Achievements
1.1. FORMAL METHODS

1.1.1 Formal methods

### Members

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- PhDs defended: 21
- On-going PhDs: 9
- Post-doctoral fellowships: 120 months

**Staff (on 2014/06/30):**
- BAUDERON Michel (PR), BILLAUD Michel (MCF), CARRERE Fréderique (MCF), CASTERAN Pierre (MCF), CLEMENT Lionel (MCF), COURCELLE Bruno (PR émérite), DICKY Anne (MCF), DURAND Irène (MCF HDR), FELIX Patrick (MCF), FLEURY Emmanuel (MCF), GAUWIN Olivier (MCF), GIMBERT Hugo (CR), GLOESS Paul (PR), GRIFFAULT Alain (MCF), HERBRETEAU Frédéric (MCF), JANIN David (MCF HDR), LAPOIRE Denis (MCF), LEROUX Jerome (CR HDR), LOMBARDY Sylvain (PR), LY Olivier (MCF HDR), MOOT Richard (CR), MOSBAH Mohamed (PR), MUSCHOLL Anca (PR, team leader), MUSUMBU Kaninda (MCF), PLACE Thomas (MCF), PUPPIS Gabriele (CR), RENAULT David (MCF), RETORE Christian (PR, leader of axis “Logic and linguistics in computer science”), ROLLET Antoine (MCF), SALVATI Sylvain (CR), SENIZERGUES Gérard (PR), SIMON Laurent (PR), SUTRE Grégoire (CR), VINCENT Aymeric (MCF), WALUKIEWICZ Igor (DR, leader of axis “Logic, languages and graphs”), WEIL Pascal (DR), ZEITOUN Marc (PR, leader of axis “Modeling and verification”)

Members of our team fulfill various administrative tasks at the level of LaBRI, the University of Bordeaux and IPB Enseirb-Matmeca. Among the main tasks: director of LaBRI (P. Weil), adjoint director of LaBRI (M. Mosbah) and head of “licence informatique” (M. Zeitoun).

**Postdoctoral researchers (2009/01/01-2014/06/30):**

**PhD students (on 2014/06/30):**
- BINDEL Sébastien, DUBOURG Etienne, HALFTERMEYER Pierre, KELMENDI Edon, KIRMAN Jérôme, PASSAULT Grégoire, ROUXEL Quentin, SIVILVESTRE Marc, TRAN Thanh Tung, VAN ROOIJEN Lorijn.

1.1.2 Scientific report

The “Formal Methods” team has a large spectrum of scientific interests, with strong and internationally-renowned expertise in automata and logic, language theory and grammars, graph decompositions, non-commutative algebras, distributed systems, infinite systems, extended logics and automata with data, weights, time, or probabilities. The focus of our research is on fundamental contributions in research areas with significant potential for applications.

Till June 2014 the team consisted of three research axes “Logic, graphs and languages”, “Modeling and verification”, and “Logic and linguistics in computer science”. Taking into account the physical and thematical mobility of its members, since June 2014 the activities of the third axis have integrated the other two ones. This results in a team organized around two research axes of roughly the same size (ca. 20 permanent researchers). These two axes have each a weekly seminar, where talks of high quality are presented on a regular basis. A new seminar around the proof assistant Coq was launched in the academic year 2013/14. The team also hosts the project Rhoban, that designs autonomous legged robots, especially humanoid robots, and robots applied to precision farming. We are also involved in the transverse project VISIDIA/Dampas (jointly with CombiAlgo), that develops an environment for modeling and proving distributed algorithms.

The text below gives a synthetic presentation of selected results obtained by our team in the period of reference. This presentation aims to show the impact of the results as well as the diversity of research interests of the team. This diversity has a common thread that consists in studying finite and infinite, discrete objects from a logical viewpoint, and manipulating them algorithmically. The common culture in our team is attested by joint publications, but also by the fact that the two main seminars of the team often attract members of all axes.
Axis “Logic, graphs and languages”

Logic and graphs. Combining the description of graph properties by MSO formulas and graph decompositions is fruitful in two different domains: (1) the theory of graph grammars and graph transductions and (2) the construction of fixed-parameter tractable algorithms for checking MSO graph properties.

The book authored by B. Courcelle and J. Engelfriet [O11] develops both aspects mentioned above at a fundamental level. In particular, tree- and clique-decompositions of graphs are formulated algebraically, leading to a presentation of context-free graph grammars as equation systems and to an algebraic view of the translation of MSO formulas into finite automata.

On the algorithmic side our team develops realistic model-checking applications for large graphs [R135, C180], based on the notion of fly-automaton. States and transitions of fly-automata are represented implicitly by meta rules, instead of explicit listings in huge tables. Only those states and transitions are computed that are required when running over a particular term describing the input graph. Some NP-complete problems, such as coloring problems, can be solved in this way on relatively large graphs (> 1000 vertices). Besides their practical interest in model-checking, fly-automata can provide also a quantitative information, like computing the number of 3-colorings of a given graph. This opens further perspectives for using fly-automata for enumeration, optimization and counting problems. Another topic of future study are good heuristics for computing graph decompositions. Reducing this problem to SAT offers interesting practical perspectives that can exploit recent competences in SAT solving in the axis “Modeling and Verification”.

Logic and algebra. Deep insights into logical formalisms are obtained by studying limits of their expressivity. Algebra provides powerful methods for answering this type of problems. Historically it has been first applied to formalisms over words, but it has been extended to trees and other types of models.

Recently, our team has obtained an important breakthrough in one of the most classical problems of this area, open since the late nineties. The problem is to provide an effective characterization of classes of word languages defined by quantifier alternation of first-order logic. We have shown such a characterization for the levels up to $\Sigma_3$, [C1214]. The new insight that allowed us this advance was to consider a more general, yet effective problem, called separation problem. Indeed the separation problem serves as an intermediate step between the levels of the hierarchy. In the future we aim at identifying relevant generalizations of separation, in order to solve them and to obtain decidability for other fragments, ideally for the full quantifier alternation hierarchy.

The algebraic viewpoint has been shown to be very fruitful in investigating several other logical and automata settings, as the following examples illustrate. A decidable characterization of the quantifier-alternation hierarchy within two-variable first-order logic $\text{FO}^2$ was obtained by means of a lattice of subvarieties of the variety $\text{DA}$ [C150], which characterizes the logic $\text{FO}^2$. For tree languages, the concept of forest algebras was introduced and its basic theory was developed in [R120], providing characterizations of many interesting tree logics. Forest algebras offer currently the most advanced general notion of recognizability for tree languages. Finally, the notion of recognizability has been developed for languages of labeled, bi-rooted trees in [C135], through the theory of inverse monoids.

Data formalisms. Data formalisms were originally motivated by applications in XML processing [R119], and more recently by various settings that require an explicit reasoning about object identities (“nominals”), like parametric verification or analysis of programs with object creation. The need of reasoning effectively on properties of objects with data poses new challenges, such as designing regular-like formalisms that are expressive, robust and algorithmically effective.

Various natural settings that handle data were investigated by our team. MSO with rigidly-guarded data tests was shown to be a robust logic for data words, as it corresponds to recognizability by orbit-finite data monoids [C178]. Data-walking automata over data words were shown to enjoy good algorithmic properties, in particular, both emptiness and inclusion are decidable for this model. We also settled the relationship between deterministic, non-deterministic data-walking automata, and data automata, which is the model that captures two-variable logic over data words [R115]. A further problem that we considered is containment for several fragments of Datalog over data trees [C10], showing in particular decidability of containment for unranked data trees of bounded depth.

The medium term goals in this area are numerous. One of the main focus will be on two-way and unambiguous register automata, hoping that the basic requirements of expressivity, robustness and algorithmic
1.1. FORMAL METHODS

effectiveness can be achieved.

Higher-order programs. We have worked on the analysis of higher-order functional programs using as an abstract syntax the $\lambda Y$-calculus, that offers an attractive alternative to variants of pushdown automata, or to that of recursive schemes. As the first witness of usefulness of this approach we have shown in [CI228] that an abstract machine for performing beta-reduction, called Krivine machine, is more suitable for model-checking higher-order programs than machines based on higher-order pushdown automata used before in this context. Next, this approach has allowed us to generalize Muchnik’s theorem, that is a powerful tool for proving decidability of theories [CI229]. Finally, we have shown that suitable variants of models for the lambda calculus offer an even more versatile approach than Krivine machines [CI230], although at present this technique is limited to properties expressed in weak monadic second-order logic.

In the short/medium term perspective we will concentrate on two directions: (1) extending the model based approach to bigger logical fragments, and (2) using the semantic approach to improve the algorithmics of higher-order model checking. The first direction opens very interesting perspectives of interactions between the semantics and the language theory communities. It may lead to a new theory encompassing the algebraic theory of regular languages, and extending it to finite and infinite trees. The second direction has already given us novel type systems for the model-checking problem, and many other promising aspects are waiting to be explored.

Weighted automata. Weighted automata were introduced in the sixties as a way to extend the expressivity of finite automata. More recently, they appear to be a cornerstone of the analysis of quantitative models. We studied the general framework of weighted automata on various semirings (usual numbers, min-plus, transducers,...) When $\varepsilon$-transitions are allowed, the number of computations on a given input are infinite and therefore the definition of the behaviour of such an automaton requires stronger assumptions. We defined it in the framework of topological semirings [RI71], and showed in many cases that it is decidable whether the behaviour of such a weighted automaton is well-defined. Our approach could be applied to other weighted models. We also worked on weighted two-way automata; we proved in [CI64] that, if the semiring of weights is commutative, unambiguous weighted two-way automata can be emulated by unambiguous weighted one-way automata; we also showed that unambiguous weighted one-way automata can be emulated by deterministic two-way automata.

From a different perspective and motivated by verification questions, we obtained Kleene-Büchi theorems in the quantitative setting, by proving that a first-order calculus is expressively equivalent to 2-way walking pebble automata. This was done both for words [CI44, RI21] and for abstract classes of graphs with reasonable properties [CI239], including trees, nested words, Mazurkiewicz traces and grids.

Axis “Modeling and verification”

Infinite-state systems. The reachability problem for Petri nets is an important research subject. Practical algorithms for this famous problem, that was solved by E. Mayr and R. Kosaraju in the mid eighties, remain a big challenge and would be extremely useful in many areas of program verification. We are working towards a deeper understanding of the reachability problem, that may allow to progress on the algorithmic side and open the venue for practical algorithms. We presented a new and simple algorithm for the reachability problem [CI156, CI157], based on the existence of inductive Presburger invariants for expressing non-reachability.

Semilinear Petri nets are nets where the reachability set is definable in Presburger arithmetics. They are a very useful class of nets, since non-reachability witnesses are Presburger definable. We gave in [CI151] an effective procedure based on acceleration for computing a Presburger formula describing the reachability set of semilinear nets. In particular, our tool \textsc{Fast}, that implements acceleration methods, is able to compute the reachability sets of semilinear nets.

Petri nets with an additional stack form a very interesting class of infinite-state systems: they are very expressive, and still it is conjectured that they can be analyzed algorithmically. For example, this extension of Petri nets can directly model parametrized server-client systems where the server may use recursion and the clients are finite-state. The main verification question, namely reachability, is open for this model for more than 15 years and is very challenging. We progressed recently on two other important questions about
this model, by showing that termination and boundedness are decidable [CI241]. As a short/medium term goal we will consider the complexity of these two problems.

**Distributed systems.** There are still very challenging fundamental problems in this area, even for finite-state distributed systems. One such problem is to control one distributed system by another. We showed that the control problem for rendez-vous communication is decidable when the synchronization graph is acyclic, and that the complexity is non-elementary complete, even for reachability conditions [CI112]. This result comes as a surprise, since distributed control becomes undecidable in related models, e.g. the synchronous model of Pnueli and Rosner.

Synthesis of a finite distributed system from a specification is another topic where we progressed significantly. For general asynchronous automata we presented an optimal, exponential construction of asynchronous automata from deterministic finite automata [CI111]. In the case of acyclic synchronization graphs we obtained a simple, quadratic construction for asynchronous automata [R164]. As a medium term perspective we will investigate the synthesis problem for bounded communicating automata with acyclic communication graphs, along the lines of the previous construction.

We have also worked on richer models of communication as the one with unbounded communication channels. We have characterized precisely architectures with decidable reachability problem in [R159], and provided an analogous result for communicating, real-time systems in [CI71].

**Probabilistic automata.** Probabilistic automata are a natural extension of deterministic automata on finite words with randomized events. These automata are very expressive, but from an algorithmic point of view they are intractable: many natural decision problems (e.g., emptiness, universality, rationality, isolation) are undecidable.

The undecidability results have also consequences on the control of systems with partial observation. Indeed, when the observation is only partial, the best controllers are often randomized, for example Ethernet controllers use random delays to recover connectivity after a packet collision. As a consequence, the computation of optimal controllers reduces to undecidable questions about probabilistic automata.

Our team focused its research on a particular problem about probabilistic automata, called the value 1 problem: are there words accepted by the given automaton with acceptance probability arbitrarily close to 1? This question was open since the sixties, and we solved it negatively, showing that the problem is undecidable [CI115]. On the positive side, we designed a class of automata for which the value 1 problem is decidable [CI98], using algebraic techniques developed by Leung and Simon. We have extended the decidability results to one player stochastic games [CI116] and numerous variants of the value 1 problem [CI97].

**Real-time systems.** Timed automata are finite automata extended with clocks whose values can be compared with constants and can be set to zero during transitions. The reachability problem asks if there is an execution of a given automaton reaching a given state. This is the core algorithmic problem in the analysis of timed automata for which a relatively efficient solution exists, thanks to abstraction methods allowing to deal with continuous values symbolically. We have managed to show that non-convex abstractions can be used efficiently for the reachability problem [CI121, CI126]. Moreover, we have shown that one of the abstractions we have studied is in some precise sense the coarsest correct abstraction possible [CI125].

The improvements described above, together with new symbolic representations, make the real-time aspect so manageable that the discrete state part becomes the dominant complexity factor in real-time reachability-checking algorithms. We think that the most promising direction to get the next order of magnitude improvement in efficiency will be to introduce partial-order methods to real-time verification. The other problem we want to tackle is verification of Büchi conditions for timed systems. Despite the fact that timed systems have been studied for about 20 years, there is not much progress in these two natural directions, and indeed there are some fundamental difficulties that need to be overcome.

**Tools.** The most mature tools developed in our team are the verification tool for finite-state systems AltaRica and the SAT solver Glucose.

The modeling language AltaRica has been designed at LaBRI at the end of the nineties. The language and an associated suite of tools became gradually well-known in the aerospace industry. A variant of the language is used in commercial tool OCAS developed by Dassault. It is also an input language of the tool SIMFIA of EADS. In the period of reference we worked on a new kind of analysis, failure diagnosis. This
work was supported by a contract with Thales Avionics Toulouse and a CIFRE PhD thesis, and has been implemented in the ARC tool [CI151].

The award winning SAT solver Glucose was co-designed by L. Simon, recruited in September 2013 as a professor at IPB. During the first months at the LaBRI, the work on Glucose continued by studying modern SAT solver performances [CI202], and the parallelization of Glucose [CI22].

In addition to the core SAT research, new applications of SAT solvers for model checking and verification will be targeted. The main idea will be to mix the BDD approaches used in Altarica with the use of incremental SAT solving technologies. This could allow to solve larger problems by balancing the effort between CPU-intensive (SAT oracles) and memory-intensive (BDD) demands.

A couple of further important software projects of our team can be mentioned. The following list is by no means exhaustive, it is meant to illustrate the diversity of our projects. TChecker is a new tool that implements the abstraction techniques for timed systems mentioned above and is freely available since 2014. A comparison between TChecker and the reference tool Uppaal showed better performance of TChecker on several Uppaal benchmarks. LALBLC is a prototype tool checking the equivalence of two deterministic pushdown automata, [CI120]. It has been already employed in the verification of cryptographic protocols by researchers at LORIA. The Vaucanson platform [CI86] is a C++ library dedicated to the computation with weighted automata, where the semiring of weights can be parametrized by the user.

**Axis “Logic and linguistics in computer science”**

The group on logic and linguistics, by now dissolved, was focusing on several aspects of natural language, namely syntax and semantics. The mathematical models we use are logic, type theory, lambda calculus and formal grammars, and the convergence of the last two concepts is known as abstract categorial grammars.

The study of grammar formalisms underlying natural language syntax is of primary interest in our group. We have successfully applied algorithms for solving Datalog queries to the parsing of formal languages [CI43], in particular for the ones that correspond to human languages, namely mildly context sensitive languages. This latter class of languages has also been studied in connection with simply typed lambda calculus through Abstract Categorial Grammars, and through First Order Linear Logic [CI187, AI43].

Obtaining better approximations of human language by formal languages is one of the basic research threads of language theory since its beginnings. The language MIX is a completely “unstructured” language, and is a standard example of a language that should not belong to a reasonable class of languages intended to model human languages. Contradicting common beliefs we proved in [RI86] that MIX falls into the class of Multiple Context-Free Languages. This class was widely believed to be the class of formal languages approximating most adequately human languages. Interestingly, the proof requires some exotic tools pertaining to algebraic topology.

The group pursued its work on categorial grammars, that represent a natural interface between syntax and semantics — they can also recover some aspects of the Chomskyan syntax [RI7]. The textbook [OI3] gathers classical results about categorial grammars, as well as the linear logic view that was developed by our group. Different ways of semi-automatically extracting categorial grammars from annotated treebanks have been investigated: a classical grammar extraction method [CI17, CI185], as well as a novel approach using tree transducers [CI231]. The extracted grammars have been used for a wide-coverage parsing of French text. What makes this wide-coverage parser interesting is that it produces a logical representation of the meaning of the sentence it has analyzed [CI186, RI74].

We introduced the semantic framework named the Montagovian generative lexicon (MGL) [RH10, AN7] which is a way to include lexical meaning into compositional semantics, computing the logical formulas associated with a sentence. The MGL uses second-order typed lambda calculus (system F) enriched with coercive subtyping [CI224] and the formulas that represent meaning are higher-order many-sorted formulas. We defined and used this framework to model the adaptation of word meaning to the context of utterance, and to give a proper account of lexical semantics and pragmatics: meaning transfers, possible and impossible predications and copredications, [RH10, AN7, CI224] fictive motion and deverbals [CI189, CI220]. The group has also shown its relevance for classical issues in compositional semantics, like verbal tense [CI155], plural noun phrases [CI178], quantifiers and determiners (with typed Hilbert operators) [RI81, II15, CI222].

On the practical and empirical side of computational linguistics, our group continued to develop the categorial parser Grail [CI186, RI74] and the Lexical-Functional Grammar parser XLFG.
1.1.3 Scientific production

Our research activities have a broad spectrum and are attested by publications of high quality in the best conferences in our domains: ICALP (International Colloquium on Automata, Languages and Programming), LICS (Symposium on Logic in Computer Science), STACS (International Symposium on Theoretical Aspects of Computer Science), CAV (Computer Aided Verification), CONCUR (Concurrency Theory), FSTTCS (Foundations of Software Technology and Theoretical Computer Science), POPL (Symposium on Principles of Programming Languages), TACAS (Tools and Algorithms for the Construction and Analysis of Systems), as well as journals of high reputation: Information and Computation, Logical Methods in Computer Science, Theoretical Computer Science, etc. Members of the group have co-authored two textbooks: *Graph structure and monadic second-order logic, a language theoretic approach* (B. Courcelle and J. Engelfriet, Cambridge University Press 2012) and *The logic of categorial grammars: a deductive account of natural language syntax and semantics* (R. Moot and C. Réteré, Springer 2012). The team is currently developing 11 software tools.

We chose in the list below 10 publications of the team showing the broad thematical focus.


   The model-checking problem for monadic second-order logic on graphs is fixed-parameter tractable with respect to tree-width and clique-width. The proof constructs finite automata from monadic second-order sentences. These automata recognize the terms over fixed finite signatures that define graphs satisfying the given sentences. However, this construction produces automata of hyper-exponential sizes, and is thus impossible to use them in practice. To overcome this difficulty, we propose to use fly-automata, where transitions are described by programs instead of tables. Using fly-automata, we can check effectively certain monadic second-order graph properties with limited quantifier alternation depth, that are nevertheless interesting for Graph Theory. We give explicit constructions of automata relative to graphs of bounded clique-width, and we report on experiments.


   This paper addresses the following definability problem: given a function defined by a two-way finite state transducer, is it definable by a one-way finite state transducer? By extending Rabin and Scott’s proof from finite automata to transducers, we show that this problem is decidable. Our procedure builds a one-way transducer, which is equivalent to the two-way transducer, whenever one exists.


   This paper considers algorithmic problems for probabilistic automata on finite words. Among these problems, the decidability of the value 1 problem was an open question since decades. We show that the value 1 problem is undecidable. Moreover, we introduce a new class of probabilistic automata, #-acyclic automata, for which the value 1 problem is shown to be decidable.


   A standard solution to the reachability problem for timed automata involves computing a search tree whose nodes are abstractions of zones. These abstractions preserve underlying simulation relations on the state space of the automaton. For both effectiveness and efficiency reasons, they are parametrized by the maximal lower and upper bounds (LU-bounds) occurring in the guards of the automaton. We consider an abstraction defined by Behrmann et al. Since this abstraction can potentially yield non-convex sets, it has not been used in implementations. We prove that this abstraction is the biggest abstraction with respect to LU-bounds that is sound and complete for reachability. We also provide an efficient technique to use it to solve the reachability problem.

The reachability problem for Vector Addition Systems (VASs) is a central problem of net theory. The general problem is known to be decidable by algorithms exclusively based on the classical Kosaraju-Lambert-Mayr-Sacerdot-Tenney decomposition (KLMTS decomposition). Recently from this decomposition, we deduced that a final configuration is not reachable from an initial one if and only if there exists a Presburger inductive invariant that contains the initial configuration but not the final one. Since we can decide if a Presburger formula denotes an inductive invariant, we deduce from this result that there exist checkable certificates of non-reachability in the Presburger arithmetic. In particular, there exists a simple algorithm for deciding the general VAS reachability problem based on two semi-algorithms. A first one that tries to prove the reachability by enumerating finite sequences of actions and a second one that tries to prove the non-reachability by enumerating Presburger formulas. In this paper we provide the first proof of the VAS reachability problem that is not based on the KLMST decomposition. The proof is based on the notion of production relations, inspired from Hauschildt, that directly proves the existence of Presburger inductive invariants.


This paper shows that satisfiability for the two-variable fragment of first-order logic with data equality test, is decidable over finite and over infinite data words. The satisfiability problem is shown to be at least as hard as reachability in Petri nets. Several extensions of the logic are considered, some remain decidable while some are undecidable.


This paper investigates the quantifier alternation hierarchy in first-order logic on finite words. Levels in this hierarchy are defined by counting the number of quantifier alternations in formulas. We prove that one can decide membership of a regular language to the levels $B\Sigma_2$ (boolean combination of formulas having only 1 alternation) and $\Sigma_3$ (formulas having only 2 alternations beginning with an existential block). Our proof works by considering a deeper problem, called separation, which, once solved for lower levels, allows us to solve membership for higher levels.

8. **S. Salvati.** MIX is a 2-MCFL and the word problem in $\mathbb{Z}_2$ is solved by a third-order collapsible pushdown automaton. *Journal of Computer and System Sciences*, to appear 2014.

The language MIX is a completely “unstructured” language, and is a standard example of a language that should not belong to a reasonable class of languages intended to model human languages. We show here that MIX falls into the class of Multiple Context-Free Languages. This class was widely believed to be the class of formal languages approaching most adequately human languages.


We use the recently developed theory of forest algebras to find algebraic characterizations of the languages of unranked trees and forests definable in various logics. These include the temporal logics CTL and EF, and first-order logic over the ancestor relation. While the characterizations are in general non-effective, we are able to use them to formulate necessary conditions for definability and provide new proofs that a number of languages are not definable in these logics.


We consider the two-variable fragment $FO^2[\cdot]$ of first-order logic over finite words. Restricting the number of quantifier alternations yields an infinite hierarchy. We show that each level of this hierarchy is decidable. For
this purpose, we relate each level of the hierarchy with a decidable variety of finite monoids. Our result implies that there are many different ways of climbing up the $\text{FO}^2[\prec]$-quantifier alternation hierarchy: deterministic and co-deterministic products, Mal’cev products with definite and reverse definite semigroups, iterated block products with J-trivial monoids, and some inductively defined omega-term identities. A combinatorial tool in the process of ascension is that of condensed rankers, a refinement of the rankers of Weis and Immerman and the turtle programs of Schwentick, Thérien, and Vollmer.

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1.1.4 Visibility and attractivity

The quality and impact of the results obtained in our team is attested by a large number of invited lectures at conferences that are references in our domain ($\text{CONCUR, FST&TCS, MFCS, ...}$) and of tutorials at international PhD schools (cf. list in the appendix$^1$). The following national and international awards have honored several members of our team:

- ACM Software System Award 2013 for the Coq proof assistant (P. Castéran)
- Best paper award at the Alan Turing centenary conference Turing’100, June 2012 (J. Leroux)
- Silver medal CNRS 2010 (A. Muscholl)

A strong indicator for the attractivity of our team is the appointment of two full professors (S. Lombardy 2012 and L. Simon 2013), two assistant professors (O. Gauwin 2011 and Th. Place 2012), one CNRS CR1 researcher (G. Puppis 2012) and one CNRS CR2 researcher (D. Figuiera 2014).

Editorial and organizational activities

Involvement in organization and evaluation of scientific activity has been very considerable. Members of our team are active in numerous editorial boards, among which there are prestigious journals like $\text{Logical Methods in Computer Science, Information and Computation}$ and $\text{Theoretical Informatics and Applications}$.

Our team is represented on a regular basis in program committees of the main conferences in our domains ($\text{ICALP, LICS, STACS, ETAPS, ...}$) and has chaired program committees of high-quality conferences like $\text{ESLII’09 and FoSSaCS’14}$. Several members are active in steering committees of first-rate conferences like $\text{STACS}$ (International Symposium on Theoretical Aspects of Computer Science), $\text{FoSSaCS}$ (International Conference on Foundations of Software Science and Computation Structures) and $\text{ICGT}$ (International Conference on Graph Transformation). Involvement in networking activities is strong, in national organizations like $\text{GDR “Informatique-Mathématique”}$ and $\text{“Génie de la Programmation et du Logiciel”}$, and international organizations (IFIP WG2.2 Formal description of programming concepts).

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$^1$The invited talks in the table account only for talks with a contributed paper in the proceedings.
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</thead>
<tbody>
<tr>
<td>Steering committee</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>Program committee</td>
<td>5</td>
<td>66</td>
</tr>
<tr>
<td>Presidency of program committee</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organizing committee (conferences, seminars, schools...)</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Presidency of organizing committee</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Journal editorial board</td>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td>Research animation</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Service as expert or evaluator

Members of the team served in hiring committees of several French universities, such as U. Aix-en-Provence, U. Marne-la-Vallée (Paris-Est), U. Paris Diderot (Paris 7), U. Paris 13, U. de Lorraine, U. Paul Sabatier Toulouse. They acted as members of AERES evaluation committees of laboratories such as IBISC, LIP6, LIX and LORIA, and belong to the Conseil national des universités (CNU, 2011-2015) and Conseil scientifique INSII (2010-2014, president). They served as reviewers for research agencies of various countries (Austria, Canada, Germany, Israel, Netherlands, Switzerland, USA) and for international PhD and habilitations (Czech Rep., Germany, India, and Poland). They are members of international prize juries for the EATCS Fellowship Committee and the Witold Lipski Prize.

<table>
<thead>
<tr>
<th>Service as expert or evaluator</th>
<th>national</th>
<th>international</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chair of expert committee</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Membership in expert committee</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Individual expert (reviewer)</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>Chair of selection board</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Membership in selection board</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Membership in prize jury</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Reviewing of PhD or habilitation</td>
<td>26</td>
<td>8</td>
</tr>
<tr>
<td>Membership of PhD/habilitation committee</td>
<td>37</td>
<td>6</td>
</tr>
</tbody>
</table>

Scientific collaborations

Our team is involved in a large number of national and international cooperations. Locally, there are traditionally strong links with the team “CombiAlgo” attested, among others, by the VISIDIA/Dampas project. Several members of our team collaborate actively with many first-rate laboratories in France. In particular, 10 ANR projects started since the beginning of the evaluation period. The team has coordinated several bilateral projects and has a longstanding collaboration with Indian IITs and other research institutes, attested in particular by the INdo-French FORmal MEthods Lab (LIA Informel) and the Franco-Indian ICST project AVeRTS (2014-2018).

<table>
<thead>
<tr>
<th>Scientific collaborations</th>
<th>national</th>
<th>international</th>
</tr>
</thead>
<tbody>
<tr>
<td>Projects</td>
<td>14</td>
<td>7</td>
</tr>
<tr>
<td>Joint publications</td>
<td>30</td>
<td>39</td>
</tr>
<tr>
<td>Other collaborations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Research visitors</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Research visits</td>
<td>22</td>
<td></td>
</tr>
</tbody>
</table>
1.1.5 Involvement with social, economic and cultural actors

Collaborations with the industry

Collaboration with industrial partners is organized via ANR projects as well as through direct contracts. The *AltaRica* project offers a modeling language and a set of tools, well-known in the aero-space industry. In the period of reference *AltaRica* had a contract with Thales Avionics Toulouse and a CIFRE PhD on diagnosis of avionic systems. Three other CIFRE PhD thesis with SERMA, EADS and 2Moro were supervised in our team within the project *VISIDIA/Dampas*. The project *Rhoban* collaborates with VITIROVER SAS, France within the EU project VVINNER (Vineyard Vigilant & INNovative Ecological Rover, 2012-2015). The start-up *Rhoban System S.A.S* was created in 2012.

<table>
<thead>
<tr>
<th>Collaborations with the industry</th>
<th>total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial contracts</td>
<td>2</td>
</tr>
<tr>
<td>Contributions to professional journals and overview publications</td>
<td></td>
</tr>
<tr>
<td>Reports for decision makers</td>
<td></td>
</tr>
<tr>
<td>Contributions to standards</td>
<td></td>
</tr>
<tr>
<td>Collaborations outside of universities</td>
<td>2</td>
</tr>
<tr>
<td>Start-ups</td>
<td>1</td>
</tr>
</tbody>
</table>

General audience actions

Involvement with social and cultural actors is attested by a wide spectrum of activities in the period of reference: participations at “Maths en jeans” and “Fête de la science”, presentations at general audience exhibitions at Cap Science (Bordeaux, 2009), "Mathématiques, un dépaysement soudain" (Fondation Cartier, Paris, 2011) and the International exhibition EXPO 2012 (Yeosu, Korea 2012, French pavillon), participation at the international competition Robocup 2014 (Bresil). A Summer School around the Coq Proof Assistant takes place in Shonan, Japan, August 2014.

<table>
<thead>
<tr>
<th>General audience actions</th>
<th>national</th>
<th>international</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learned society, federation</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Scientific popularization, dissemination of scientific culture</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Publications for large audience</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>
Scientific strategy and prospects for the next contract
2.1 Formal Methods

2.1.1 Scientific project

The main research guideline of the “Formal Methods” team consists in developing mathematical concepts and methods that help to understand and analyze computer-generated data, or the behaviour of computer systems. All our objectives pertain to foundational work with a clear application in methodologies for the design of reliable systems and applications. With the rapid increase of complexity of data and systems, due to networking, massive parallelism, cloud computing, or big data, problems such as data consistency, deadlock avoidance, and fault tolerance become critical and very challenging issues. Automatic error detection for such systems and support for fault tolerance are essential even for non-critical applications, due to performance requirements and highly complex behaviors.

One of the main strengths of our team is the internationally renowned expertise in developing solid foundations for analyzing such systems. During the reference period, our team has contributed several deep results, that open numerous important directions for future research. The team has also a large spectrum of competences rooted in the common scientific culture. This combination is a solid basis for high-quality research addressing the new challenges in our field.

2.1.2 Self-assessment

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Large spectrum of competences and common</td>
<td>- Difficulties in attracting sufficiently well-skilled master and PhD students.</td>
</tr>
<tr>
<td>scientific culture.</td>
<td></td>
</tr>
<tr>
<td>- High visibility and impact.</td>
<td>- Several tools are developed in small groups, their visibility does not correspond to the intrinsic quality.</td>
</tr>
<tr>
<td>- High-quality recruitments, and successful integration of new members.</td>
<td></td>
</tr>
<tr>
<td>- Several dynamic young members in the team.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Opportunities</th>
<th>Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Research environment: LaBRI and the Talence campus (Labex CPU, INRIA).</td>
<td>- Few funding sources for long-term, foundational research may force us to orient some of the activities towards many small short-term objectives that can weaken the scientific coherence of the team.</td>
</tr>
<tr>
<td>- Collaborations with industry via former PhD students.</td>
<td></td>
</tr>
<tr>
<td>- Numerous international research collaborations of high quality.</td>
<td></td>
</tr>
</tbody>
</table>

2.1.3 Scientific strategy

In the future we plan to build on the present dynamics in the team, developing research directions that belong to our long term scientific objectives, and also new research directions that are strengthened by the recent appointments in the team. The recent recruitments of the axis “Logic, graphs and languages” are very important in increasing its dynamics and compensating to some extent the retirement of B. Courcelle and some future departures/retirements (Ch. Rétoré, P. Castéran). For the axis “Modeling and verification” the team has acquired excellent complementary competence in SAT solvers, that can become of great value for our software projects.

The ability to achieve our research objectives is enhanced by the numerous, high-quality international collaborations that we developed over the years. International collaborations will remain a high priority for our team and one of the general goals for the next period is to increase our participation in European networks. We are actively considering European H2020 calls, among others ICT projects (ICT 2014 - Information and Communications Technologies) and networking programs (COST, European Cooperation in Science and Technology, and international GDR), and responded to some of them. Furthermore, through
even tighter collaboration with foreign universities, e.g. with Indian or European research institutes we hope to attract more highly-skilled PhD students.

Another very positive factor is the environment of our team: LaBRI, INRIA, and Labex CPU. The team contributes to, but also benefits from the high visibility of LaBRI and the expertise of other teams. Interactions with other teams, like “Combinatorics and algorithms”, are developed continuously (Dampas project). More recent interactions with the “Image & sound” team are opportunities for emerging activities and might lead to a tighter connection with INRIA. The CPU cluster offers a rich multidisciplinary environment that will be exploited more fruitfully in the future.

We present next some concrete research objectives for the next reference period, where a large part of the scientific interests of the team converge.

“Logic, graphs and languages” Regularity is a cornerstone concept in computer science. It is a very robust concept that can be studied from many different perspectives, like logic, automata and algebra. These notions have played, once again, a very important role recently, in advancing our understanding of logical expressiveness. The progress achieved by our team on decidable characterizations of the quantifier hierarchy of first-order logic shows that this interplay has still a big potential to attack successfully longstanding open questions in logic. The triangle “logic, automata and algebra” also offers an interesting perspective in the study of data formalisms, where we reason explicitly about object identities (“nominals”) from an unbounded domain. Here, our challenge will be to identify robust and expressive regular-like data formalisms and apply them to the verification of programs with parametrization or with linked data. A further domain where regularity plays a central role is the setting where data streams are processed by transducers. Our challenge is to contribute to the foundations of two-way transducers and transducers with data. It is important to note that all these research topics are new and owe to a large extent their dynamics to newly appointed members of the team.

“Modeling and verification” Counter systems occur naturally in many verification settings, like parametrized systems, systems with dynamic object creation or systems with unbounded data as identifiers or integers. Whereas the verification of finite-state systems is nowadays very mature, many basic challenges remain in the analysis of counter systems. Proposing new methods for the analysis of such systems that are suited for practical use, is an important topic. So far, our team developed verification tools for counter systems based on symbolic methods that yield a precise analysis of the reachable state spaces. In order to scale up these techniques to the verification of large counter systems, we intend to explore new verification methods based on less accurate analysis and heuristics. From this perspective, our research in the next reference period will be oriented towards the development of algorithmic methods for manipulating efficiently large state spaces with parametrized degree of accuracy.

More generally, formal verification tools and methods have been constantly evolving, facing more and more complex systems to certify. In the last years, the direct or indirect use of SAT solvers (by unrolling time steps or using incremental SAT solving tools) allowed to scale up the size and complexity of certified systems. The AltaRica modeling and model-checking tool uses currently memory-intensive BDDs as symbolic representation of state spaces. We plan to explore the potential of SAT solvers for the analysis of AltaRica models. For this we can employ in-house know-how thanks to the recent recruitment of the co-author of the award winning SAT solver Glucose. The plan is to use a SAT solver as oracles during recursive calls of BDD constructions. Such calls will be used e.g. to remove irrelevant variables from BDDs or to influence the order of the variables. Potentially such optimizations may lead to substantial scale up of the existing technology.

In addition, the work on parallelization of the SAT solver Glucose will be pursued actively. Proposing an efficient framework for CDCL parallelization is still an important challenge for the whole SAT community, as it will allow to explore the potential current multi-core and multiprocessor machines.
Appendices
List of research products and achievements
A.1 (Sera le nom de votre équipe)

A.1.1 Scientific production

Publications

Peer-reviewed journals (international)


**Peer-reviewed journals (national)**


**Collected works (international)**


Chapters in collected works (international)


Chapters in collected works (national)


Editors of collected works (international)


Editors of collected works (national)


Invited talks (international)


Conferences with published proceedings (international)


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[CI240] T. Place and M. Zeitoun, Separating regular languages with first-order logic, in Joint meeting of the Twenty-Third EACSL Annual Conference on Computer Science Logic (CSL) and the Twenty-Ninth Annual ACM/IEEE Symposium on Logic in Computer Science (LICS), CSL-LICS 2014.


Conferences with published proceedings (national)


Conferences without published proceedings (international)


Conferences without published proceedings (national)


Other publications (international)


Other publications (national)


sSoft

Other software

- Insight, http://insight.labri.fr/trac
- Rhoban, http://rhoban.labri.fr/pub/
- Vaucanson, http://www.vaucanson-project.org/
- TaPAS/Faster, http://tapas.labri.fr/trac/wiki/FASTer
Completed PhDs

- Pierre Bourreau: Jeux de typage et analyse de lambda-grammaires non-contextuelles (2007-2012, CordiS, Ch. Retoré S. Salvati)
- Bruno Mery : Une modélisation de la sémantique lexicale dans le cadre de la théorie des types (2006-2011 Ch. Bassac, Ch. Retoré)

including cotutelle PhDs (international)


Completed habilitations

- Jérôme Leroux, Presburger Counter Machines, 2012
- Olivier Ly, Un parcours de recherche des méthodes formelles aux robots humanoïdes, 2012
A.1.2 Visibility and attractivity

Editorial and organizational activities

Steering committee (international)
- FICS (Fixpoints in Computer Science): I. Walukiewicz (2009- )
- Highlights of Logic, Games and Automata: H. Gimbert (2013 - )
- ICGT (International Conference on Graph Transformations): M. Mosbah (2009 - 2014)
- Logical Aspects of Computational Linguistics: Ch. Retoré (2011- )

Steering committee (national)

Program committee (international)
- ACL’10 (Association for Computational Linguistics): C. Retoré
- AFL’11 (Automata and Formal Languages): P. Weil
- AISS’14 (Algorithmics of Infinite State Systems), satellite workshop of CSL/LICS 2014: S. Salvati
- AMIL’10 Advances in Modal Logic: I. Walukiewicz
- ATVA’11 (12th International Symposium on Automated Verification): J. Leroux
- CAI 2013 (Algebraic Informatics): B. Courcelle
- CIAA’13 (18th International Conference on Implementation and Application of Automata): S. Lombardy
- CIAA’09 (14th International Conference on Implementation and Application of Automata): A. Muscholl
- CSLP’12 (International Workshop Constraint Solving and Language Processing): C. Retoré
- CSLP’12 (International Workshop on Constraint Solving and Language Processing): S. Salvati
- CSLP’14 (8th Constraint Solving and Language Processing): C. Retoré
- CSLP’14 (8th International Workshop on Constraint Solving and Language Processing): S. Salvati
- CSL/LICS’14 (Computer Science Logic/Symposium on Logic in Computer Science: I. Walukiewicz
- CSR’12 (International Computer Science Symposium in Russia): A. Muscholl
- CSR’11 (International Computer Science Symposium in Russia): I. Walukiewicz
- DLT’11 (Developments on Language Theory): A. Muscholl
- DLT’09 (Developments on Language Theory): G. Sénizergues
- FARM’14 (Workshop on Functional Art, Music, Modeling and Design): D. Janin
- FCT’09 (International Symposium on Fundamentals of Computation Theory): I. Walukiewicz
- FG’11 (Formal Grammar): C. Retoré
- FG’12 (Formal Grammar): C. Retoré
- FG’13 (Formal Grammar): C. Retoré
- FG’14 (Formal Grammar): C. Retoré
- FoSSaCS’11 (International Conference on Foundations of Software Science and Computation Structures): I. Walukiewicz
- FSTTCS’12 (IARCS Annual Conference on Foundations of Software Technology and Theoretical Computer Science): A. Muscholl
– FSTTCS’09 (IARCS Annual Conference on Foundations of Software Technology and Theoretical Computer Science): A. Muscholl
– GandALF’12 (3rd International Symposium on Games, Automata, Logics and Formal Verification): G. Puppis
– GandALF’12 (3rd International Symposium on Games, Automata, Logics and Formal Verification): A. Muscholl
– International Conference on Geometric, Combinatorial and Dynamic Aspects of Semigroup and Group Theory: P. Weil
– Highlights’14 (Highlights on Logic, Games and Automata): A. Muscholl
– Highlights’13 (Highlights on Logic, Games and Automata): A. Muscholl
– ICALP’12 (Int. Colloquium on Languages, Automata and Programming): I. Walukiewicz
– ICALP’11 (Int. Colloquium on Languages, Automata and Programming): A. Muscholl
– ICALP’09 (Int. Colloquium on Languages, Automata and Programming): A. Muscholl
– ICDT’12 (International Conference on Database Theory): A. Muscholl
– LACL’14 (8th International Conference on Logical Aspects of Computational Linguistics): C. Retoré
– LACL’14 (8th International Conference on Logical Aspects of Computational Linguistics): S. Salvati
– LACL’12 (7th International Conference on Logical Aspects of Computational Linguistics): S. Salvati
– LACL’12 (7th International Conference on Logical Aspects of Computational Linguistics): C. Retoré
– LATA’13 (7th International Conference on Language and Automata Theory and Applications): S. Lombardy
– LICS’13 (IEEE Symposium on Logic in Computer Science): A. Muscholl
– LICS’11 (IEEE Symposium on Logic in Computer Science): I. Walukiewicz
– LICS’10 (IEEE Symposium on Logic in Computer Science): A. Muscholl
– MFCS’09 (Mathematical Foundations of Computer Science): A. Muscholl
– MOL’13 (Mathematics of Language): S. Salvati
– MOL’12 (Mathematics of Language): S. Salvati
– RP’11: (5th international workshop on reachability problems): J.Leroux
– RP’12: (6th international workshop on reachability problems): J.Leroux
– RP’13: (7th international workshop on reachability problems): J.Leroux
– RTA-TLCA’14 (Joint 25th International Conference on Rewriting Techniques and Applications and 12th International Conference on Typed Lambda Calculi and Applications): S. Salvati
– STACS’13 (Symposium on Theor. Aspects of Computer Science): M. Zeitoun
– STACS’12 (Symposium on Theor. Aspects of Computer Science): I. Walukiewicz
– TACAS’10 (International Conference on Tools and Algorithms for the Construction and Analysis of Systems): A. Muscholl
– TAG’12 (11th International Workshop on Tree Adjoining Grammars and Related Formalisms): S. Salvati
– TCS’14, IFIP Theoretical Computer Science: G. Sénizergues
– TCS’12, IFIP Theoretical Computer Science: I. Walukiewicz
– TTNLS’14 (Type theory and natural language semantics): C. Retoré

Program committee (national)
– TALN’09 Traitement Automatique du Langage Naturel: C. Retoré
– TALN’11 Traitement Automatique du Langage Naturel: C. Retoré
– TALN’12 Traitement Automatique du Langage Naturel: C. Retoré
– TALN’13 Traitement Automatique du Langage Naturel: C. Retoré
– TALN’14 Traitement Automatique du Langage Naturel: C. Retoré

Presidence of program committee (international)
– ESSLII’09, 21st European Summer School in Logic, Language and Information: C. Rétoré
– GCM’14, Fifth International Workshop on Graph Computation Models: M. Mosbah
– FoSSaCS’14, 17th International Conference on Foundations of Software Science and Computation Structures: A. Muscholl
– GandALF’13, 4th International Symposium on Games, Automata, Logics and Formal Verification: G. Puppis, T. Villa
– SOFSEM’10, 36th International Conference on Current Trends in Theory and Practice of Computer Science: A. Muscholl, D. Peleg

Organizing committee (conferences, seminars, schools...) (international)
– EPIT’11, GAMES-Spring school, Carcans-Maubuisson, May 23-27, 2011 (H. Gimbert)
– MBSAW’12, Model-Based Safety Assessment Workshop, Bordeaux (G. Point)
– Workshop Automata, Concurrency and Timed Systems (ACTS), Chennai, 2009 (P. Weil)
– Workshop en l’honneur de Bruno Courcelle, June 18-20, 2012, Bordeaux (P. Castéran, M. Mosbah, G. Sénizergues)

Presidence of organizing committee (international)
– ACG@10 ten years of Abstract Categorial Grammars, Bordeaux, 2011 (S. Salvati)
– Workshop on Automata, Logic, Formal Languages and Algebra (ALFA), satellite workshop of ICALP’13, Riga (P. Weil)
– Workshop en l’honneur de Bruno Courcelle, June 18-20, 2012, Bordeaux (A. Muscholl)
– Final open conference of ANR project FREC, CIRM Marseille, 2014 (G. Sénizergues)
– Fifth International Workshop on Graph Computation Models (GCM) 2014 (M. Mosbah)
– LCS’10, workshop ’Logic, categories, semantics’, Bordeaux (C. Retoré)
– MBSAW’12, Model-Based Safety Assessment Workshop, Bordeaux (A. Griffault)
– OPODIS (International Conference on Principles of Distributed Systems) 2010, Tunisia (M. Mosbah)
– RP’12, 6th International workshop on Reachability Problems, September 17-19, 2012, Bordeaux (J. Leroux)
– Shonan Summer School on the Coq Proof Assistant, Japan, 2014 (P. Castéran)

Journal editorial board (international)
– Fundamenta Informaticae, I. Walukiewicz (2008- )
– Groups, Complexity and Cryptography, P. Weil (2007-)
– Information and Computation, B. Courcelle (until 2013)
– Information and Computation, G. Sénizergues (2013- )
BIBLIOGRAPHY

– Logical Methods in Computer Science, B. Courcelle (2005-)

Journal editorial board (national)
– La Gazette des mathématiciens, C. Rétoré, (2008-)
– Technique et Science Informatiques, A. Griffault (2008-2012)

Research animation (international)
– IFIP WG2.2 Formal description of programming concepts: I. Walukiewicz (president)

Research animation (national)
– GDR GPL “Génie de la Programmation et du Logiciel” : P. Castéran, co-head of GT “Langages TTypes et Preuves”
– GDR IM “Informatique-Mathématique” : A. Muscholl, co-head of GT “Automata, Logic, Games and Algebra”

Service as expert or evaluator

Presidence of expert committee (national)
– AERES evaluation LIX 2013 (Weil, president)

Membership in expert committee (national)
– AERES evaluation IBISC (H. Gimbert)
– AERES evaluation Ecole doctorale Marseille 2011 (M. Mosbah)
– AERES evaluation SAMOVAR 2013 (M. Mosbah)
– AERES evaluation LIP6 (C. Retoré)
– AERES evaluation LORIA, 2012 (M. Zeitoun)
– Member of CNU section 27, 2011-2015 (M. Mosbah)
– Hiring committee for an assistant professor, U. Paris Diderot, 2010 (H. Gimbert)
– Hiring committee for an assistant professor (chaire), U. Paul Sabatier Toulouse, 2011 (A. Griffault)
– Hiring committee for an assistant professor, IPB Bordeaux, 2011 (A. Griffault)
– Hiring committee for an assistant professor, IRIT ENSEEIHT, 2012 (A. Griffault)
– Hiring committee for an assistant professor, U. Bordeaux 1, 2012 (A. Griffault)
– 2 hiring committees for assistant professors, IPB Bordeaux, 2010 (F. Herbréteau)
– Hiring committee for an assistant professor, U. Aix-en-Provence, 2012, (J. Leroux)
– Hiring committee for an assistant professor, U. Bordeaux 1, 2011 (J. Leroux)
– Hiring committee for an assistant professor, U. Paris Diderot, 2010 (J. Leroux)
– Hiring committee for a full professor, U. de Lorraine, 2009 (M. Mosbah)
– Hiring committee for a full professor, IPB Bordeaux, 2012, 2013 (M. Mosbah)
– Hiring committee for an assistant professor, IPB Bordeaux, 2010 (M. Mosbah)
– Hiring committee for a full professor, INP Toulouse, 2012 (M. Mosbah)
– Hiring committee for an assistant professor, U. Paris Diderot, 2010 (A. Muscholl)
– Hiring committee for an assistant professor (chaire), U. Bordeaux, 2009 (A. Muscholl)
– Hiring committee for a research assistant INRIA, INRIA Bordeaux, 2009 (A. Muscholl)
– Hiring committee for an assistant professor, IUT U. Bordeaux 1, 2011 (A. Muscholl)
– Hiring committee for a full professor, U. Paris 13 (C. Retoré)
– Hiring committee for an assistant professor, U. Toulouse 3, 2010 (A. Rollet)
– Hiring committee for an assistant professor, U. Versailles Saint Quentin, 2009 (A. Rollet)
- Hiring committee for an assistant professor, IUT U. Bordeaux 1, 2013 (M. Zeitoun)
- Hiring committee for an assistant professor, U. Bordeaux 1, 2012 (M. Zeitoun)
- Hiring committee for a full professor, U. Rennes 1, 2010 (M. Zeitoun)

**Individual expert (reviewer)**
- Evaluation ANR 2011 (A. Griffault)
- Evaluation ANR Blanc (C. Retoré)
- Evaluation ANR Contint (C. Retoré)
- Evaluation ANR Masses de Données (C. Retoré)
- Evaluation ANR Blanc 2012 (P. Weil)
- Evaluation ANR Blanc 2011 (P. Weil)
- Evaluation ANR Blanc 2010 (P. Weil)

**Individual expert (reviewer), international**
- Evaluation OTKA (Hungarian Scientific Research Fund), 2013 (S. Lombardy)
- Evaluation FWF (Autriche), 2012 (M. Mosbah)
- Evaluation Israel Science Foundation, 2010 (A. Muscholl)
- Evaluation Netherlands Organisation for Scientific Research (NWO), 2009 (A. Muscholl)
- Evaluation DFG, Allemagne, 2013 (A. Muscholl)
- Evaluation CONICYT (Chili), 2013 (P. Weil)
- Evaluation FSF (Suisse), 2009 (P. Weil)
- Evaluation OTKA (Hungarian Scientific Research Fund), 2009 (P. Weil)
- Evaluation NSA (USA), 2009 (P. Weil)
- Evaluation NSERC (Canada), 2012 (P. Weil)

**Membership in selection board**
- Jury d’admission CR INS2I, 2012 (P. Weil)
- Jury d’admission CR INS2I, 2011 (P. Weil)
- Jury d’admission DR CNRS, 2011 (P. Weil)

**Membership in prize jury**
- Evaluation IBM prize (Belgique), 2010 (J. Leroux)
- EATCS Fellows Committee, 2014-2017 (A. Muscholl, president 2014)
- Prize Board of Witold Lipski Prize (I. Walukiewicz)
- Evaluation PhD prize GDR GPL 2012 (M. Mosbah)
- Evaluation PhD prize GDR GPL 2013 (M. Mosbah)

**Reviewing of PhD or habilitation (international)**
- Thomas Brazdil, HDR Masaryk University, Brno, 2012 (Walukiewicz)
- Tomasz Jurdzinski, HDR Wroclaw University, 2009 (Walukiewicz)
- Manfred Kufleitner, HDR Universität Stuttgart, 2013 (Weil)
- Christof Löding, HDR RTWH Aachen, 2009 (Walukiewicz)
- Nizar Ben Neji, Tunis 2012 (Mosbah)
- Prakash Chandrasekaran, CMI Chennai, 2009 (Muscholl)
- Gaëlle Fontaine, Amsterdam University, 2010 (Walukiewicz)
- Sonia Gaied, Tunis, 2013 (Mosbah)
- Amaldaev Manuel, CMI Chennai, 2011 (Muscholl)

**Reviewing of PhD or habilitation (national)**
- Anne Bouillard, HDR ENS Paris 2014 (Lombardy)
- Thomas Colcombet, HDR LIAFA, 2014 (Walukiewicz)
– Laurent Doyen, HDR ENS Cachan, 2012 (Walukiewicz)
– Thierry Géraud, HDR U. Paris Est, 2012 (Lombardy)
– Mathieu Lafourcade, HDR Université Montpellier 2, 2012 (Retoré)
– Malika More, HDR LAIC-LIMOS, 2009 (Muscholl)
– Myriam Quatrini, HDR I2M Aix-Marseille Université, 2014 (Retoré)

– Nabil Ajam, Rennes, 2010 (Mosbah)
– Bertrand Boisvert, Université Toulouse 3, 2013 (Retoré)
– Florent Bouchy, ENS Cachan, 2009 (Zeitoun)
– Romain Brenguier, ENS Cachan, 2012 (Gimbert)
– Romain Brenguier, ENS Cachan, 2012 (Muscholl)
– Simon Clavière, U. Versailles, 2012 (Mosbah)
– Aiswarya Cyriac, ENS Cachan, 2014 (Muscholl)
– Axel Haddad, LIAFA, 2013 (Walukiewicz)
– Loïc Jezéquel, U. Rennes 1, 2012 (Zeitoun)
– Fatma Krichen, U. Toulouse, 2013 (Mosbah)
– Denis Kupenberg, LIAFA, 2012 (Walukiewicz)
– Benjamin Momème, ENS Cachan 2013 (Lombardy)
– Christophe Onambele, Université Paris 8, 2012 (Retoré)
– Florent Pompigne, Université de Lorraine, 2013 (Retoré)
– Johan Segura Université Montpellier 2, 2012 (Retoré)
– Lilia Sfaxi, Grenoble, 2012 (Mosbah)
– Nathalie Szajjder, ENS Cachan, 2009 (Walukiewicz)
– Camille Vacher, ENS Cachan, 2010 (Walukiewicz)

**Membership of PhD/habilitation committee (international)**

– Alexandre Decan, Université de Mons, Belgique, 2013 (Gauwin)
– Marc Ducobu, Université de Mons, Belgique, 2013 (Gauwin)
– Alessandro Facchini, U. Lausanne, 2010 (Zeitoun)
– Julien Brusten, Université de Liège, 2011 (Leroux)
– Jean-François Degbomont, Université de Liège, 2013 (Leroux)

**Membership of PhD/habilitation committee (national)**

– Dominique Archambault, HDR Université Paris 6, 2010 (Retoré)
– Nicolas Bedon, HDR Université Paris-Est Marne-la-Vallée, 2010 (Weil)
– Anas Abou Elkalam, HDR ENSEIHT Toulouse, 2009 (Mosbah)
– Pascal Desbarats, HDR Bordeaux I, 2010 (Mosbah)
– Annie Foret, HDR Université Rennes 1, 2012 (Retoré)
– Peter Habermehl, HDR LIAFA, 2009 (Muscholl)
– Jérôme Leroux, HDR Bordeaux, 2012 (Muscholl)
– Nicolas Markey, HDR ENS Cachan, 2011 (Muscholl)
– Cyril Nicaud, HDR Université Paris-Est Marne-la-Vallée, 2010 (Weil)
– Macha Nikolski, HDR Université Bordeaux-1, 2009 (Weil)
– Lutz Strassburger, HDR Université Paris 7, 2011 (Retoré)
– Tayssir Touili, HDR LIAFA, 2009 (Muscholl)
– Assalé Adjé, LIX, 2011 (Leroux)
– Pierre-Yves Angrand, Telecom ParisTech 2012 (Lombardy)
– Rodrigo Assar Cuevas, Université Bordeaux-1, 2011 (A. Griffault)
Scientific collaborations

Projects (international)

- GAMES (Games for Design and Verification), ESF Research Networking Programme, 2008-2013. Partners: Vienna University of Technology, Austria; Université Libre de Bruxelles, Belgium; Helsinki University of Technology, Finland; RWTH Aachen University, Germany; University of Udine, Italy; University of Luxembourg, Luxembourg; CWI and University of Amsterdam, The Netherlands; Warsaw University, Poland; Uppsala University, Sweden; EPFL Lausanne, Switzerland; Oxford University, United Kingdom
- LIA Informel (INdo-French FORmal MEthods Lab), CNRS, ENS Cachan, U. Bordeaux, Chennai Mathematical Institute (CMI), Institute of Mathematical Sciences (IMSc, Chennai) and Indian Institute of Sciences (IISc, Bangalore)
- PHC France-Italy (GALILEE) with University of Padova - Italy “Sécurité de protocoles distribués”, 2014. (M. Mosbah)
- SAFE, Safe Automotive sofTware architecTure, UE project, 2011–2014. (A. Griffault)
- Royal Society grant with University of Liverpool “Specification and Verification of Infinite-State Systems: Focus on Data”, 2011–2013. (J. Leroux)
- VAUCANSON2 (Développement de la plateforme Vaucanson), ANR blanc international with Taiwan, 2011-2014. (S. Lombardy)

Projects (national)

- ANR ExStream, Extensions of stream processing, ANR JCJC, 2014-2018. (O. Gauwin)
- ANR FREC, Frontiers of recognizability, ANR BLANC, 2010-2014. (P. Weil)
– ANR LOCI, Locativity and interactivity in logic, linguistics and theoretical computer science, ANR Blanc, 2010-2014. (Ch. Rétoré)
– ANR POLYMNIE, Parsing and synthesis with abstract categorial grammars: from lexicon to discourse, ANR CONTINT, 2012-2015. (Ch. Rétoré)
– CoLan PEPS Humanités, Mathématiques, Informatique Complexité et Langage : une étude formelle et expérimentale des mécanismes de compréhension, 2013-2014. (Ch. Rétoré)
– MARSHAL, FUI project (Fonds Unique Interministériel), 2012-2014. (E. Fleury)
– Stochastic Games for Verification, PEPS 2011-2013. (H. Gimbert)

Joint publications (international)
– Michele Abrusci, Roma Italy (Retore)
– Jorge Almeida, Porto (Zeitoun)
– Michael Benedikt, Oxford (Puppis)
– Achim Blumensath, Darmstadt (Courcelle)
– Bernard Boigelot, Liège (Leroux, Herbreteau)
– Mikolaj Bojanczyk, Warsaw U. (Muscholl, Walukiewicz, Place)
– Thomas Brihaye, Mons (Gimbert)
– Véronique Bruyère, Mons (Gimbert, Gauwin)
– Krishnendu Chatterjee, IST Austria (Gimbert)
– Lorenzo Clemente, Bruxelles (Herbreteau, Sutre)
– Mauro Conti, Padova (Mosbah)
– José Carlos Costa, U. Minho (Zeitoun)
– Alfredo Costa, U.Coimbra Portugal (Zeitoun)
– Volker Diekert, Stuttgart (Muscholl, Weil)
– Joost Engelfriet, Leiden U. (Courcelle)
– Zoltan Esik, Szeged Hungary (Weil)
– Emmanuel Filliot, Bruxelles (Gauwin)
– Makoto Kanazawa, NII Tokyo (Salvati)
– Daniel Kirsten, Berlin (Lombardy)
– Gregory M. Kobele, U. Chicago (Salvati)
– Daniel Kroening, Oxford (Leroux)
– Manfred Kufleitner, Stuttgart (Weil)
– Kim G. Larsen, Aalborg, Denmark (Rollet)
– Christof Loeding, Aachen Germany (Walukiewicz)
– Angelo Montanari, Udine Italy (Puppis)
– Michael Moortgat, Utrecht, Netherlands (Moot)
– Damian Niwinski, Warsaw U. (Walukiewicz)
– Pawel Parys, Warsaw U. (Walukiewicz)
- M. Praveen, CMI Chennai (Sutre, Leroux)
- Sven Schewe, U. Liverpool (Muscholl)
- Thomas Schwentick, Dortmund (Muscholl)
- Helmut Seidl, Munich (Leroux, Muscholl)
- Frederic Servais, Bruxelles (Gauwin)
- Pedro Silva, Porto (Weil)
- B. Srivathsan, CMI Chennai India (Walukiewicz, Herbreteau)
- Howard Straubing, Boston (Walukiewicz)
- Zhilin Wu, Academy of Sciences, China (Muscholl, Ly)
- Habib Youssef, Sousse Tunisia (Mosbah)

**Joint publications (national)**
- S. Abiteboul, LSV Cachan (Muscholl)
- A. Akhavi, Greyc Caen (Lombardy)
- M. Amblard, LORIA Nancy (Retore)
- G. Audemard, CRIL Lens (Simon)
- S. Bardin, CEA Paris (Leroux, Vincent, Ly)
- F. Bassino, LIPN Paris-Nord (Weil)
- M.P. Béal, LIGM, Paris-Est (Lombardy)
- N. Bertrand, IRISA Rennes (Gimbert)
- B. Bollig, LSV Cachan (Zeitoun)
- P. Bourhis, LIFL Lille (Muscholl, Puppis)
- A. Carayol, LIGM Paris-Est (Walukiewicz)
- O. Carton, LIAFA, Paris (Lombardy, Puppis)
- J.M. Champanaun, LITIS Rouen (Lombardy)
- Th. Colcombet, LIAFA, Paris (Lombardy, Puppis)
- J.M. Couvreur, LIFO Orléans (Weil)
- Y. Falcone, LIG Grenoble (Rollet)
- A. Finkel, LSV Cachan (Leroux, Zeitoun)
- P. Gastin, LSV Cachan (Zeitoun)
- B. Genest, IRISA Rennes (Gimbert, Muscholl, Walukiewicz)
- L. Goubin, PRISM Versailles (Ly)
- F. Horn, LIAFA Paris (Gimbert)
- T. Jerron, IRISA Rennes (Rollet)
- M. Kanté, LIMOS Clermont-Ferrand (Courcelle)
- I. Klimann, LIAFA Paris (Lombardy)
- J. Mairesse, LIAFA Paris (Lombardy)
- D. Mery, LORIA Nancy (Mosbah)
- C. Nicaud, LIGM Paris-Est (Weil)
- J. Niehen LIFL, Lille (Gauwin)
- D. Perrin, LIGM, Paris-Est (Lombardy)
- M. Picantin, LIAFA Paris (Lombardy)
- S. Pogodalla, INRIA Nancy (Retore)
- D. Poitrenaud, LIP6, Paris (Weil)
- O. Ponsini, I3S, Nice (Rollet)
- P.A. Reynier LIF Marseille (Gauwin)
- J. Sakarovitch, ENST Paris (Lombardy)
- S. Salva, LIMOS Clermont-Ferrand (Rollet)
- L. Segoufin, LSV Cachan (Place, Muscholl)
- J.M. Talbot, LIF Marseille (Gauwin)
- S. Tison LIFL, Lille (Gauwin)
- W. Zielonka, LIAFA Paris (Gimbert)

**Research visitors (international)**
- Bharat Adsul, IIT Bombay (6 weeks, jun-jul 2013)
- Jorge Almeida, Porto (6 months, feb-aug 2012)
- Namit Chaturvedi, RWTH Aachen (1 week, mar 2014)
- José Carlos Costa, U. Minho (1 week, apr 2012)
- Alfredo Costa, U. Coimbra (1 week, jun 2012)
- Volker Diekert, Stuttgart (1 month, mar 2011)
- Makoto Kanazawa, NII Tokyo (1 month, apr/sep 2011)
- Gregory M. Kobele, U. Chicago (1 month, apr-may 2012)
- Manfred Kufleitner, U. Stuttgart (1 week, sep 2013)
- Salvatore La Torre, U. Salerno (1 month, may-jun 2014)
- Zhaohui Luo, University of London (1 month, nov/dec 2011)
- Amaldev Manuel, postdoc LIAFA (3 months, oct-dec 2012)
- Alexei Miasnikov, Stevens Institute of Technology, Hoboken, jan 2011
- Sven Schewe, U. Liverpool (1 month, sep 2012, jan 2013)
- Srivathsan, CMI Chennai (2 weeks, jun 2014)
- Zhilin Wu, Academy of Sciences, China (may-jul 2012)

**Research visits (international)**
- Gimbert : Mons U., Belgium 2011
- Gimbert : IPAL, Singapour 2013
- Herbreteau : IIT Bombay, India 2011
- Herbreteau : Liège, Belgium 2011
- Janin : York U., UK 2012
- Janin : Herriot Watt University, UK 2013
- Janin : Yale University, USA 2013
- Janin : Bristol University, UK 2013
- Janin : Darmstadt University, Germany 2012, 2013
- Leroux : Liverpool U., UK, 2013
- Muscholl : Warsaw University, Poland 2012
- Puppis : Oxford U, UK, 2012
- Retore : Verona, Italy 2010
- Walukiewicz : Warsaw University, Poland 2012
- Weil : IIT Delhi, India 2007-2009
- Weil : Stevens Inst. of Technology, Hoboken, USA 2009, 2010
- Weil : U. Fribourg, Switzerland 2009
- Weil : U. Stuttgart, Germany 2011
- Zeitoun : Porto, Portugal 2013
Invited talks

- ASL’14, 2014 (S. Salvati)
- ATVA’13, Hanoi, Vietnam: J. Leroux (talk and tutorial)
- ATVA’10, Singapore (I. Walukiewicz)
- AutoMathA 2009, Conference of the AutoMathA programme, Liege, Belgium (I. Walukiewicz)
- Barcelona Week-end in Group Theory, Barcelona, 2014 (P. Weil)
- On the Posterity of Büchi (Logic and Automata) Swiss Society for Logic and Philosophy, Annual Meeting, Lausanne 2011 (I. Walukiewicz)
- CAI’09, Thessaloniki, Greece (B. Courcelle)
- CONCUR’10, Paris (A. Muscholl)
- Conference on Geometric and Asymptotic Group Theory and Applications, Hoboken, 2009 (P. Weil)
- Conference on Geometric and Combinatorial Methods in Group Theory and Semigroup Theory, Lincoln, 2009 (P. Weil)
- Conference on Geometric and Asymptotic Group Theory and Applications, Montréal, 2010 (P. Weil)
- Conference on Automorphisms of free groups, Barcelona, 2012 (P. Weil)
- Conference on Semigroups, Algebras and Operator Theory, Kochi, 2014 (P. Weil)
- CSR’14, Moscow, Russia (I. Walukiewicz)
- DIMAP workshop on Algorithmic Graph Theory, Warwick, 2009 (B. Courcelle)
- Durham workshop on graphs and application, 2013 (B. Courcelle)
- ESSLLI’09, Bordeaux (B. Courcelle)
- EuroComb’09, Bordeaux (B. Courcelle)
- EWM summerschool, Leiden, the Netherlands, 2011 (A. Muscholl)
- Formal grammar 19th, Tübingen, 2014 (C. Retoré)
- FSTTCS’10, Chennai, India (B. Courcelle)
- GAMES’12 Napoli, Italy (H. Gimbert)
- GAMES’12, Napoli, Italy (A. Muscholl)
- Winter GAMES School 2013, Champéry, Switzerland (I. Walukiewicz, tutorial)
- Winter GAMES School 2013, Champéry, Switzerland (A. Muscholl, tutorial)
- GASSICS’11 (H. Gimbert)
- GPMFV’10 (H. Gimbert)
- GROW’11, Daejon, Korea (B. Courcelle)
- GROW’13, Santorini, Greece (B. Courcelle)
- Groups in Galway, Galway, 2013 (P. Weil)
- Highlights’13, Paris (J. Leroux, tutorial)
- Highlights of AutoMathA 2010 conference of the programme ESF AutoMathA, Vienna, Austria (I. Walukiewicz)
- Higher Order Schemes, Paris, 2010 (G. Sénizergues)
- IHP trimester on Semantics of proofs and certified mathematics 2014 (S. Salvati)
- 7th workshop on Lambda Calculus and Formal Grammars, Bordeaux, 2009 (G. Sénizergues)
- LATA’09, Tarragona, Spain (B. Courcelle)
- LATA’10, Trier, Germany (A. Muscholl)
- LATA’11, Tarragona, Spain (J. Leroux)
- MCFG+ 2010 (S. Salvati)
- MCFG+2 2011 (S. Salvati)
- MFCS’12, Bratislava, Slovakia (I. Walukiewicz)
- Thirteenth NBSAN meeting, November 2012, York, UK (D. Janin)
– PAVAS’11, Cachan, France (J. Leroux, tutorial)
– Reachability Problems 2011, Genova, Italy (B. Courcelle)
– Reachability Problems 2012, Bordeaux (I. Walukiewicz)
– Joint SAMS-AMS Conference, Special Session on Combinatorial and Computational Group Theory and Applications, Port Elizabeth, 2011 (P. Weil)
– SOFSEM’14, Nový Smokovec, High Tatras, Slovakia (D. Janin)
– Sri K. Lakshaman Memorial Distinguished Lecture, Chennai Mathematical Institute, 2014 (P. Weil)
– TU Dresden PhD Programme QuantLA, spring school, 2013 (A. Muscholl, tutorial)
– VPT@CAV’13, Saint Petersburg, Russia (J. Leroux)
– WoLLIC’12, Buenos Aires, Argentina (A. Muscholl)
– WoLLIC’09, Tokyo, Japan (S. Salvati)
– Workshop on Automata, Logic, Formal languages, and Algebra 2013, Riga (M. Zeitoun)

A.1.3 Involvement with social, economic and cultural actors

Collaborations with the industry

Industrial contracts
– Collaboration with VITIROVER SAS, France within the EU project VVINNER (Vineyard Vigilant & INNovative Ecological Rover), 2012-2015

Collaborations outside of universities
– Collaboration with ClearSy Safety Critical Systems Engineering within the ANR project RIMEL (ANR “Sécurité et Informatique”, 2007 - 2010)
– Collaboration with EDF R&D, Dassault Systèmes within the ANR project Vacsim (ANR INS 2011-2015)

Start-ups
– Rhoban System S.A.S: since jan 2012. Ingénierie conseil en Robotique

General audience actions

Learned society, federation (national)
– Member of scientific council of SIF (Muscholl)

Scientific popularization, dissemination of scientific culture
– “Fête de la science” oct 2010, several scientific presentations for highscool (LLI team)
– Forum des métiers, collège Alain Fournier, Bordeaux (Weil, 2013)
– International exhibition EXPO 2012, Yeoou Korea 2012, French pavillon (Gimbert, Ly)
– Introduction to Computer Science for highscool “Initiation à l’informatique”, with Institut Régional de Recherche sur l’Enseignement des Mathématiques, 2010-2014 (Rétoré)
– Organization of a short visit of LaBRI by a group of students of ENS Cachan, and coordination of scientific presentations of members of LaBRI 2013 (Place, Zeitoun)
– Participation at “Des enseignants dans les laboratoires”, CNRS and Rectorat de Bordeaux, 2014 (Weil, Zeitoun)
– Participation at the exhibition “Mathissimes” (Gimbert, jan 2012)
– Presentation of research employments (métiers de la recherche), ENSEIRB-Matmeca (Weil, 2013 and 2014)
– Presentations for colleges (classes de 6ème, 4ème), 2013 “Maths à modeler” (Zeitoun)
– Presentations for highscool (classes de 1ère S) and introduction to Computer Science (Zeitoun)
Presentations at the forum “Maths en jeans”, apr 2014 (Zeitoun)
Presentation for primary schools (CP/CE1), Ecole Martinon Gradignan, 2014 (Muscholl)
RIEL: Teaching research in Computer Science for undergraduates (Dicky, Zeitoun, 2012 et 2013)
Robot presentation “Ergo-robots” at the mathematics exhibition “Mathématiques, un dépaysement soudain”, Fondation Cartier, 2011 (Gimbert, Ly)
Robocup 2014, Bresil (Gimbert, Ly)
Scientific animation for general audience at Cap Science Bordeaux about game theory (Gimbert, Oualhadj dec 2009)
Seminar “Unithé ou café”, INRIA Bordeaux Sud-Ouest “Un peu de nuance dans une logique de brutes: la question du sens en linguistique informatique”, 2010 (Rétoré)
Seminar “Parler et comprendre : processus cognitifs et modèles informatiques de la faculté langage” proposée par l’Asco et club cognitique, Bordeaux, Université Bordeaux 2 Victor Ségalen, 2010 (Rétoré)

Publications for large audience
Edition of write-ups of “Leçons de Mathématiques d’Aujourd’hui” published by Cassini (Sénizergues)

A.1.4 Master, predoc and postdoc researchers
S. Agrawal : undergraduate internship , 2009 (Zeitoun, Leroux, Vincent)
R. Bonnin, master internship 2012 (Gimbert)
P. Brunet, master internship ENS Cachan, 2009 (Clément, Retoré)
R. Cheval, master internship ENS Cachan 2012 (Gimbert)
Aakash Deshpande, internship IIT Bombay, 2014 (Herbreteau, Walukiewicz)
Etienne Dubourg, master internship 2012 (Sénizergues)
R. Duvignau, master internship 2012 (Muscholl, Gauwin)
R. Duvignau, master internship M1, 2011 (Gimbert, Muscholl)
Michael Färber, master internship & master thesis Innsbruck, 2013 (Sénizergues, Cezary Kaliszyk)
Julien Ferté, master internship, MPRI Paris 7, 2009 (Sénizergues)
T. Godin, master internship 2014 (Gimbert, Muscholl)
Vipul Harsh, internship IIT Bombay, 2013 (Leroux, Sutre)
E. Kelmendi, master internship 2013 (Gimbert)
E. Kien, master internship ENS Cachan, 2010 (Retoré, Salvati)
J. Kirman, master internship 2010 (Clément, Salvati)
O. Lacroix, master internship 2011 (Retoré)
Julien Laverny, master internship 2013 (Herbreteau, Walukiewicz)
J. Ledent, internship undergraduate ENS Lyon, 2013 (Muscholl, Salvati)
Umang Mathur, internship IIT Bombay, 2013 (Herbreteau, Walukiewicz)
Y. Oualhadj, master internship 2010 (Gimbert)
J. Pautriez, master internship 2013 (Muscholl, Gauwin)
C. Pennarun, master internship M1, 2013 (Muscholl, Salvati)
V. Pennelle, master internship 2011 (Leroux, Sutre)
Prajwal A N, internship IIT Bombay, 2012 (Herbreteau, Walukiewicz)
Cédric Ramassany, master internship 2009 (Rollet)
T. Rocher, master internship 2014 (Muscholl, Salvati)
Noemie Sandillon-Rezer, master internship 2011 (Sénizergues, Moot)
Siddharth K., internship CMI Chennai, 2012 (Muscholl, Gimbert)
– Aditya Tiwari, internship IIT Bombay, 2011 (Herbreteau, Walukiewicz)
– Sukriti Bhattacharya, postdoc (2013, Fleury), 12 months
– Laurent Braud, postdoc (2011-2012, Salvati, Sénizergues), 12 months
– Lorenzo Clemente, postdoc (2011-2013, Herbreteau, Sutre, Walukiewicz), 24 months
– Julien Ferté, ATER 2012, 6 months
– Omer Nguena-Timo, postdoc (2009-2011, 2012-2013, Rollet), 24 months
– Fabio Pasquali, postdoc (2014, Retoré), 12 months
– Manjunatha Praveen, postdoc (2013, Leroux, Sutre), 12 months
– Patrick Totzek, postdoc (2014, Leroux, Sutre), 8 months
– Zhilin Wu, postdoc (2009, Muscholl), 12 months