**Introduction**

- **Mission**
  - Develop new programming technologies enabling the exploitation of many (100s) core architectures

- **Key Outcomes**
  - Programming and design methods
  - Multi-core programmable architectural solutions
  - Associated supporting tools
  - Evaluation in selected applications

- **Competence Goal**
  - Understand holistic integration of
    - multi-core SoC design
    - embedded software
  - Master smart system design for future applications
    - consumer, wireless, communication and transportation
Application Focus

- Massive real-time data-processing found in the domains of
  - consumer electronics
    - e.g., video surveillance and HD video codecs
  - telecommunications
  - transportation
    - e.g., automotive, avionics and radar

- The results of SMECY will be driven by and demonstrated in a number of industry cases from these domains
- This will cover industrial applications as well as industrial platforms
## SMECY Partners

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<tr>
<th>Country</th>
<th>Industrial partners (19)</th>
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<th>Academic partners (11)</th>
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SMECY Conceptual Approach

Platform 2012
ST

EdkDSP
UTIA

Applications (WP4)

Front-end (WP1)

Back-end (WP2)

Flow 1
Flow 2
Flow 3

Design Flow

SMECY
Platforms: UTIA EdkDSP platform

Figure 10: Basic computing element.
Platforms: UTIA EdkDSP platform (cont’d)

Figure 11: Structure of the EdkDSP
WP1 Application mapping and exploration

- Programming models,
- Optimisation and design space exploration methods and tools
- Requirements and characteristics of
  - a set of application types (from WP4)
  - a set of multi-core platform types (from WP3).

Tasks
- T1.1 Application and programming model
- T1.2 Design space exploration.
- T1.3 Intermediate representation
- T1.4 Data/control transformation and optimisation

Swedish participation: F2M, HH
Methods and tools for platform dependent optimisation and execution code generation
- taking into account
  - application constraints
  - multi-core platform

Tasks
- T2.1 Analysis for application constraints propagation and platform dependent parameters extraction
- T2.2 Platform dependent optimization
  - Data sharing / Interconnection, Memory map, HW constraints management
- T2.3: Execution code generation

Swedish participation: None
Innovative solutions for

- Programmability
- Virtualization
- Acceleration of parallel execution
- Runtime execution support

Tasks

- T3.1 Multi-core architecture for programmability and predictability (new features that make programming easier)
- T3.2 Virtualization, composability and execution model
- T3.3 Acceleration of parallel execution
- T3.4 Runtime execution supporting fault tolerance, reliability and dynamic reconfiguration

Swedish participation: HH, RTE
WP4 Application domains

- Case studies in various application domains with the purpose of:
  - defining requirements and constraints
  - performing validation, assessment and evaluation of method, tool and architecture solutions
    - at mid-term and towards the end of the project

- Tasks
  - T4.1  Radar signal processing and earth observation
  - T4.2  Multimedia, mobile and wireless transmission
  - T4.3  Stream processing (Video surveillance)
  - T4.4  Benchmarking and Cross-Validation

- Swedish participation: SMW, F2M, HH
Some figures

- Number of partners: 30
  - 19 industrial, 11 academic

- Number of countries: 9

- Number of person-months: 1915 (= 160 person-years)

- Total budget: 20 399 K€
  - EU funding: 3 406 K€
  - National funding: 6 474 K€
  - Partners’ own funding: 10 519 K€

- Project duration: 36 months