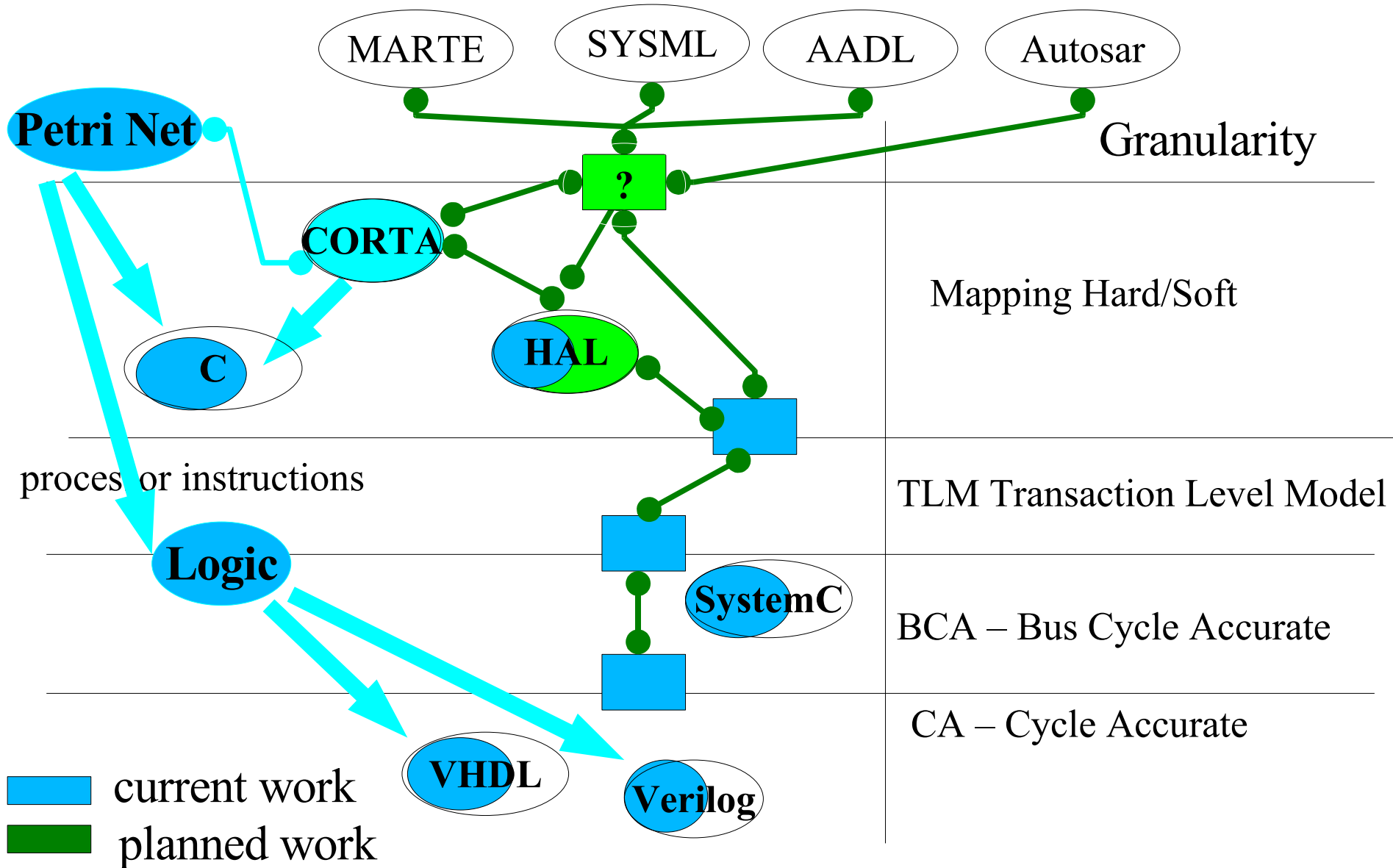(Platform-Independent Models)

PDMs
(Platform Description Models)

Merging/binding

PSMs
(Platform-Specific Models)

UML, ADL..

Code Generator

RTOS

C code

Compilator

Processor

Executable code

CORTA : Concept of Real-Time Application

Different platform abstractions

ESEO

MARTE   SYSML   AADL   Autosar

Petri Net

Granularity

?

CORTA

Mapping Hard/Soft

HAL

proces or instructions

TLM Transaction Level Model

Logic

SystemC

BCA – Bus Cycle Accurate

CA – Cycle Accurate

VHDL

Verilog

current work

planned work

- Everything !
- Discussions and reflexions
- Exchange on experimentations
- Model patterns and Meta-Model zoo
- DSL
- Tools
    - TRAME : experience of ATL, experiment on Eclipse (EMF, GMF and GMT)