RESEARCH CENTER

FIELD
Algorithmics, Programming, Software and Architecture

Activity Report 2014

Section Contracts and Grants with Industry

Edition: 2015-03-24

ARIC Project-Team

7. Bilateral Contracts and Grants with Industry

7.1. Bilateral Contracts with Industry

7.1.1. Contracts with Bosch.

Two studies were conducted for Bosch (Stuttgart) on the numerical aspects of embedded computing. In the first one, Florent de Dinechin and Jean-Michel Muller dealt with the issue of the choice of an adequate representation of numbers (fixed-point or floating-point) for embedded systems. In the second one, Claude-Pierre Jeannerod reported on the stability and accuracy issues of linear system solving in finite-precision arithmetic.

7.1.2. Collaboration with Intel.

INTEL made a $20000 donation in recognition of our work on the correct rounding of functions.

7.2. Bilateral Grants with Industry

7.2.1. Collaboration with Kalray.

Nicolas Brunie has been supported by a CIFRE PhD grant (from 15/04/2011 to 14/04/2014) from Kalray. The purpose was the study of a tightly coupled reconfigurable accelerator to be embedded in the Kalray multicore processor.

7.2.2. Orange Labs PhD Grant.

Marie Paindavoine is supported by an Orange Labs PhD Grant (from October 2013 to November 2016). She works on privacy-preserving encryption mechanisms.

CARAMEL Project-Team

7. Bilateral Contracts and Grants with Industry

7.1. Bilateral Contracts with Industry

7.1.1. Training and Consulting with HTCS

Participants: Pierrick Gaudry, Emmanuel Thomé [contact].

The training and consulting activities begun in 2012 with the HTCS company have been pursued, and the existing contract has been renewed in identical form for 2013, 2014 and 2015.

CASCADE Project-Team (section vide)

CRYPT Team (section vide)

GALAAD2 Team

7. Bilateral Contracts and Grants with Industry

7.1. Bilateral Grants with Industry

7.1.1. Algebraic-geometric methods for design and manufacturing

This collaboration between Inria and Missler in the context of Carnot program, aims at developing algebraic-geometric computational techniques for the control of machining tools. It focuses on the problem of pocket manufacturing and the computation of medial axis and of offsets of planar regions with piecewise algebraic boundaries. An integration of plugins related to AXEL platform into the CAGD modeler TOPSOLID developed by Missler is planned. Laura Saini is involved in this collaboration.

GEOMETRICA Project-Team

7. Bilateral Contracts and Grants with Industry

7.1. Bilateral Contracts with Industry

7.1.1. Cifre Contract with Geometry Factory

Mael Rouxel-Labbé's PhD thesis is supported by a Cifre contract with GEOMETRY FACTORY (http://www.geometryfactory.com). The subject is the generation of anisotropic meshes.

7.1.2. Commercialization of cgal packages through Geometry Factory

In 2014, GEOMETRY FACTORY (http://www.geometryfactory.com) had the following new customers for CGAL packages developed by GEOMETRICA:

LMI Technologies (Canada, GIS): 2D triangulations

Rio Tinto (Australie, mining): 2D triangulations

Geovariances (France, oil and gas): 3D triangulations and meshes

Elektrobit (Allemagne, GIS): 2D triangulations

First Light Fusion (UK, energie): 2D triangulations

GRACE Project-Team

7. Bilateral Contracts and Grants with Industry

7.1. Bilateral Contracts with Industry

7.1.1. Alcatel-Lucent

Within the framework of the joint lab Inria-ALU, Grace and Alcatel-Lucent collaborate on the topic of Private Information Retrieval: that is, enabling a user to retrieve data from a remote database while revealing neither the query nor the retrieved data. (This is not the same as data confidentiality, which refers to the need for users to ensure secrecy of their data; this is classically obtained through encryption, which prevents access to data in the clear.)

A typical application would be a centralized database of medical records, which can be accessed by doctors, nurses, and so on. A desirable privacy goal would be that the central system does not know which patient is queried for when a query is made, and this goal is precisely achieved by a Private Information Retrieval protocol. Note also that in this scenario the database is not encrypted, since many users are allowed to access it.

We are exploring applications of Locally Decodable Codes to Private Information Retrieval in the multi-cloud (multi-host) setting, to ensure both secure, reliable storage, and privacy of database queries.

We hired Man-Cuong Ngo as a PhD student, in February 2014. We proposed a much better way of using LDC codes in PIR protocols, allowing less storage and a very small number of servers. This idea was at the heart of a European patent (EP14305549.9), co-submitted by Inria and Alcatel-Lucent. A preliminary presentation was made at CANS [19].

LFANT Project-Team (section vide)

POLSYS Project-Team (section vide)

SECRET Project-Team

7. Bilateral Contracts and Grants with Industry

7.1. Bilateral Contracts with Industry

- **High Tech Communications Services** ($09/13 \rightarrow 09/14$)
  Recovering a convolutional encoder followed by a block interleaver
  19 kEuros.

7.2. Bilateral Grants with Industry

- **Thales** ($02/14 \rightarrow 01/17$)
  Funding for the supervision of Julia Chaulet's PhD.
  30 kEuros.

SPECFUN Project-Team

7. Bilateral Contracts and Grants with Industry

7.1. Bilateral Contracts with Industry

Mathematical Components (project of the MSR–INRIA Joint Centre).
Goal: Investigate the design of large-scale, modular and reusable libraries of formalized mathematics, using the Coq proof assistant. This project successfully formalized the proof of the Odd Order Theorem, resulting in a corpus of libraries related to various areas of algebra.
Leader: G. Gonthier (MSR Cambridge). Participants: F. Chyzak, A. Mahboubi, E. Tassi.
Website: http://www.msr-inria.fr/projects/mathematical-components/.

VEGAS Project-Team (section vide)

ALF Project-Team

7. Bilateral Contracts and Grants with Industry

7.1. Bilateral Contracts with Industry

7.1.1. Intel research grant ALF-INTEL2014-8957

Participant: André Seznec.

Intel is supporting the research of the ALF project-team on "Mixing branch and value prediction to enable high sequential performance".

ATEAMS Project-Team

6. Bilateral Contracts and Grants with Industry

6.1. Bilateral Contracts with Industry

- ING co-financed one PhD position in the context of CWI public-private collaboration program. The goal is to apply domain-specific language technology to revitalize core banking infrastructure.
- AimValley won the CWI research voucher for developing a DSL for state machines in the context of embedded devices. Davy Landman performed the research and development.

CAIRN Project-Team

7. Bilateral Contracts and Grants with Industry

7.1. Bilateral Contracts with Industry

Automatic Analysis, Classification and Processing of Audio Signals, Contract with Orange Labs.

CAMUS Team

7. Bilateral Contracts and Grants with Industry

7.1. Bilateral Contracts with Industry

The CAMUS team is taking part of the NANO 2017 national research program and its sub-project PSAIC (Performance and Size Auto-tuning thru Iterative Compilation) with the company STMicroelectronics, starting January 2015. Luis Esteban Campostrini has been recruited as PhD student in this project. His work will focus on extending the Apollo framework to dynamic analysis providing useful feedbacks to users regarding code optimization opportunities, and to code generation for ARM Cortex platforms.

COMPSYS Project-Team

7. Bilateral Contracts and Grants with Industry

7.1. ManycoreLabs Project with Kalray

Compsys is part of a bilateral contract with Kalray called ManycoreLabs, funded by “Investissements d’avenir pour le développement de l’économie numérique”. The goal of this project is to allow the company Kalray, based on a collaboration with several partners, to become the European leader of the market of many-core chips for embedded systems. Industrial partners of this project include Bull, CAPS Entreprise, Digigram, Thales, Renault. Academic partners are CEA, Inria (Parkas and Compsys), VERIMAG.

Compsys role is to explore analysis and compilation techniques linked to streaming languages, with the Kalray MPPA platform as long-term target. The research on OpenStream described in Section 6.6 corresponds to the work package WP 2.5.3. This study shows the need for extending polyhedral techniques to polynomials, which is one of the motivation of the work described in Section 6.7 . Finally, the work on parametric tiling (Section 6.9), first in the context of FPGA, then of GPUs, is a first step towards the automatic generation of blocking algorithms for multicores such as the Kalray MPPA.

7.2. Technological Transfer: XtremLogic Start-Up

The XTREMLOGIC start-up (former Zettice project) was initiated 3 years ago by Alexandru Plesco and Christophe Alias, after the PhD thesis of Alexandru Plesco under the guidance of Christophe Alias, Alain Darte and Tanguy Risset. The goal of XTREMLOGIC is to build on the disruptive technologies emerging from the polyhedral compilation community, and particularly the results obtained in Compsys to provide the HPC market with efficient and communication-optimal circuit blocks (IP) for FPGA.

The compiler technology transferred to XTREMLOGIC (see Section 6.2) is the result of a tight collaboration between Christophe Alias and Alexandru Plesco. XTREMLOGIC is a unique opportunity to spread the polyhedral technology to industry.

XTREMLOGIC won several prizes and grants: “concours émergence OSEO 2013” at Banque Publique d’Investissement, “most promising start-up award” at SAME 2013, “lean Startup award” at Startup Weekend Lyon 2012, “excel&rate award 2012” from Crealys incubation center.

DREAMPAL Team

6. Bilateral Contracts and Grants with Industry

6.1. Bilateral Contracts with Industry

Collaboration contract with Nolam Embedded Systems: In conjunction with the CIFRE grant of Venkatasubramanian Viswanathan, a collaboration contract is established with Nolam ES. The objective is to design an innovative embedded computing platform supporting massively parallel dynamically reconfigurable execution model. The use-cases of this platform cover several application domains such as medical, transportation and aerospace.

Collaboration contract with NAVYA: In conjunction with the doctoral grant of Karim Ali, a collaboration contract is established with NAVYA. The objective is to design an innovative embedded system dedicated for dynamic obstacle detection and tracking for autonomous vehicle navigation.

GCG Team

7. Bilateral Contracts and Grants with Industry

7.1. Bilateral Contracts with Industry

- Tirex is a bilateral contract with Kalray. The subject is a prototyping of hybrid alias analysis. The collaboration lead to a recent submission which corresponding work is described in 6.10 .
- GCG is involved in another contract with Kalray associated with the CIFRE PhD of Duco van Amstel. The subject of the collaboration is related to fine grain scheduling. Corresponding work is described in 6.9 .

7.2. Bilateral Grants with Industry

- ManyCoreLabs is a bilateral Grant (BGLE) with Kalray. GCG is involved in the development of generalized register tiling.

PAREO Project-Team (section vide)

POSTALE Team

6. Bilateral Contracts and Grants with Industry

6.1. Bilateral Contracts with Industry

- **EDF R& D**: this is a collaboration with the department SINETICS of EDF in the area of high-performance computing.
  Participants: Marc Baboulin, Grigori Fursin, Amal Khabou.

  It concerns two differents topics:

  – Enhancing performance of numerical solvers using accelerators (postdoc starting in October 2014) and vectorization techniques (internship starting in November 2014).

  – Studying numerical quality and reproducibility in HPC exascale applications (ongoing ANR submission).

- **ARM Ltd**
  Participant: Grigori Fursin.

  UK: this collaboration is related to systematizing benchmarking of OpenCL programs for new ARM GPU architectures and applying machine learning to predict better optimizations (Grigori Fursin).

- **Collaboration with the small size company NumScale** (PME, 10 people) NumScale on C++ parallel code generation technology. NumScale is a start-up created in 2012 as the result of a Digiteo/University Paris Sud technological transfer program (Digiteo OMTE). NumScale exploits scientific results and tools based around code generation for parallel programs as well as advanced code optimization techniques developed by members of the team.

TASC Project-Team

7. Bilateral Contracts and Grants with Industry

7.1. Bilateral Grants with Industry

7.1.1. Gaspard Monge

Participants: Nicolas Beldiceanu, Helmut Simonis.

Title: Gaspard Monge 2.

Duration: 2014.

Type: **continuation of 2012,2013 project**.

Budget: 6000 Euros.

Others partners: EDF.

Within the context of the Gaspard Monge call program for Optimisation and Operation Research we work with EDF on the research initiative on *Optimization and Energy*. The goal of the project (continuation of last year project) is first to extract constraints from daily energy production temporal series issued from the 350 production plants of EDF, second to see how to use these constraints in order to reduce the combinatorial aspect of the daily production planning solving process. The work is based on the CP 2012 model seeker.

7.2. Bilateral Contracts with Industry

7.2.1. Labcom TransOp

Participants: Charles Prud'Homme, Xavier Lorca.

Title: TransOp.

Duration: 2014-2016.

Type: **new project**.

Budget: 300000 Euros.

Others partners: Eurodécision.

The goal of the project is to handle robustness in the context of industrial timetabling problems with constraint programming using CHOCO. The project is managed by Xavier Lorca.

AOSTE Project-Team

7. Bilateral Contracts and Grants with Industry

7.1. Bilateral Contracts with Industry

7.1.1. Kontron PhD CIFRE thesis

Participants: Mohamed Bergach, Robert de Simone.

Kontron Toulon (formerly Thales Computers) has a strong interest in finding optimal (or at least efficient) mapping of applications extensively based on FFT computations (mostly radar detection), onto GPGPU architectures of the Intel IvyBridge/Haswell family (that ar ethen integrated into avionic subsystems at Kontron). This is the main topic of Mohamed Bergach PhD thesis, which should be defended in late Spring 2015. A publication is under submission.

7.1.2. Airbus PhD CIFRE thesis

Participants: Liliana Cucu-Grosjean, Cristian Maxim.

As part of a larger collaborative programme between Inria and Airbus, the PhD thesis of Cristian Maxim has started in March 2014. This thesis will propose a methodology for obtaining probabilistic worst-case execution times distributions by characterizing the appropriate properties of Airbus applications and platforms. This first year is dedicated to the familiarization of Cristian Maxim to the Airbus applications and platforms.

7.1.3. Astrium/CNES PostDoc

The objective of our collaboration with Airbus Defence and Space and the CNES is to determine how the design and implementation of embedded software and system/network configuration can be largely automated in an aerospace context. The objective is to reduce the design and validation costs (especially in case of system evolutions), while preserving an assurance level superior to that of the Ariane 5 flight program. We are exploring automation of the real-time allocation, scheduling, and code generation using the novel algorithms developed and implemented in the Lopht tool. The application of such techniques also requires extensions at the level of system specification formalisms. This collaboration has funded the post-doctoral period of Raul Gorcitz (started in September 2013, reconducted for one year).

CONVECS Project-Team

7. Bilateral Contracts and Grants with Industry

7.1. Bilateral Grants with Industry

Participants: Hubert Garavel, Abderahman Kriouile, Radu Mateescu, Wendelin Serwe.

Abderahman Kriouile is supported by a CIFRE PhD grant (from March 2012 to March 2015) from STMicroelectronics (Grenoble) on the verification of cache coherency in systems on chip (see § 6.5.1), under the supervision of Guilhem Barthes (STMicroelectronics), Christophe Chevallaz (STMicroelectronics), Grégory Faux (STMicroelectronics), Radu Mateescu (CONVECS), Wendelin Serwe (CONVECS), and Massimo Zendri (STMicroelectronics).

HYCOMES Team (section vide)

MUTANT Project-Team (section vide)

PARKAS Project-Team (section vide)

SPADES Team

7. Bilateral Contracts and Grants with Industry

7.1. Bilateral Contracts with Industry

- With Orange Labs: software architecture for GlobalOS

7.2. Bilateral Grants with Industry

- ST Microelectronics: CIFRE contract for the PhD of Vagelis Bebelis. This work is described in Section 6.2.1 .

TEA Project-Team

7. Bilateral Contracts and Grants with Industry

7.1. Bilateral Contracts with Industry

7.1.1. Toyota Info-Technology Centre (2014-2016)

Title: Co-Modeling of Safety-Critical Multi-threaded Embedded Software for Multi-Core Embedded Platforms

Inria principal investigator: Jean-Pierre Talpin

International Partner (Institution - Laboratory - Researcher):

Virginia Tech Research Laboratories, Arlington (United States)

Embedded Systems Group, Teschnische Universität Kaiserslautern (Germany)

Duration: 2014 - 2016

Abstract: We started a new project in April 2014 funded by Toyota ITC, California, to work with Huafeng Yu (a former post-doctorate of team ESPRESSO) and with VTRL as US partner. The main topic of our project is the semantic-based model integration of automotive architectures, virtual integration, toward formal verification and automated code synthesis. This year, Toyota ITC is sponsoring our submission for the standardisation of a time annex in the SAE standard AADL.

In a second work-package, we aim at elaborating a standardised solution to virtually integrate and simulate a car based on heterogeneous models of its components. This year, it will be exemplified by the elaboration of a case study in collaboration with Virginia Tech. The second phase of the project will consist of delivering an open-source, reference implementation, of the proposed AADL standard and validate it with a real-scale model of the initial case-study.

ANTIQUE Team

7. Bilateral Contracts and Grants with Industry

7.1. Bilateral Contracts with Industry

7.1.1. RTOS Contract

Title: Static Analysis of a Fragment of an Operating-System with ASTRÉEA

Type: Service contract

Duration: June 2014 - December 2014

Partners: École Normale Supérieure (France), CNRS (France), Airbus France (France)

Inria contact: Antoine Miné

Abstract: The aim of the contract is to study the formal verification of the safety of a fragment of a small real-time multi-task operating system. The verification will be performed using the ASTRÉEA analyzer, by adapting and extending the model of parallel executions developed at École Normale Supérieure.

CELTIQUE Project-Team (section vide)

DEDUCTEAM Exploratory Action (section vide)

ESTASYS Exploratory Action (section vide)

GALLIUM Project-Team

7. Bilateral Contracts and Grants with Industry

7.1. Bilateral Contracts with Industry

7.1.1. The Caml Consortium

Participants: Xavier Leroy [correspondant], Damien Doligez, Didier Rémy.

The Caml Consortium is a formal structure where industrial and academic users of OCaml can support the development of the language and associated tools, express their specific needs, and contribute to the long-term stability of Caml. Membership fees are used to fund specific developments targeted towards industrial users. Members of the Consortium automatically benefit from very liberal licensing conditions on the OCaml system, allowing for instance the OCaml compiler to be embedded within proprietary applications.

The Consortium currently has 11 member companies:

- CEA
- Citrix
- Dassault Aviation
- Dassault Systèmes
- Esterel Technologies
- Jane Street
- LexiFi
- Microsoft
- Multitudine
- OCamlPro
- SimCorp

For a complete description of this structure, refer to http://caml.inria.fr/consortium/. Xavier Leroy chairs the scientific committee of the Consortium.

MARELLE Project-Team

7. Bilateral Contracts and Grants with Industry

7.1. Bilateral Contracts with Industry

7.1.1. Collaboration within the Inria/Microsoft Research Joint Centre

We participate in the collaboration *Mathematical Components 2* with Microsoft Research. Currently, the main thrust lies around the exploitation of results in the Mathematical Components library, which was our main point of focus until the completion of the proof of the Feit-Thompson theorem.

MEXICO Project-Team

7. Bilateral Contracts and Grants with Industry

7.1. Bilateral Contracts and Grants with Industry

Our industrial cooperations are currently centered in the IRT SystemX, see below; there are currently no *bilateral* agreements.

PARSIFAL Project-Team (section vide)

PI.R2 Project-Team (section vide)

SUMO Project-Team

7. Bilateral Contracts and Grants with Industry

7.1. Bilateral Contracts with Industry

Several researchers of Sumo are involved in the joint research lab of Alstom and Inria, in a common research team called P22. On Alstom side, this joint research team involves researchers of the ATS division (Automatic Train Supervision). The objective of this joint team is to evaluate regulation policies of urban train systems, to assess their robustness to perturbations and failures, to design more efficient regulation policies and finally to provide decision support for human regulators. The project started in march 2014, and a second phase of the project will start in march 2015, for a duration of three years. This covers in particular the PhD of Karim Kecir.

TEMPO Team (section vide)

TOCCATA Project-Team

7. Bilateral Contracts and Grants with Industry

7.1. Bilateral Contracts with Industry

7.1.1. ProofInUse Joint Laboratory

Participants: Claude Marché [contact], Jean-Christophe Filliâtre, Andrei Paskevich.

ProofInUse is a joint project between the Toccata team and the SME AdaCore. It was selected and funded by the ANR programme "Laboratoires communs", starting from April 2014, for 3 years http://www.spark-2014.org/proofinuse.

The SME AdaCore is a software publisher specializing in providing software development tools for critical systems. A previous successful collaboration between Toccata and AdaCore enabled *Why3* technology to be put into the heart of the AdaCore-developed SPARK technology.

The goal is now to promote and transfer the use of deduction-based verification tools to industry users, who develop critical software using the programming language Ada. The proof tools are aimed at replacing or complementing the existing test activities, whilst reducing costs.

7.1.2. CIFRE contract with Adacore

Participants: Claude Marché [contact], Andrei Paskevich, Claire Dross.

Jointly with the thesis of C. Dross, supervised in collaboration with the AdaCore company, we established a 3-year bilateral collaboration contract, that ended in April 2014.

The aim was to strengthen the usability of the *Alt-Ergo* theorem prover in the context of the GnatProve environment for the verification of safety-critical Ada programs [84]. A focus was made on programs involving Ada containers [85]. C. Dross defended her PhD in April 1st 2014 [14].

7.2. Bilateral Grants with Industry

7.2.1. Intel Grant

Participants: Sylvain Conchon [contact], Alain Mebsout.

S. Conchon has obtained an academic grant by Intel corporation on the development of the Cubicle model checker, for 2 years starting from Dec. 2012 The goal of this project is to develop a new version of Cubicle with significantly improved model-checking power. This required innovative algorithmic enhancements to be implemented and evaluated.

Partner: Intel Strategic Cad Labs in Hillsboro, OR, USA

VERIDIS Project-Team

7. Bilateral Contracts and Grants with Industry

7.1. Project Funded by the Airbus Foundation

Participants: Jingshu Chen, Marie Duflot-Kremer, Pascal Fontaine, Stephan Merz.

This two-year project (2013/2014) funds our work on the analysis of real-time Java programs described in section 6.3 , and in particular 12 months of the salary of Jingshu Chen as a post-doctoral researcher. It is complemented by funds granted by Région Lorraine.

7.2. ADN4SE Project

Participant: Stephan Merz.

Joint work with Damien Doligez of Inria Paris Rocquencourt and Jael Kriener and Tomer Libal at the Joint MSR-Inria Centre.

The ADN4SE project started in 2013 within *Programme d'Investissements d'Avenir: Briques Génériques du Logiciel Embarqué* and is coordinated for Inria by the Gallium team in Rocquencourt. The objective of this project is to develop and commercialize the PharOS real-time micro-kernel operating system. In cooperation with researchers at CEA List, we are contributing to the project by verifying key properties (in particular, determinism) of a high-level model of the system written in TLA$^+$.

CARTE Project-Team (section vide)

CASSIS Project-Team

7. Bilateral Contracts and Grants with Industry

7.1. Research Result Transfer

The BZ-Testing-Tools technology has been transfered to LEIRIOS Technologies, at the end of 2004. LEIRIOS changed its name into 2007 and is now called Smartesting. The partnership between the Cassis project and the R&D department of Smartesting, located at the TEMIS Scientific and Industrial area at Besançon, will be continued through (national and international) projects. F. Bouquet is scientific consultant of Smartesting.

7.2. Electronic Voting Systems

Participant: Véronique Cortier.

A collaboration agreement has been signed between Loria and Scytl, a Spanish company who is proposing solutions for the organization of on-line elections, including legally binding elections, in several countries. We have a collaboration with David Galindo (who joined Scytl in July 2014) on defining security properties for e-voting (privacy as well as verifiability properties) and designing e-voting schemes that meet all these properties. Further contracts may cover the analysis of the solutions developed at Scytl.

7.3. Analysis of Electrum Bitcoin Wallet

Participants: Michaël Rusinowitch, Mathieu Turuani.

Electrum has signed a 2-month contract with Cassis for verifying its electronic bitcoin wallet. The protocol model has been specified in Aslan language and covers then registration of new users, the confirmation phase, and the usage of the wallet by the clients. Many optimisations techniques had to be used to limit state explosion, and *CL-AtSe* has been extended to cover a class of security properties with negative constraints that appear in this model, and might be useful for other protocol analysis. *CL-AtSe* has been applied to several scenarios to verify the security properties, and a few modifications were suggested to Electrum designer.

COMETE Project-Team (section vide)

DICE Team

6. Bilateral Contracts and Grants with Industry

6.1. Bilateral Contracts with Industry

DICE has bilateral contracts with two large companies.

Worldline Wordline is a leader in B2B applications development, and is in the front line to provide new technical solution in the Web 2.0 era. We have a CIFRE partnership contract on the study of flow based architectures both at the data centers and at the Web browser level.

BullSA BullSA is producing and designing next generation Many-Core architecture. Although most of the time these calculators are used in real-time, closed environment such as military equipment, the dynamic, adaptability, and upgradable nature of systems is a real issue. We participate in a joint project to design a management layer for handling dynamic data flow application in a soft real-time context.

PRIVATICS Project-Team

6. Bilateral Contracts and Grants with Industry

6.1. Bilateral Contracts with Industry

6.1.1. XDATA

Title: XDATA.

Type: FUI.

Duration: April 2013 - April 2015.

Coordinator: Data Publica

Others partners: Inria, Orange, EDF, LaPoste, Hurance, Cinequant, IMT.

See also: http://www.xdata.fr/.

Abstract: The X-data project is a “projet investissements d’avenir” on big data with Data Publica (leader), Orange, La Poste, EDF, Cinequant, Hurence and Inria (Indes, Privatics and Zenith) . The goal of the project is to develop a big data plaftform with various tools and services to integrate open data and partners’s private data for analyzing the location, density and consuming of individuals and organizations in terms of energy and services. In this project, the Zenith team leads the workpackage on data protection and anonymization.

6.1.2. IPSec with pre-shared key for MISTIC security

Title: IPSec with pre-shared key for MISTIC security.

Type: CIFRE.

Duration: Juillet 2014 - Juillet 2017.

Coordinator: Inria

Others partners: Privatics, Moais and Incas-ITSec.

PROSECCO Project-Team (section vide)