VERIMAG
A leading research centre in embedded systems since 1992

ANNUAL
2011: Election of Joseph Sifakis to the French Academy of Science
2009: Best scientific publication award of the National Foundation of Research in Aeronautics and Space to Saddle Bensalem
2007: Turing award, the highest recognition in Computer Science, to Joseph Sifakis, shared with Ed Clarke and Alan Emerson
2006: Michel Monpetit Prize of the French Academy of Science to Paul Cousi and Nicolas Halbwachs
2002: CNRS Silver Medal to Joseph Sifakis

TECHNOLOGY TRANSFER
• The Lustre programming language and its compilation principles are integrated into the SCADE tool (Ipsilon Technologies) which is an international de facto standard for critical real-time software.
• Use of the BIP formalism and tool box for programming the PROBA satellite (ESTRACK).

IMPACT ON RESEARCH
Pioneering role in several domains:
• Model-checking (Turing Award)
• Synchronous languages (Michel Monpetit Prize)
• Timed and hybrid systems modeling and verification
• Predicate abstraction and invariant generation - taken up and further developed e.g. in SAL (DRR) and Slam (Microsoft)

STRUCTURING THE RESEARCH COMMUNITY
1989: Co-founder of the Conference on Computer-Aided Verification (CAV), top conference in its domain
2001: Co-founder of the EMSOFT conference, one of the main conferences on foundations for embedded software development
2002-2011: Coordination of the ARTIST European Network of Excellence on the Design of Embedded Systems gathering 35 major European teams in the area
Since 2007: Direction of the CARNOT Institute «Intelligent Software and Systems» in Grenoble

VERIMAG: KEY PARTICIPANT IN:
• CARNOT Institute LSI
• Cluster of excellence PERSYVAL-Lab
• PILS Integration Research Center of the International Software and Smart Systems Cluster

Grenoble, the capital of the French Alps, is one of the main research and high technology centres in Europe:
• 5 international research centres: IDEFI, IUT, IGB, ISM, IRIT
• 11 international research institutes: ENSIEG, INSP, LCA, MINES, ISTECA
• 2 international competitiveness clusters: Microelec and TerrAd

VERIMAG: LEADING CENTER IN INFORMATION AND COMMUNICATION TECHNOLOGIES
• Pioneering role in several domains including:
  • Artificial intelligence and robotics
  • Embedded systems and cyber-physical systems
  • Cyber-security
  • Subsonic and supersonic flight simulation
  • 1000 engineering and master students graduating every year
  • 2 national research teams (CNRS-LIST)
  • Several major companies in Information and Communication

www.verimag.imag.fr
From language design to modelling, implementation and formal validation methods for embedded systems and networks of embedded systems, with a focus on energy consumption, and deterministic timing; with applications in critical hard real-time control systems, systems-on-a-chip, and sensor networks.

**TEAMS**

**DISTRIBUTED AND COMPLEX SYSTEMS**

Abstraction and tools for the design and implementation of distributed and complex systems with extra-functional properties: hard and soft real-time, security, performance.

**WIRELESS SENSOR NETWORKS**

Providing formal models and virtual prototyping tools for studying energy consumption in wireless sensor networks;

- Protocols and distributed algorithms for WSNs
- Energy-efficient programming of sensor nodes
- Generators for energy consumption and security properties

**VERIMAG**

**RESEARCH TOPICS**

**SOFTWARE VERIFICATION**

- Developing theories and tools for scalable software verification.
- Multi-threading and dynamic recursive data structures
- Abstract interpretation and virtual data structures
- Monitoring properties of security properties
- Interactive checking and termination proofs

**IMPLEMENTATION OF EMBEDDED SYSTEMS**

- Foundation-aware techniques
- Support for correct-by-construction integration of components
- Synchronous programming of device drivers for global real-time applications

**HUMAN RESOURCES**

- 10 junior researchers
- 31 permanent researchers
- 23 PhD students
- 23 Postdocs and research engineers
- 1 support staff

**SYSTEMS
designing and implementation**

- Active contracts
- National or European grants
- International grants

**BUDGET (2011)**

- Annual global budget (excluding statutory salaries): about 2.5 M€, over 60% of which is from industrial contracts.

**TEAMS**

**VERIMAG**

**SOFTWARE VERIFICATION**

- Developing theories and tools for scalable software verification.
- Multi-threading and dynamic recursive data structures
- Abstract interpretation and virtual data structures
- Monitoring properties of security properties
- Interactive checking and termination proofs

**IMPLEMENTATION OF EMBEDDED SYSTEMS**

- Foundation-aware techniques
- Support for correct-by-construction integration of components
- Synchronous programming of device drivers for global real-time applications

**HUMAN RESOURCES**

- 10 junior researchers
- 31 permanent researchers
- 23 PhD students
- 23 Postdocs and research engineers
- 1 support staff

**SYSTEMS
designing and implementation**

- Active contracts
- National or European grants
- International grants

**BUDGET (2011)**

- Annual global budget (excluding statutory salaries): about 2.5 M€, over 60% of which is from industrial contracts.

**TEAMS**

**VERIMAG**

**SOFTWARE VERIFICATION**

- Developing theories and tools for scalable software verification.
- Multi-threading and dynamic recursive data structures
- Abstract interpretation and virtual data structures
- Monitoring properties of security properties
- Interactive checking and termination proofs

**IMPLEMENTATION OF EMBEDDED SYSTEMS**

- Foundation-aware techniques
- Support for correct-by-construction integration of components
- Synchronous programming of device drivers for global real-time applications

**HUMAN RESOURCES**

- 10 junior researchers
- 31 permanent researchers
- 23 PhD students
- 23 Postdocs and research engineers
- 1 support staff

**SYSTEMS
designing and implementation**

- Active contracts
- National or European grants
- International grants

**BUDGET (2011)**

- Annual global budget (excluding statutory salaries): about 2.5 M€, over 60% of which is from industrial contracts.