



2025

LABORATOIRE
BORDELAIS
DE RECHERCHE
EN INFORMATIQUE

LaBRI

LaBRI

LaBRI is a research unit attached to the CNRS, the University of Bordeaux and Bordeaux INP. LaBRI has been a partner of Inria since 2002.

LaBRI's missions cover three key areas: research, training and technology transfers. The research conducted at LaBRI is both fundamental and purpose-driven. It targets the IT sector at large. Training mainly focuses on PhD programmes, as well as dissemination activities aimed at younger audiences. Technology transfers are achieved through collaborations with industry and the creation of start-ups.

LaBRI is firmly rooted in its ecosystem. Funding from the Nouvelle-Aquitaine Regional Council towards a building extension, equipment, and PhD and post-doctoral scholarships was one of the cornerstones of its development.

www.labri.fr

LaBRI (Laboratoire Bordelais de Recherche en Informatique – Bordeaux IT Research Laboratory) is a joint research unit (UMR 5800) under the supervision of:

and in partnership
with:

université
de BORDEAUX



BORDEAUX
INP

Inria

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Key figures:

Total staff: 306



78

women



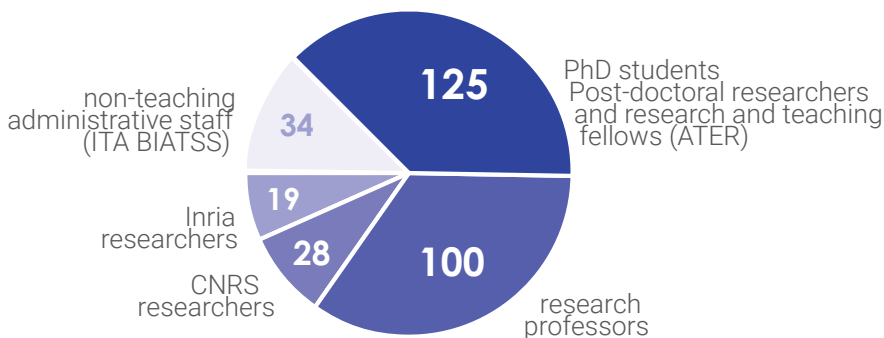
228

men



29

nationalities



Scientific publications*

*HAL extraction



86

journal
papers



141

conference
papers



5

collections of
works



32

theses
defended



Budget



€399K

in grants



Regional
contract

€228K
spent

67K€
acquired



European
projects

€87K
spent

€0K
acquired



ANR (Nation-
al Research
Agency)

€1,302K
spent

€1,603K
acquired



PEPR (Priority
Research Pro-
gramme and
Equipment)

€447K
spent

€382K
acquired

Leveraging



25 software tools



4 platforms

SCRIME
PlaFRIM
LSD
Volbrain



16 start-ups



A word from the director

Xavier Blanc, Director



LaBRI's scientific vitality was confirmed in 2025. This year was marked by several significant achievements. Laboratory members received the Best Paper Award at the AAAI 2025 conference – one of the leading international events in artificial intelligence. Anca Muscholl was elected a Fellow of the EATCS in recognition of her contributions to the theoretical foundations of computer science. Vincent Delecroix was awarded the Claude Berthault Prize by the Academy of Sciences. These individual achievements reflect the quality of the work carried out collectively by the laboratory.

We also hosted the JOBIM conference in Bordeaux. This annual symposium for the French-speaking bioinformatics community brought together several hundred participants to discuss the interplay between computer science, mathematics and life sciences. It demonstrates our commitment to interdisciplinarity and our ability to organise major scientific events.

Beyond these highlights, it has been a busy year: we have launched strategic projects, forged new collaborations, adjusted some of our internal structures, and continued our interdisciplinary partnerships, particularly at the interface between life sciences and healthcare. LaBRI continues to evolve to ensure it remains clearly organised, consistent and ambitious, while remaining as diverse as ever.



Here you will find details of the work carried out within our research departments, the vital role of the of the Research Support Department, and the key actions we are supporting, from cross-cutting initiatives to interdisciplinary collaborations to chairs and projects endorsed by our members.

This brochure also reflects our community's commitment to scientific outreach and academic life.

**We hope you
enjoy reading it!**

5 departments and 17 research teams



**Combinatorics
and Algorithms**
(CombAlgo)



**Image
and sound**
(I&S)



**Formal Models
and Methods**
(M2F)



**Supports and
Algorithms for
High-Performance
Digital Applications**
(SATANAS)



**Systems
and Data**
(SeD)



**1 Research
Support department** (SaR)

consisting of 3 teams:

- Administrative,
- Finance,
- Systems and networks



2 cross-cutting missions
+ specific courses of action

- Communication
- Structuring projects, innovation and transfer (PSIT)



2 cross-cutting areas

- Artificial intelligence (AI)
- Digital health (E-Health)



**3 Bordeaux University
Foundation Chairs**

- Cybersecurity
- AI
- MTI

COMBALGO – Combinatorics and Algorithms Department



This department analyses and designs **algorithms and structures of discrete combinatorial data**. Each of the four teams runs a weekly seminar.



AD (Distributed Algorithms) submits algorithms to a non-centralised environment between several communicating entities.



CI (Combinatorics and Interactions) describes, codes and breaks down the fundamental discrete structures of computer science and other sciences.



GO (Graphs and Optimisation) examines the structural properties of graphs in relation to the design of efficient algorithms.



ICQ (Quantum Computing and Information) draws on many of the previous concepts for quantum computers and states.

KEY EVENTS

Whatever we prove well we programme clearly!

As computer scientists who rely on proofs for their theorems, department members formalise their reasoning in order to automate their methods and extend their scope to situations obscured by combinatorial explosions in the number of cases to be studied.

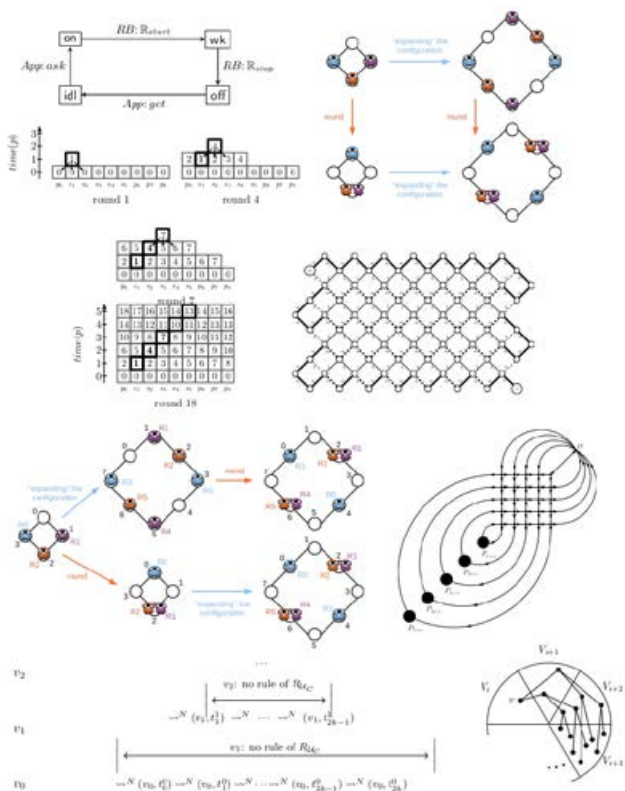
ANR projects (funded by the French National Research Agency) are being launched to bridge the gap between the discharging method in graph theory and combinatorial optimisation, and to use proof assistants such as Coq/Rocq – requiring object-oriented programming enriched with properties – to analyse distributed algorithms.

AD team

We focus on designing reliable **distributed algorithms** that can withstand connectivity fluctuations, can be scaled up, and with formally provable behaviour.

Topics covered include energy-efficient

distributed computing, the use of proof assistants such as Rocq, fault-tolerant and efficient algorithms, modelling and studying the algorithmic properties of distributed and dynamic networks, as well as mobile agents and local computation models, including the “sleeping model”.



KEY EVENTS

Organisation of the 2025 JNIFM (French National Day of Mathematical Computing) by the GDR IFM (Fundamental Mathematics, Computing and Research Group), which attracted around 100 participants.

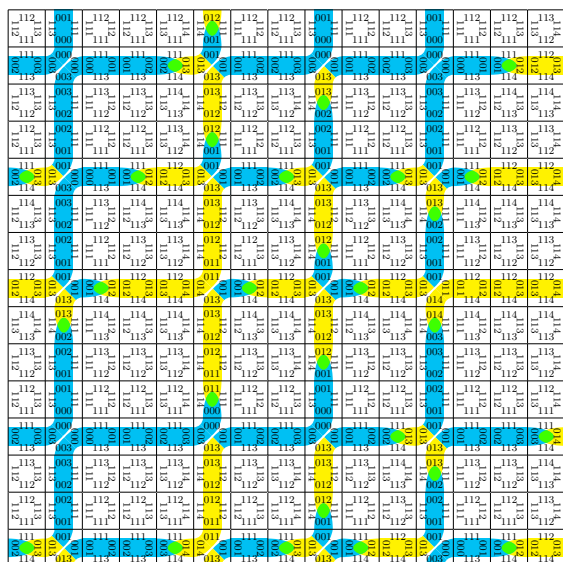
Presentation of our research findings with PhD students and post-doctoral researchers at leading conferences in the field: STACS (Time-efficient self-stabilising unison algorithm), PODC (Robot activation in an unknown environment), ISAAC (Realisation of temporally connected graphs based on degree sequences).

Papers have also been published in the *Distributed Computing*, *Discrete Applied Mathematics*, and *Acta Informatica* journals.

CI team

Combinatorics is **the study of discrete structures** that arise in computer science, mathematics, physics, etc. The most commonly studied areas include trees, permutations and combinatorial maps.

The team's main research activity aims to obtain mathematical results describing these discrete structures, as well as their relationships and behaviour. These results are particularly relevant to analysing algorithms. At the national level, the community organises events such as Journées de Combinatoires de Bordeaux (Bordeaux Combinatorics Days), held every year by team members.



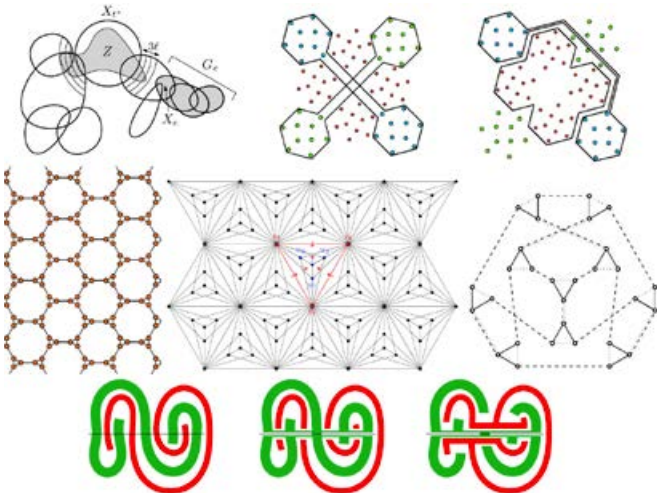
KEY EVENTS

On 25 November 2025, at the Institut de France, Vincent Delecroix, a member of the CI team, received the Claude Berthault Prize, awarded by the Academy of Sciences to “recognise a scientific work that could enhance the reputation of the French nation”. His award-winning research combines dynamic systems, combinatorics, geometry and algorithms.

GO team

Graph theory is a powerful tool for **modelling complex combinatorial structures**. Our research focuses on the development of this theory and its applications, particularly in the field of network communications. We analyse classic problems in their most recent developments and introduce new lines of research. Our expertise in graph theory lies particularly in the structure of graphs. We use

it for a variety of purposes, including analysing the parameters of general graphs and more highly structured graphs (planar, of bounded tree-width, with forbidden minors, etc.), graph colouring, computing compact routing tables, distance labelling, communication algorithms, graph coding and graph games.



KEY EVENTS

Over the course of the year, the team hosted around thirty visiting researchers from Europe (Oxford, Prague, Warsaw, Leipzig, etc.), Asia (Tokyo, Singapore, Daejeon, etc.) and the Americas (Boston, Waterloo, Halifax, Rio, etc.), and had papers accepted at conferences including ICALP'25, FOCS'25 and SODA'25. These articles, all co-authored by PhD students in the team, deal with issues relating to induced minors in graphs, the election of representatives and metric sparsity. Since this year, the team is represented on the editorial board of the *Journal of Combinatorial Theory, Series B*, the leading journal in the field.

ICQ team

Quantum computing is a recent branch of computing that emerged in the early 1980s. It draws on the **laws of quantum mechanics** to extend the capabilities of today's computing and communications tools.

Although quantum computers are still in the prototype stage, there are precise mathematical models that anticipate their potential. In this context, the ICQ team focuses on the **computational gains** offered by quantum algorithms, their practical implementation in quantum machines and, more generally, the nature and use of quantum information.

KEY EVENTS

The Maison du Quantique de Nouvelle-Aquitaine (Nouvelle-Aquitaine Quantum Centre), a project bringing together the regional hybrid quantum computing ecosystem and coordinated by LaBRI members (the ICQ team and the SATANAS department), has completed its first year of operation. The team has organised and participated in several events in this context, such as La Journée Quantique en Nouvelle-Aquitaine (Nouvelle-Aquitaine region Quantum Day) at the IOGS (Institut d'optique Graduate School), the CEMRACS summer school on quantum computing in Marseille, the Bordeaux-Basque Country meeting on quantum algorithms in Bayonne, and the weekly research seminar on quantum computing at LaBRI.

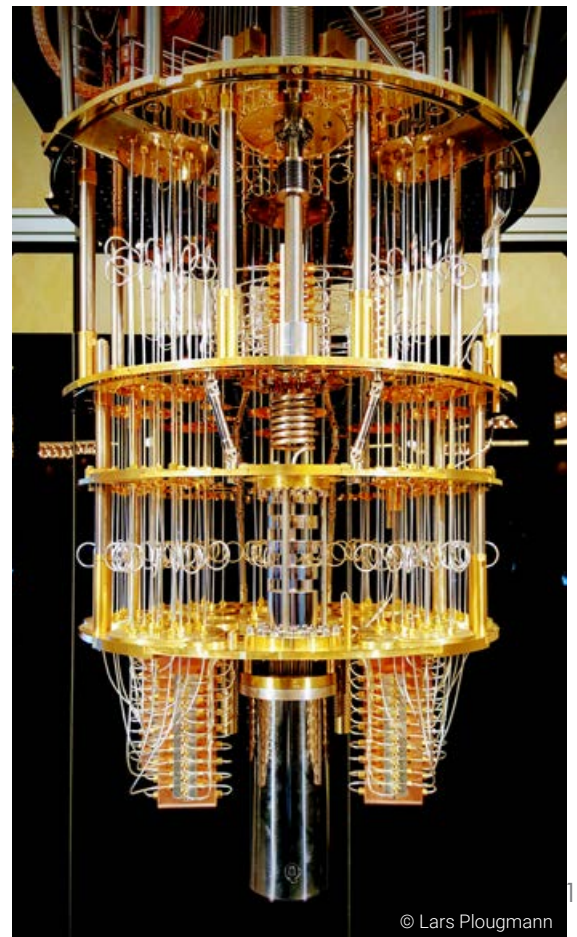
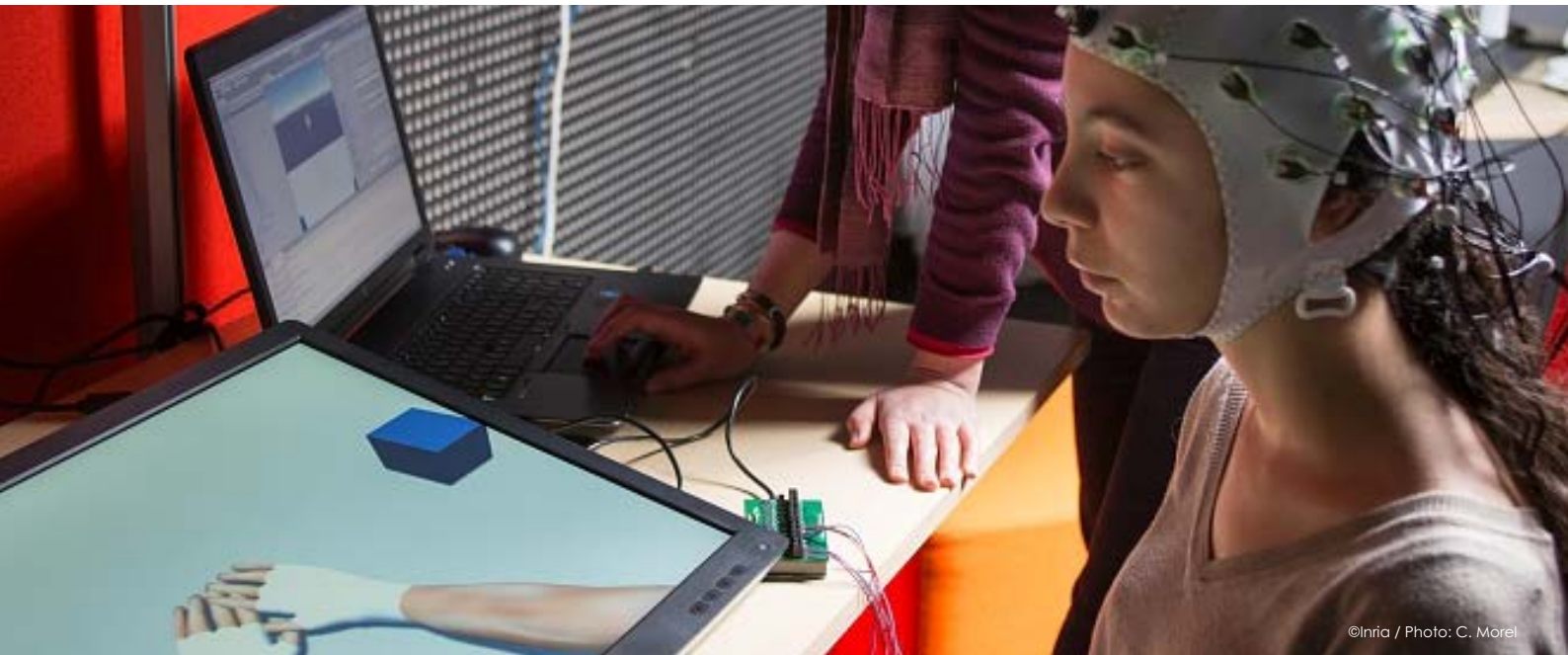


IMAGE & SOUND – I&S

Department



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The I&S department conducts research into the **acquisition, processing, analysis, modelling, synthesis and interaction** of audiovisual media, as well as the use of this media for data exploration and communication.

It manipulates a very broad spectrum of data which includes 2D and 3D images, videos, speeches, music, 3D data, EEG, physiological data, etc. The various stages in the processing chain involve modelling phases for both analysis and synthesis. Applications are aimed at health, medicine, education, games, the environment, etc.

KEY EVENTS

Numerous projects have been approved. The ANR STIM-BCI project focuses on brain-machine interfaces and somatosensory stimulation, with significant potential for both fundamental and applied neuroscience.

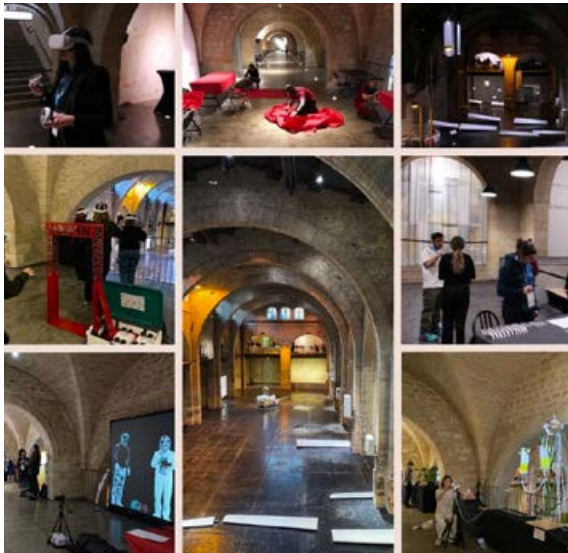
The Comedo project aims to develop new methodological and technological approaches to aid in the analysis and understanding of complex data.

Finally, the MSCA EXPLORA doctoral network is investigating active human exploration and its links with sensory perception. This project combines science, engineering and the arts to develop innovative interactive and immersive technologies.

MANIOC team

We design **multimodal acquisition, restitution, interaction and visualisation systems**, and study the underlying human-machine interaction processes.

We develop tools for 3D modelling and visualisation to help bridge the gap between the real and virtual worlds.



TEI'25: Demos, Arts & Performance at CAPC - Musée d'Art Contemporain de Bordeaux

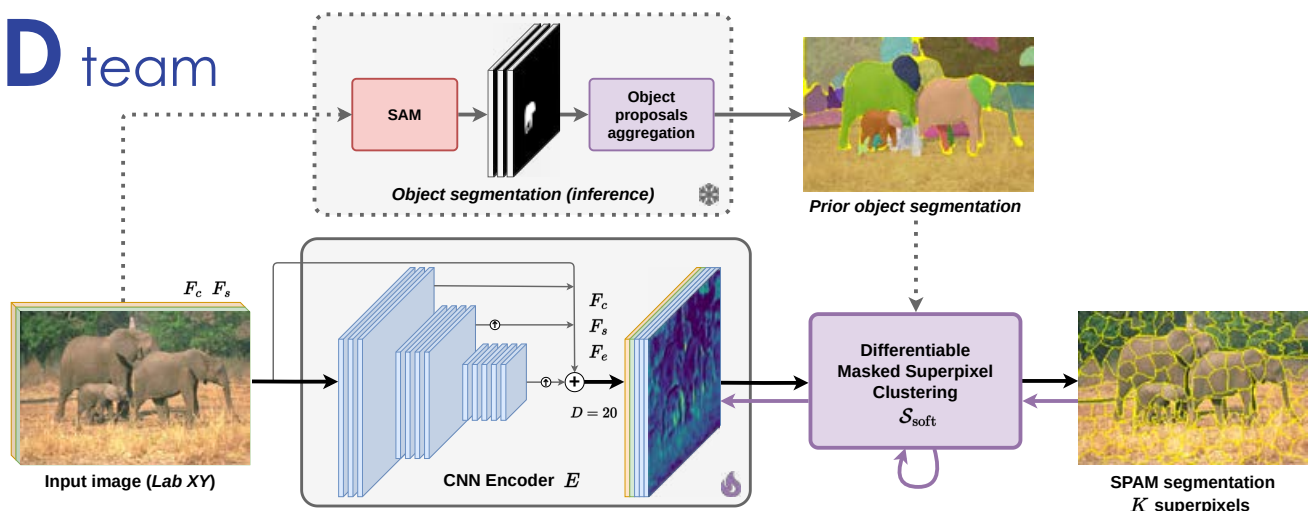
We are exploring approaches based on augmented reality (AR, VR), tangible interaction, brain-computer interfaces and physiological interfaces. This research is being conducted by the Manao, Potioc and Bivwac joint project teams (Inria Centre at the University of Bordeaux).

KEY EVENTS

One of the highlights of the year was the organisation of the 2025 TEI international conference in Bordeaux, dedicated to tangible and embodied interaction (Yvonne Jansen, general co-chair).

In 2025, Manioc also featured heavily at the annual VIS conference, where the team presented its work on augmented reality visualisations, physical and participatory visualisations, and mechanisms for improving communication about data provenance (Valentin Edelsbrunner et al. received a Best Paper Award and Honourable Mention).

TAD team



Our team conducts methodological research into **machine learning and deep neural networks** to analyse complex data (images, video, sound, speech, music). They cover the entire processing chain, from data acquisition to prediction, with a focus on frugal learning, interpretability and structuring information.

Working closely with LaBRI's AI and Digital Health research areas, the team focuses on analysing natural images and speech, as well as multimodal fusion and music creation, in collaboration with the SCRIME platform.

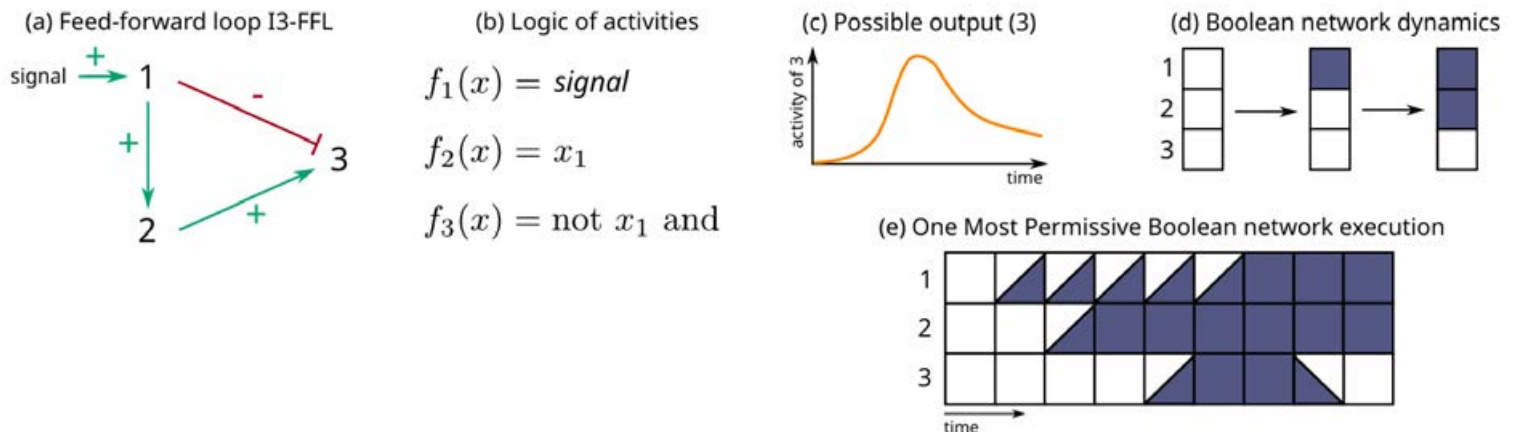
KEY EVENTS

The SPEAKCARE project, in partnership with the Phonetics and Phonology Laboratory (Laboratoire de Phonétique et Phonologie, LPP, Paris), was selected under the CNRS's 80PRIME programme, which aims to support and strengthen interdisciplinary, multi-team research. The European FVLLMONTI project has released a video showcasing its work on new technologies for real-time speech translation.

In addition, the TAD team is involved in the PEPR (Priority Research Programme and Equipment) on neurodegenerative diseases (WP AI).

FORMAL METHODS AND MODELS – M2F

Department



M2F's research themes are rooted in **automata theory, logic and algebra**. These areas are being developed as fundamental research, in particular by the LX team, which is characterising the expressiveness of certain logics and the algorithmic complexity of associated decision-making problems.

These developments are used for various applications:

- + to create trustworthy programmes and protocols (MTV team),
- + to improve queries in databases and knowledge bases (RATIO team),
- + to automatically generate programmes from specifications (SYNTHESE team),
- + to control robots and intelligent transport systems (DART team).

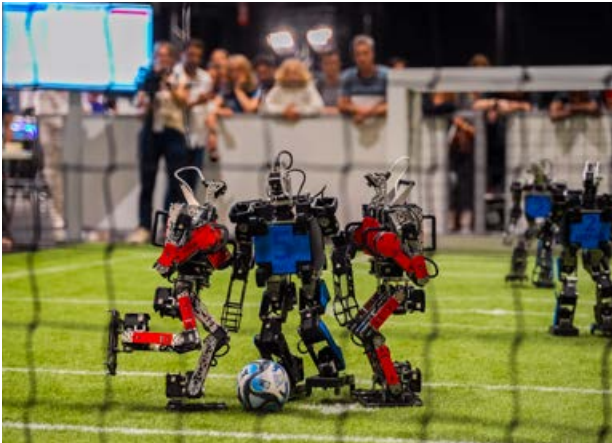
KEY EVENTS

- Anca Muscholl was appointed an EATCS (European Association of Theoretical Computer Science) Fellow in 2025.
- monProjetSup was promoted by the French Ministry of Education.
- Co-organisation of the MIMM project ("Moi Informaticienne, Moi Mathématicienne") promoting women in IT and maths.
- Organisation of the RobNA event at Place Pey-Berland, Bordeaux.
- 5 new ANR projects.
- Winner of the Robotic Transfer Challenge.

DART team

The DART team (LaBRI) brings together the expertise of the Rhoban and Inria Mnemosyne teams.

Rhoban draws on a wide range of skills, from **mechanical design to programming**, with a clear shift towards AI-based approaches. Their work focuses on humanoid and agricultural robotics (mechanisation of transplanting).



Mnemosyne complements this area of research with their work on **bio-inspired AI**. DART's activities also feature an educational component, including developing kits and organising junior competitions.

KEY EVENTS

In 2025, Rhoban once again took part in RoboCup (Brazil), beginning the transition to modern humanoid platforms in light of growing competition.

The team's scientific expertise has been demonstrated through several publications in high-level conferences on modelling and control. The agricultural component was organised around the GORT project, while the transfer of skills was marked by the creation of a University Diploma in Artificial Intelligence at Bordeaux Montaigne IUT (CMA Cap IA ANR project).

The team has also raised its profile by organising the WHSR workshop at the Humanoids conference.

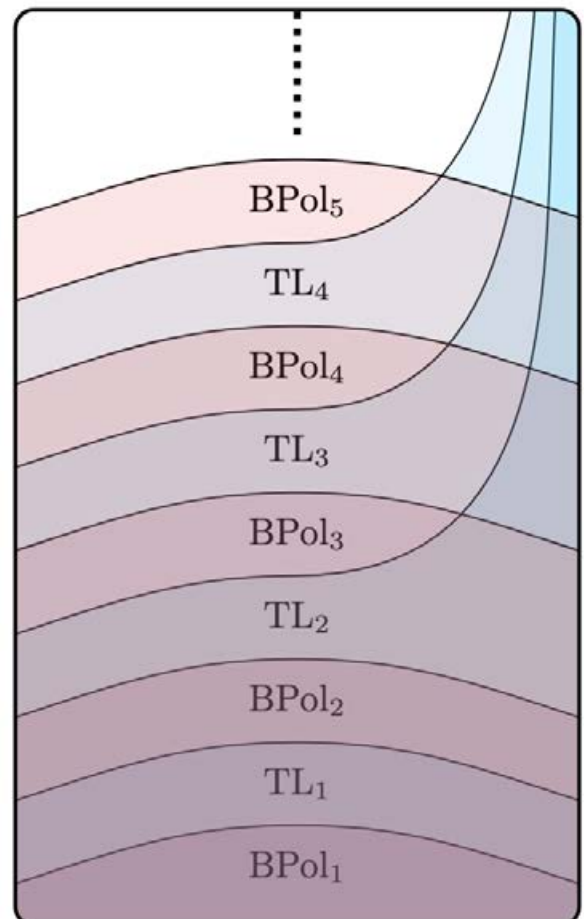
LX team

Something worth noting about theoretical computer science is that many computational models are defined in purely logical terms.

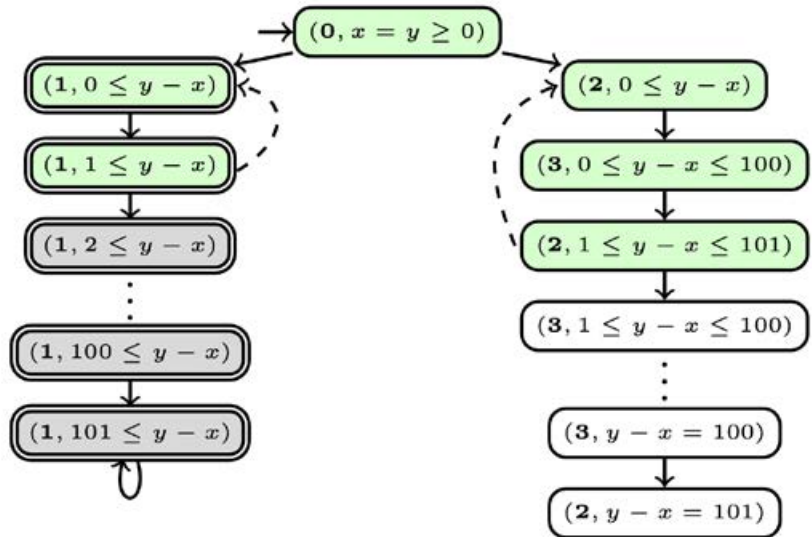
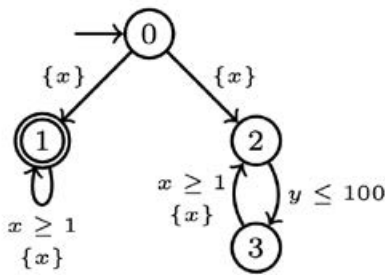
Thus, the expressiveness of automata computational power is the same as monadic second-order logic, while the existential formulas of Peano's arithmetic correspond to Turing machines. Such correspondence has far-reaching consequences. **We can study computational problems from a logical angle**, and conversely, **logic-based questions through the lens of computation**. The research led by the LX team falls within this in-between area.

KEY EVENTS

In 2025, the team published a dozen papers in leading journals (*Journal of the ACM*, *TheoretCS*, *Information and Computation*, *ToCL*) and conferences (CSL, AAAI, LICS, ICALP, FSTTCS). A senior lecturer and two post-doctoral researchers were recruited. Two PhD theses and one HDR (accreditation to supervise research) were successfully defended. In June, several members organised the international conference "Computability, Complexity and Randomness", which brought together around forty participants.



MTV team



MTV team members design **models and algorithms for the formal verification of systems and programmes.**

Our research covers theoretical issues such as decidability and the complexity of verification problems, as well as practical applications including developing verification tools and analysing biological processes. The team consists of 16 permanent researchers and 12 PhD students/post-doctoral researchers.

KEY EVENTS

A high standard of publications in recognised conferences and journals within the field was maintained. These include a paper presented at STOC, a prestigious conference in theoretical computer science, as well as a publication in the internationally acclaimed *Journal of Computer and System Sciences*.

The CoqPetri project received funding from the ANR to develop a semi-automatic proof in Rocq of the decidability of the control reachability problem in Petri nets.

Recruitment of Adélaïde Raguin as a CNRS junior professor chair (tenure track position) and Jean-Marc Talbot as a lecturer.

RATIO team

RATIO focuses on **reasoning** with data, **knowledge and constraints.**

The team works on reasoning applied to knowledge representation, description logic and ontology languages, automated reasoning, SAT resolution, constraint satisfaction problems, database theory, logic and automata on complex data, and incomplete and inconsistent information.

KEY EVENTS

In 2025, RATIO was active in both scientific and community-based initiatives.

The year saw the return of Meghyn Bienvenu from Japan, as well as several appearances on international programme committees, and invitations to give presentations.

The team's research has led to the publication of papers in leading conferences and journals (PODS, KR, IJCAI, LMCS, JAIR, AAAI), as well as two "Distinguished Paper Awards" at PODS.

RATIO co-organised two international scientific events (Complexity as a Kaleidoscope, Finite Model Theory 2025), attended the defence of two PhD theses and contributed to the launch of the EXPAND ANR project.



Y. Awuklu



M. Bienvenu



D. Figueira



J. Fijalkow



R. Jean



D. Kozhemiachenko



P. Lafourcade



S. Lombardy



S. Maabout



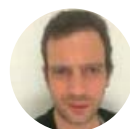
R. Morvan



V. Penelle



L. Simon



M. Zeitoun

SYNTHESE team

The Synthèse team, which is part of the Methods and Formal Models (M2F) department, focuses on the **automatic design of systems** which are “correct by construction”.

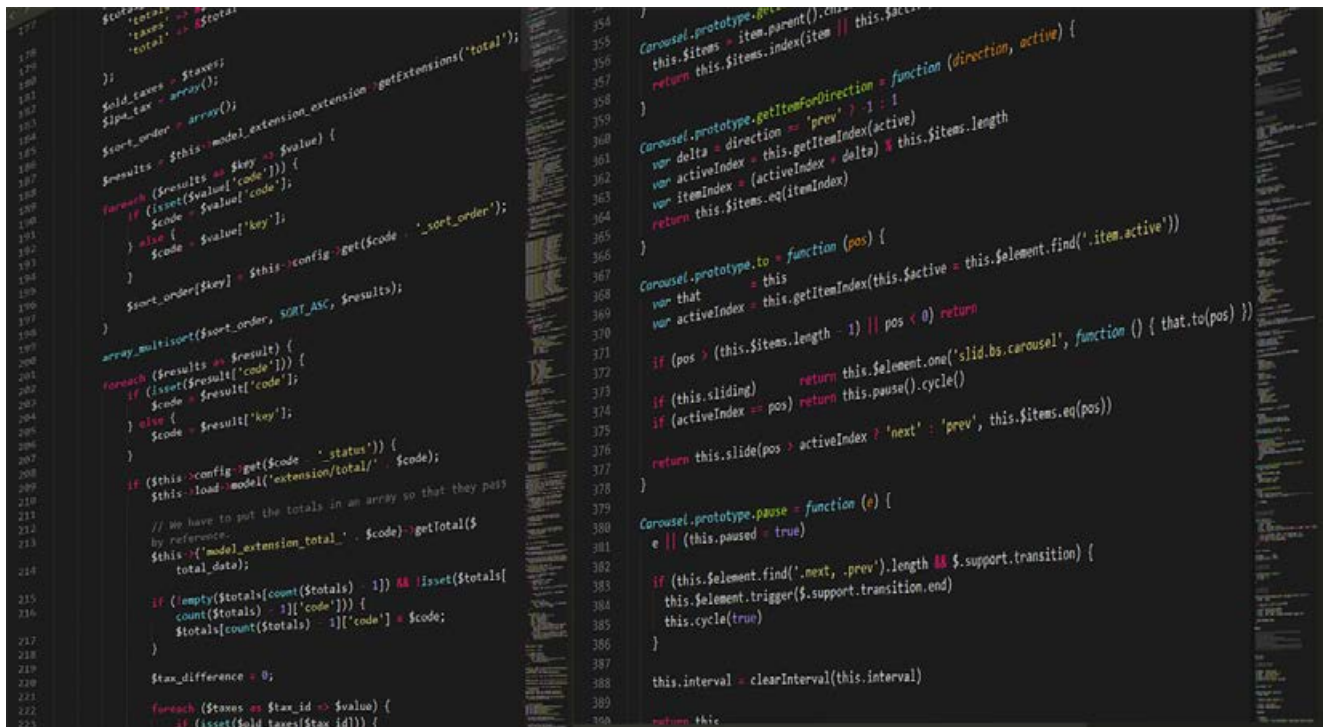
Our research draws on logic, automata theory and graph games to transform formal specifications into implementations that are guaranteed to be error-free. We tackle major challenges in distributed, reactive and time-delayed systems. By combining mathematical rigour with algorithmic expertise, the team automates the development of critical software, ensuring its reliability and absolute security.

KEY EVENTS

Our team received the “Outstanding Paper Award” at the AAAI 2025 conference for our work on optimal strategies related to imperfect information. This conference is the largest of its kind in the field of AI (with just 3 awards for 12,000 papers submitted and 3,000 accepted!)

Our scientific standing was further cemented by our co-organisation of a workshop on trustworthy AI at the Simons Institute in Berkeley.

These results consolidate our expertise in programme synthesis and strengthen our global collaborations, placing the team at the forefront of current challenges regarding the reliability of autonomous systems and AI.



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177 $total = $taxes + $total;
178 $taxes = $total;
179 $total = $total;
180
181 $old_tax = $taxes;
182 $tax = $taxes;
183
184 $sort_order = array();
185
186 $results = $this->model->extension->getExtensions('total');
187
188 foreach ($results as $key => $value) {
189     if (isset($value['code'])) {
190         $code = $value['code'];
191     } else {
192         $code = $value['key'];
193     }
194     $sort_order[$key] = $this->config->get($code . '_sort_order');
195 }
196
197 $sort_order[$key] = $this->config->get($code . '_sort_order');
198
199 array_multisort($sort_order, SORT_ASC, $results);
200
201 foreach ($results as $result) {
202     if (isset($result['code'])) {
203         $code = $result['code'];
204     } else {
205         $code = $result['key'];
206     }
207 }
208
209 if ($this->config->get($code . 'status')) {
210     $this->load->model('extension/total/' . $code);
211     // We have to put the totals in an array so that they pass
212     // by reference.
213     $this->('model_extension_total' . $code)->getTotal($
214         total_data);
215
216     if (empty($totals[count($totals) - 1]) && !isset($totals[
217         count($totals) - 1]['code'])) {
218         $totals[count($totals) - 1]['code'] = $code;
219     }
220
221     $tax_difference = 0;
222     foreach ($taxes as $tax_id => $value) {
223         if (isset($old_tax[$tax_id])) {
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SATANAS

Department



The SATANAS department contributes to the design and **development of robust, high-performance simulation tools** for hybrid and multicore exascale architectures. Solving these problems requires a multidisciplinary approach involving applied mathematics, scientific computing and information technology.

The department is developing skills in a variety of areas, including programming paradigms, sophisticated scheduling mechanisms and innovative digital methods for scientific applications with a strong societal and economic impact.

KEY EVENTS

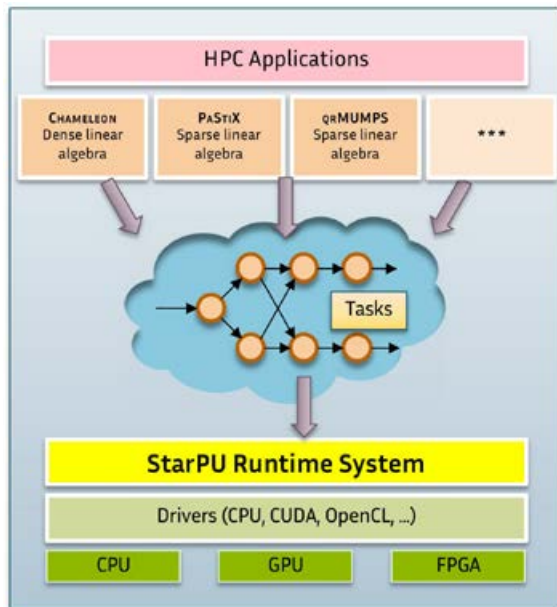
The COMPAS 2025 conference was held on the Bordeaux Bastide campus, bringing together the French-speaking community to discuss parallel computing, architecture and systems. This year's event had a high turnout, with over 150 participants (<https://2025.compas-conference.fr/>).

Together with all the teams in the SATANAS department, we are joining forces with Eviden on the flexible and portable rewriting of the HPL benchmark, which is used to evaluate the performance of supercomputers.



STORM team

STORM studies **the efficient application of supercomputers** through the development of execution supports (StarPU, StreamPU) and libraries (DUF, MIPP) to abstract hardware complexity, facilitate the expression of parallelism and optimise execution time and energy consumption. CORHPEX software explores performance optimisation spaces.



The StarPU execution support has been developed to dynamically schedule the tasks of intensive computing applications on heterogeneous computing platforms.

PARCOACH checks that parallel and distributed constructions are correct.

EasyPAP software supports the teaching of HPC programming techniques.

KEY EVENTS

The quality of the STORM team's work was recognised at the IPDPS conference with two major awards: Diane Orhan won the "Best Paper" award at the HCW workshop, while Lana Scravaglieri received the "Best Open-Source Contribution Award" for the CORHPEX software.

In addition, the STORM team is expanding with the arrival of Benjamin Nègrevergne in mid-September 2025 as part of a CNRS delegation. He will focus on optimising HPC code using AI techniques.

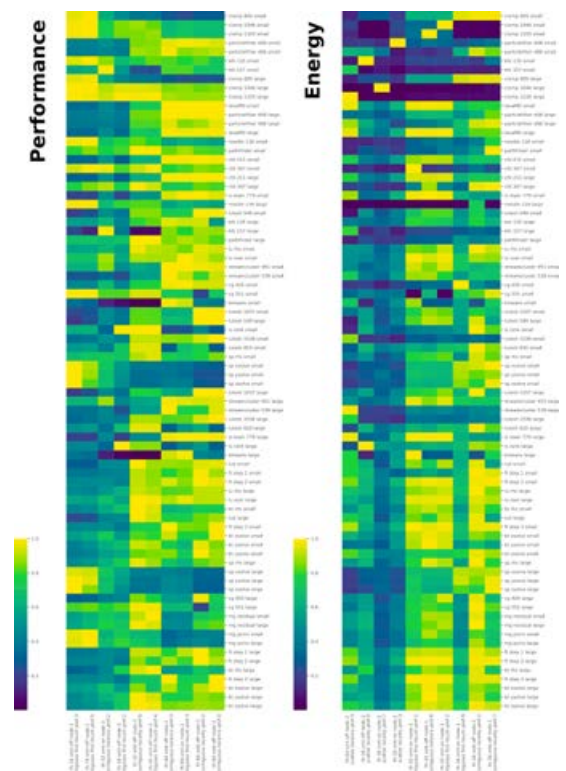
TADaaM team

The TADaaM team examines **data movements**. For calculations to be made quickly, the data must be in the right place at the right time. The team **models computing platforms and applications to understand how they interact**.

Then specifically designed scale-up algorithms dynamically allocate resources according to the needs reported by the applications. This research is implemented in internationally distributed software (hwloc, Scotch) and in international standards which we contribute to (MPI).

KEY EVENTS

The TADaaM team has made a name for itself with the release of the MPI 5.0 standard, co-edited by Guillaume Mercier, and their strong presence at IPDPS'25 (Milan), where they submitted four papers and two workshop presentations. At the same time, the Scotch Consortium is gaining momentum: the first official member has signed up, and further registrations are in the pipeline. Industrial and scientific developments are progressing according to schedule, driven by the consortium's engineer and supported by related projects.



© Mihail Popov et al.

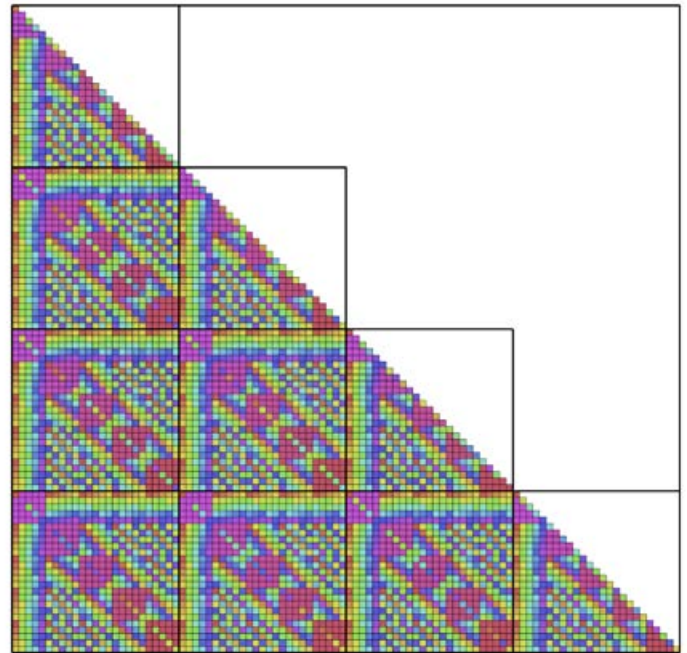
TOPAL team

The team's aim is to **build effective tools** to optimise the use of applications in high-performance computing platforms.

In particular, we focus on linear and tensor algebra applications and machine learning. To achieve these objectives, we are working on the following issues: using runtimes to manage the dynamic performance of resources, implementing compression to minimise memory footprints and data exchanges, and limiting energy consumption.

KEY EVENTS

The TOPAL team has been strengthened by the arrival of Thomas Hérault (Research Director at Inria), who will be leading a project on resilience, and Laércio Lima Pilla (Research Fellow at the CNRS), who will be contributing his expertise in federated learning. In addition, the team is actively increasing its industrial partnerships and expanding its network thanks to closer collaboration with the CEA and Eviden. Finally, the launch of ongoing discussions with key players such as Hive and Diablocor reflects the team's desire to diversify application areas.



The Triangular Block Cyclic distribution halves the number of communications required for symmetrical operations, compared with the standard Block-Cyclic distribution. Here is an example using 30 processors and a matrix of 100 tiles on a side. <https://www.labri.fr/actualites/prix-best-paper-conference-supercomputing-sc22>

©Lionel Eyraud-Dubois



SYSTEMS & DATA – SeD

Department



Two key aspects underlie the use of digital tools: the **IT systems** that govern their behaviour and **the data** they manipulate.

Our department focuses on these pillars to **simplify the implementation of tools**, improve their performance and reliability, offer easy interaction for users, and study their impact and uses to increase sustainability. Our research draws on interdisciplinary partnerships in fields such as autonomous drones, bioinformatics, digital health, IoT (the Internet of Things) and agronomy.

KEY EVENTS

From 8 to 11 July 2025, the SeD department held the 26th edition of the Open Days in Biology, Computer Science and Mathematics (JOBIM 2025), the leading French-speaking event in bioinformatics and biostatistics. The 14 guest speakers (6 international) were the highlights of the programme, comprising 45 oral presentations, 140 posters and 4 mini-symposia, one of which was co-hosted with the NeS team from the department dedicated to sustainability issues in bioinformatics. Organised mainly by the BKB team, the conference attracted over 500 participants on site and around 100 remotely.

BKB team

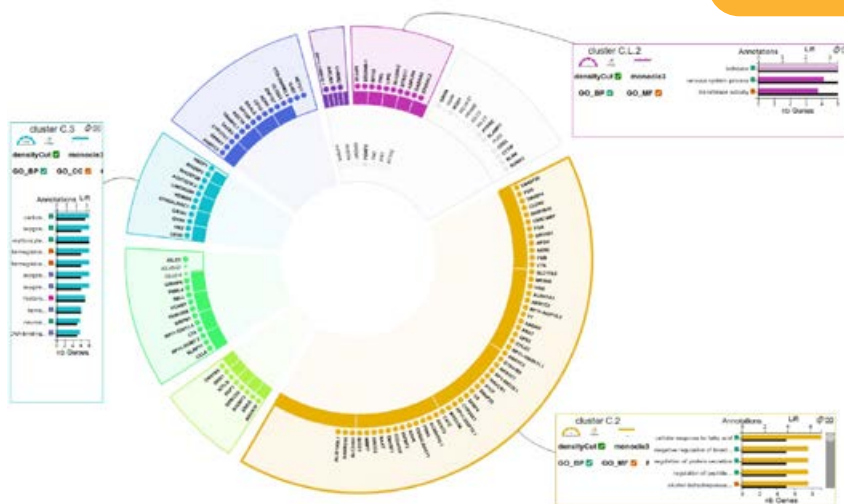
Advances in **data acquisition, storage and processing** have led to an explosion of data since the 2000s.

The BKB team focuses on the life cycle of this data, from production to visualisation, storage, modelling and analysis. Although our work aims to develop generic methodological tools, we mainly study real data and problems, in collaboration with experts in various fields. Our research is of particular benefit to biology and health, the humanities and social sciences, and explainable AI.

KEY EVENTS

BKB has received several awards. The article by Asloudj et al., published in the *NAR Genomics and Bioinformatics* international journal, received the "Editor's Choice" label. The literature review published in collaboration with Italian and American researchers in the *Computer Graphics Forum* journal received the "Top 10 Read" and "Top 10 Cited" prizes in 2025 for papers published in 2023.

The team played a major role in organising a special session at the IEEE International Conference on Content-Based Multimedia Indexing, as well as in hosting France's National Conference on Complex Systems (FRCCS).



An interactive pie chart providing an overview of the annotation results from single-cell clustering, generated by scEVE [Asloudj et al. NarGAB, 2025] and GORI [Asloudj et al., under preparation].

NeS team

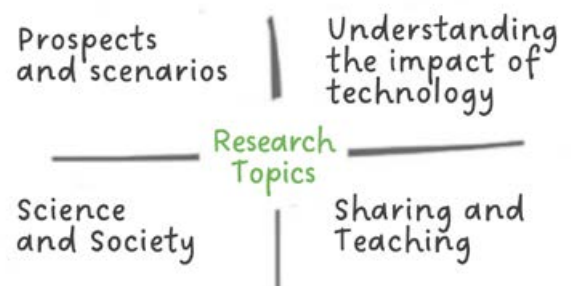
The aim of the NeS team (Digital Technology and Sustainability) is **to inform societal choices in terms of the environment**, resilience and social equity. It studies the use of digital technology to support the digital transition, the socio-environmental impacts of digital technology and how to teach about the

digital transition.

In particular, the team aims to propose and improve impact assessment methodologies. They address this issue by using appropriate mathematical models, dynamic simulations, scenarios, in-situ experiments and interactive exploration tools.

KEY EVENTS

The team has expanded with the appointment of Nicolas Herbaut as senior lecturer. Pierre La Rocca, Gaël Guennebaud and Aurélie Bugeau won the Best Paper Award at the ICT4S 2025 conference. The team members continued their outreach and advisory work, particularly with the organisation of 15 academic and public seminars, the creation and facilitation of workshops on environmental issues in research, education and the digital sector, a contribution to the Shift Project's report "AI, Data, Computing" and the scientific co-editing of the ENS Observatory on the Environmental Impact of AI.



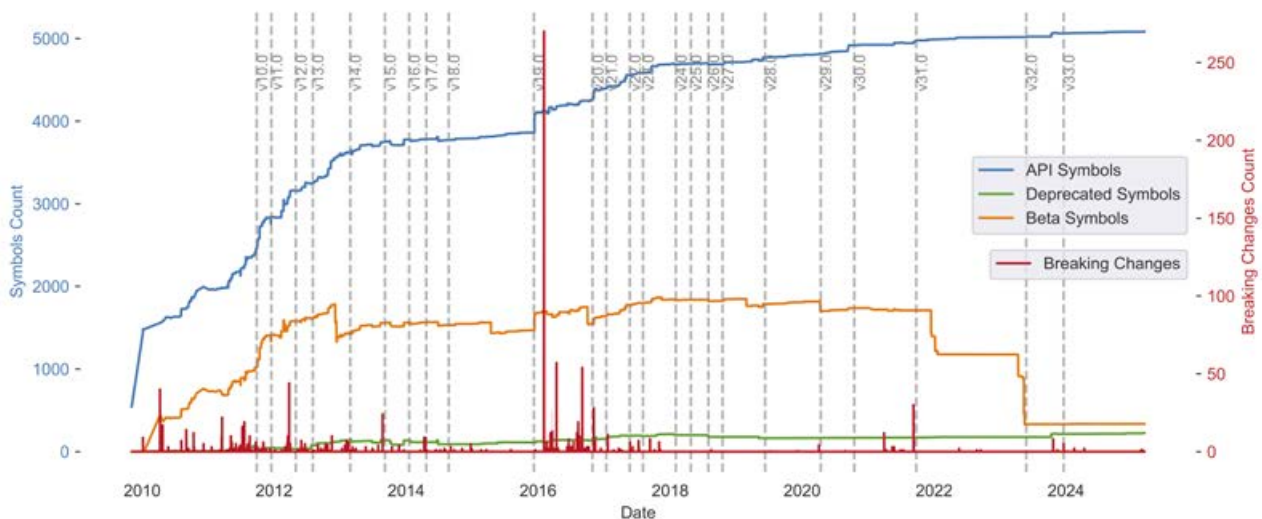
PROGRESS team

The Progress team is developing **software systems** operating in complex environments, with a specific focus on **code quality, performance optimisation and security**.

A noticeable feature of the Progress team is its commitment to implementing and evaluating systems under realistic conditions, as well as creating start-ups. The team covers application areas such as video streaming, e-commerce software, aerial surveillance systems and intelligent transport systems.

KEY EVENTS

Corentin Latappy, Thomas Degueule, Jean-Rémy Falleri, Romain Robbes and Lina Ochoa received a "Distinguished Paper Award" at ICSME 2025 for developing Roseau, a static analysis tool that automatically detects breaking changes between versions of a Java library. Roseau stands out for its precision and ability to quickly analyse very large codebases. Used in particular by the well-known JUnit testing framework, it makes it possible to track API changes and helps minimise the impact of these modifications on users.



RESEARCH SUPPORT – SaR

Department



Essential to the running of the laboratory, the SaR department (Research Support) comprises 20 staff divided into three teams, i.e. Administration, Finance, and Systems and Networks, as well as SCRIME.

Their mission is to ensure the **implementation of the laboratory's scientific policy** via the following:

- + Management of budgets and scientific credits,
- + Interfacing with external partners,
- + Reception of staff and visitors, particularly in accordance with ZRR (strict security regime area) procedures,
- + Management and administration of the laboratory's administrative resources,
- + Management and administration of the laboratory's IT resources,
- + IT support for research projects,
- + Management of internal and external communications, in line with the laboratory's scientific strategy.

KEY EVENTS

Faced with a constantly changing public research environment, the SaR department successfully adapts its range of administrative, financial and technical support services to provide professional and seamless assistance.



Magali
Hinnenberger

Director of the laboratory,
Member of the Management Board,
Head of the SaR Department
(until 30/11/2025)



Annick
Mersier

Her duties at SCRIME include the administrative, financial and logistical management of Art and Science projects. She supports the Platform's managers and users, facilitating their research and creative work, mediation activities and the organisation of events.

ADMINISTRATIVE TEAM

In accordance with the rules and procedures governing the ZRR (strict security regime area), as well as the requirements of the relevant supervisory bodies, the team's tasks are as follows:

- Welcoming new members (permanent and contractual staff, guests, interns),
- Managing FSD (Security Officer) requests, internship agreements and collaboration contracts,
- Updating information systems (Reseda, directory, mailing list, IDNUM),
- Recruiting contractual staff,
- Managing rooms, allocating offices, managing keys and badges,
- Internal and external communication.



Safia
Amsili



Auriane
Dantès



Claire
Douvier



Laurence
Pinosa



Cathy
Roubineau

FINANCE TEAM

LaBRI operates on financial resources attributed by its three supervisory bodies – CNRS, the University of Bordeaux and Bordeaux INP –, as well as its own funds and research contracts, representing a total budget of around €5 million per year. The team's role is to assist agents with all financial procedures and ensures that expenditure is in line with public accounting rules.

Constant changes to such rules and tool developments require managers to adapt their working methods and acquire new technical and professional skills.



Isabelle
Garcia



Chloé
Godard



Ophélie
Lacaule



Emmanuelle
Lesage



Elia
Meyre

SYSTEMS AND NETWORKS TEAM

The Systems and Networks team manages the administration, maintenance and development of the laboratory's information system.

Its line of work includes infrastructure administration, i.e. IT (rooms, networks, servers), equipment management, user support, web application development, IT security and support for researchers' experiments.



Michaël
Fontaine



Alexandre
Issouli



Pierre
Lacroix



Gabriel
Larrouy



Pascal
Ung

KEY EVENTS

- Laurence Pinosa joined the reception team in June 2025.
- 102 contract files, 98 interns, 104 guests and 166 FSD (Security Officer) files managed.
- 108 internship agreements signed, including 75 paid internships.
- 53 contractual staff recruited.
- Improvements made to the FASCIL application.
- 30 Year-10 work experience students welcomed via the University of Bordeaux CAP IA scheme.
- Procedure for welcoming interns in collaboration with the IT training unit.
- Use of tools such as the PREFACE interface (a tool facilitating the management of external staff), the procedure for the departure of laboratory staff, the "Best Practice" guide for welcoming interns. Creation of communication content on the laboratory's scientific activities.

KEY EVENTS

Staff changes:

Departure of Ophélie Lacaule, an administrator, following her success in the CNRS AI (assistant engineer) external competitive examination.

- In 2025, the finance team processed 1,075 assignments and 545 orders using 99 different funding sources.
- The team also managed the logistical and financial organisation of two selection committees, four symposiums and twenty thesis juries.
- We have implemented a system for digitalising the laboratory's financial documents.
- The team has created an "assignments" procedure, available on the LaBRI intranet.

KEY EVENTS

Staff changes:

Departure of Thimothé Gadéa and Mathieu Bectard.

Safety prevention measures:

A new threat has become a reality in addition to attacks launched from outside.

We have alerted users to the potential risk of data leaks arising from the use of consumer-facing large language models.

The principle of not disclosing confidential or personal data must remain a priority for all laboratory members.



Cross-cutting area

ARTIFICIAL INTELLIGENCE - AI

The LaBR.IA research group brings together around 50 researchers and PhD students specialising in AI, covering a range of applied topics (LLMs for software engineering, programme synthesis, HPC, AI in healthcare, data visualisation) and specific areas:

- **Processing incomplete data:** finding solutions to address the variable quality and reliability of data from multiple sources.
- **Explainability and developments in models:** Developing methods (for images or data), identifying the key factors that influence decisions, and then ensuring they are kept up to date.
- **Verifiability and trust in AI:** Exploring formal methods to ensure the reliability of models and decisions, including programme synthesis. In addition, automatically generating systems with specific constraints in order to improve the reliability of AI solutions.

KEY EVENTS

- 3 papers were presented at the AAAI 2025 conference, including one that won the "Outstanding Paper Award".
- One paper was accepted for the NeurIPS 2025 conference.
- 2 papers were presented at ICML 2025.
- The SIN department's first Artificial Intelligence Day took place at LaBRI, followed by the AI PhD Students' Days at the AI-SMART conference.
- Aurélie Bugeau was appointed co-scientific director of the Observatory on the Environmental Impact of AI.

List of primitives

```
$      : regexp
.      : regexp
[ ^ _ ]+ : string → regexp
[ ^ _ ]+$ : string → regexp → regexp
compose : regexp → regexp → regexp
split_fst : string → regexp → string
split_snd : string → regexp → string
```

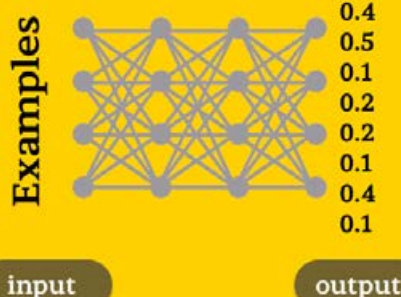
type request:
string → string

Compilation

Grammar

```
string → Split_fst(string, regexp)
string → Split_snd(string, regexp)
string → Var0
regexp → [ ^ _ ]+(string)
regexp → [ ^ _ ]+$(string, regexp)
regexp → Compose(regexp, regexp)
regexp → $
regexp → .
```

Prediction model



Prediction

Probabilistic Grammar

```
0.4: string → Split_fst(string, regexp)
0.5: string → Split_snd(string, regexp)
0.1: string → Var0
0.2: regexp → [ ^ _ ]+(string)
0.2: regexp → [ ^ _ ]+$(string, regexp)
0.1: regexp → Compose(regexp, regexp)
0.4: regexp → $
0.1: regexp → .
```

probabilities for
derivation rules

Cross-cutting area

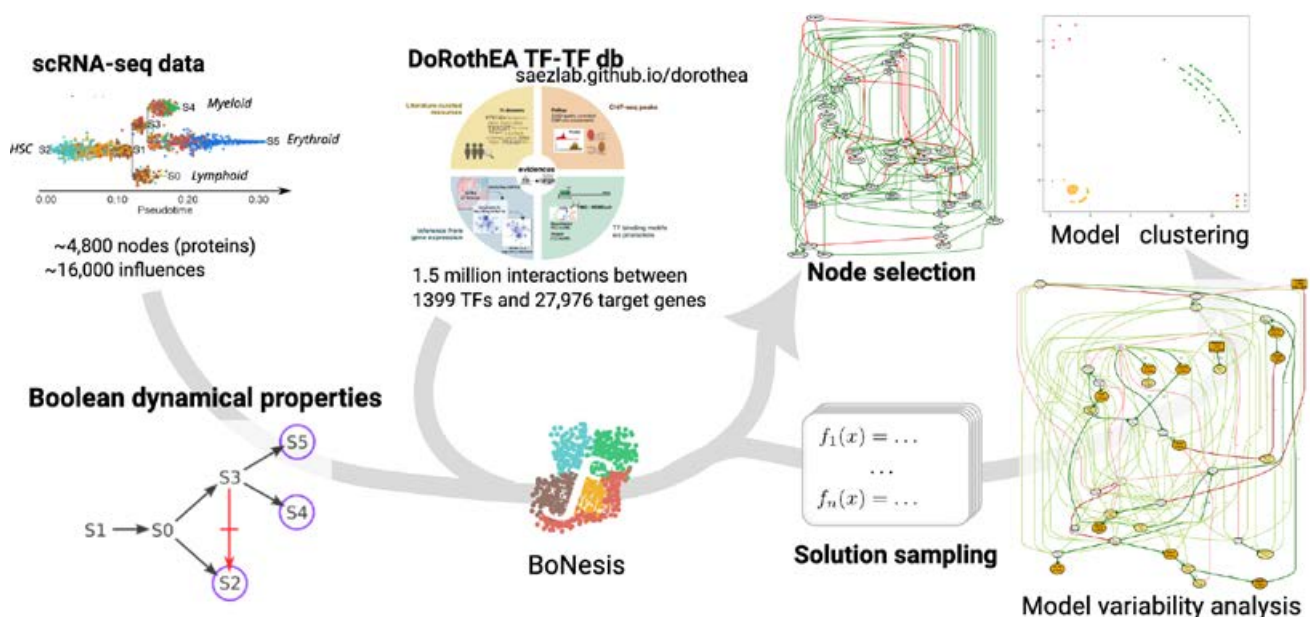
DIGITAL HEALTH – E-HEALTH

The aim of LaBRI's Digital Health research area is to **develop methodologies** to **diagnose** neurodegenerative diseases, **predict** markers and therapeutic targets, and **provide support** for disability, **rehabilitation** and **prevention**.

Such methods involve the analysis of medical images, multimodal and omics data, knowledge representation, modelling of dynamic systems, automatic learning and reasoning, stochastic simulation of cell models, and the design of new man-machine interfaces.

KEY EVENTS

- Participation in the organisation of the 26th edition of the Open Days in Biology, Computer Science and Mathematics (JOBIM 2025).
- Seminar on software developed within the Digital Health research area, with the participation of Aquitaine Science Transfert.
- 2nd "LABRIC" meeting: a morning of presentations and discussions on projects funded jointly by LaBRI and BRIC (Bordeaux Institute of Oncology).
- 7 seminars with guest speakers organised in 2025.
- 5 PhD theses defended in 2025.
- 4 new international, national and pre-maturation projects funded.





ENTREE AMPHI



CYBER RESILIENCE OF DIGITAL INFRASTRUCTURES

- Cybersecurity

Chair

The Cyber Resilience of Digital Infrastructures Chair is endorsed by ENSEIRB-MATMECA - Bordeaux INP in partnership with the University of Bordeaux and the Bordeaux University Foundation, with support from public and private partners such as Adacis, Advens, Beware Cyberlabs, CATIE, Synacktiv and Tehtris.

The Chair's mission is to **build and structure a network** of academic and business partners to work on **cyber resilience**, with four components:

- Producing knowledge and research for practical applications
- Developing a range of training courses in collaboration with professionals
- Leveraging the technology transfer from the public to the private sector
- Providing advice and expertise in the field of cyber resilience

KEY EVENTS

- Graduation ceremony for the 3rd ECIN D.E. (state-registered diploma) class (22 graduates).
- Submission of the application for RNCP Level 7 certification of the ECIN D.E.
- Cybersecurity training and awareness-raising initiatives (Landes Chamber of Commerce and Industry) with penetration testing tools, CTF and Zero Trust conference.
- Co-organisation of a Cyber Security Morning with Le Monde Informatique and a round-table discussion hosted by the Chair on AI Risks.
- Organisation of a CTF in collaboration with the Army, Gustave Eiffel High School and ENSEIRB-MATMECA.
- Participation in the 10th European Cyber Week, "Cybersecurity Chairs & PEPR".



TRUSTWORTHY ARTIFICIAL INTELLIGENCE - AI

Chair

The Trustworthy AI Chair, operated by the Bordeaux University Foundation, with Bordeaux INP and the University of Bordeaux in partnership with Kedge Business School, is led by Laurent Simon (LaBRI). The Chair aims to **develop trustworthy artificial intelligence** which is verified, ethical, explainable and responsible. It draws on multidisciplinary expertise and develops research, training and dissemination activities to promote the controlled roll-out of AI technologies in companies.

It is sponsored by Floa, AtHome Solutions, FieldBox, Guy Hoquet and CATIE.

KEY EVENTS

- Organisation of a student citizens' convention on AI in higher education, which brought together around 100 students in Bordeaux. This event led to a national recommendation on the use of AI in higher education.
- Interview with Laurent Simon in the special edition of Science et Vie on the theme "Where is AI heading?".
- An afternoon dedicated to the AI Act was held at ENSEIRB-MATMECA.
- The first cohort of the AI expert diploma course produced 17 graduates. The next cohort will begin in 2026.



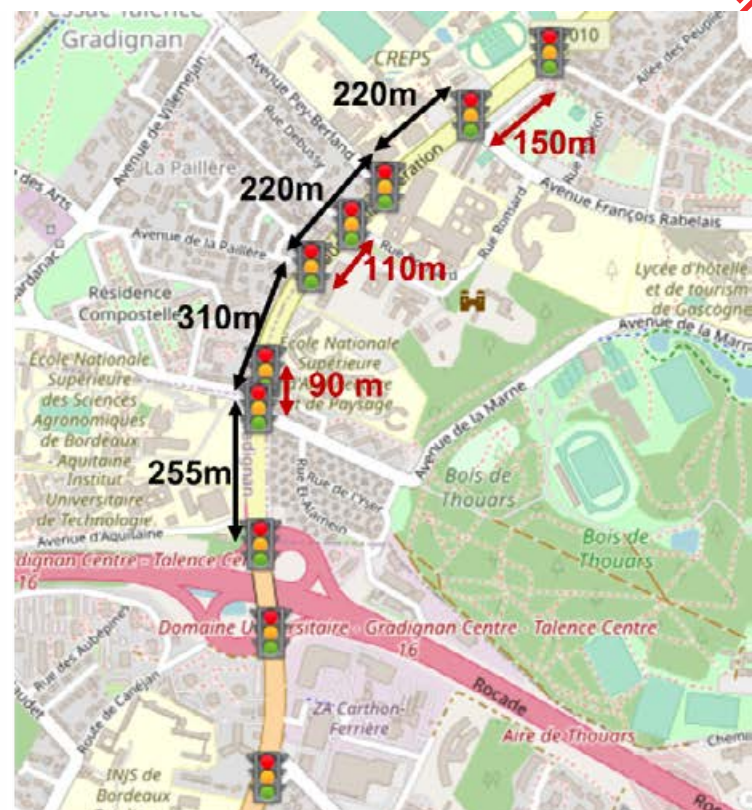
SMART TRANSPORT AND MOBILITY - MTI

The Smart Transport and Mobility (MTI) Chair, supported by Bordeaux INP and the University of Bordeaux, and backed by the Bordeaux University Foundation, conducts research, training and experiments dedicated to **cooperative intelligent transport systems**.

It aims to pave the way for more efficient and sustainable mobility by tackling major scientific challenges regarding communications, data, perception, artificial intelligence and security. Supported by nine industrial and institutional sponsors, the MTI Chair is at the heart of the technological and societal issues facing the mobility of the future.

KEY EVENTS

- Launch of a CIFRE PhD project with Keolis (Lab TBMouv!) on the resilience of transport systems in light of climate-related hazards (January 2025).
- Defence of Mayssa Dardour's thesis (May 2025) on the development of a digital infrastructure for level crossing safety.
- Conducting a vehicle count campaign on campus (November 2025) to analyse traffic flows.
- Facilitating working groups tasked with preparing a site for testing and certifying C-ITS technologies on campus, as part of the SCALE project.





LABRI



NEW ARRIVALS



Charles Brazier - Senior Lecturer

Charles joined the TAD team in the I&S department in September 2025. His research focuses on the classification of speech styles, audio-score alignment and the use of attention mechanisms in acoustic models.



Nicolas Herbaut - Senior Lecturer

As part of the NeS team (SeD department), Nicolas works on digital sustainability and assessing the environmental footprint of information systems. His research focuses on ubiquitous AI and the conditions for its roll-out on a finite planet, through socio-technical modelling of infrastructure and usage patterns. He also develops methods and tools for digital frugality.



Aliaume Lopez - Senior Lecturer

Aliaume Lopez has just joined the M2F department as part of the LX team. His research in theoretical computer science draws on logic and topology to construct, verify and transform programmes. As part of this, he studies automata and transducers, performs calculations using polynomials, and works with ordinals.



Laurence Pinosa - BIATS Bordeaux INP

Laurence is taking over from Laurie Dantas. She works at reception, alongside Claire Duvier, as part of the SaR department's administrative team.



LaBRI

Mission

COMMUNICATION

"Communicating is all about sharing, and sharing is the very action that defines us."

- Albert Jacquard

- Coordinating and/or designing various internal and/or external communication tools.
- Organising recurring and/or one-off events.
- Collecting and publishing information via various communication channels: website, newsletter, Bluesky account, reception desk TV.



KEY EVENTS

- Creation and facilitation of a working group for the drafting and publication of a welcome booklet
- Update of the annual edition of the LaBRI presentation brochure
- Preparation and publication of LaBRI's calls for projects booklet + highlights on the website + new arrivals
- Production and distribution of various posters
- Coordination of the Fête de la Science (science festival)
- Organisation of LABRI's two Annual General Assembly Meetings, including surprises at the end
- Logistical organisation of symposiums and events

Contact

communication@labri.fr ou
auriane.dantes@labri.fr

Supervisor

Auriane Dantès

.....

Mission

STRUCTURING PROJECTS, INNOVATION AND TRANSFER - PSIT



Contact
psit@labri.fr

Composition of the committee

Project coordinator:
Serge Chaumette
Committee members:
Nadine Couture,
Cyril Gavoille,
Raymond Namyst,
Laurent Simon

This mission covers LaBRI's structuring projects, which are characterised by their scale, complexity or innovative nature, and involve supervisory bodies, businesses and other socioeconomic stakeholders. It aims to support and strengthen the transfer of expertise, and build relationships within the sector, while feeding back tangible issues to LaBRI. These objectives are in line with the supervisory bodies' leveraging roadmaps. The key words are **visibility** (to identify valuable potential for promoting LaBRI's research), **and fluidity** (by facilitating the adoption of mechanisms and procedures related to leveraging the technology transfer). This includes assistance with compiling the necessary paperwork.

KEY EVENTS

Since its establishment, the committee has:

- Put LaBRI researchers in touch with major corporations (Siemens, Ariane Group, Lectra Systems, Thales) and SMEs.
- Brought together the start-ups emerging from the laboratory through meetings and a newsletter, and created a "LaBRI Friendly" label. Raised awareness among LaBRI members of intellectual property

issues in computer science, and maintained regular contact with SATT Nouvelle-Aquitaine, the business incubators in Bordeaux and the supervisory bodies responsible for the technology transfer and industrial relations.

- Recently forged closer ties with the military and organised a dedicated event.
- Developed strong links with the Technowest incubator, benefiting several teams within the laboratory.

THÈSE

présentée à

UNIVERSITÉ DE BORDEAUX I

pour obtenir le grade de

DOCTEUR D'ÉTAT ÈS SCIENCES

SPECIFIC ACTIONS

Here are some of the major initiatives undertaken by the laboratory **to improve quality of life, support change** and successfully carry out the **ecological, environmental and societal transition**.



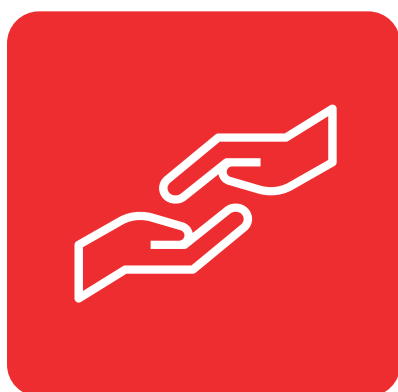
KEY EVENTS

Actions supporting gender equality:

- Continuation of the mentoring programme based on the model of previous years, as well as single-sex meals.
- Organisation of the "Moi Informaticienne, Moi Mathématicienne" programme for secondary school girls (72 interns accepted) with the IMB.



AFoDIB



The Association de la Formation Doctorale d'Informatique de Bordeaux (AFoDIB) supports the **integration and training of PhD students in computer science in Bordeaux**. Throughout the year, it organises events to foster exchanges between PhD students, post-doctoral researchers and members of LaBRI and Inria Bordeaux, regardless of their field of research. By joining the association (annual membership fee of €5), everyone can take part in the many activities on offer and help boost the local scientific community.

KEY EVENTS

Once again this year, AFoDIB has organised a wide range of activities to help new and existing PhD students, post-doctoral researchers, research and teaching fellows and interns integrate within the company. By combining fun and sciences, the association strives to foster a friendly atmosphere within the laboratory and bring the PhD community to life.

Contact

labri.afodib@diff.u-bordeaux.fr

Composition of the committee

Chair:

Arthur Léonard

Vice-Chair:

Juliette Schabanel

Treasurer:

Françoise Metuekam

Vice-Treasurer:

Juliette Giraudon

Secretary:

Oscar Fontaine



SCRIME

The Studio de Création et Recherche en Informatique et Musiques Expérimentales (Studio for Creation and Research in Computer Science and Experimental Music) conducts scientific research aimed at **enhancing how music is experienced** in its various dimensions including **listening, performance, composition, analysis and learning**. A large part of our work covers music informatics, particularly related to artificial intelligence. Our research is promoted through projects bringing together scientists and artists, as well as mediation and educational initiatives intended for the music community and the general public.

KEY EVENTS

Design of an interactive musical staircase for Heritage Days in collaboration with the Bordeaux National Opera.

Organisation of a travelling exhibition on the theme of "Music and AI" in collaboration with L'Inconnue music school.

Organisation of educational activities (on the theme of art and culture) in three schools in the Bordeaux area.



Contact

louis.bigo@labri.fr and/or
annick.mersier@labri.fr

Supervisor

Louis Bigo

Assistant

Annick Mersier





LaBRI

LaBRI



LABRI

LABRI

GLOSSARY

HPAA: Algorithmes et Applications Haute Performance (High-performance algorithms and applications)

AD: Algorithmique Distribuée (Distributed algorithm)

AFoDIB: Association de la Formation Doctorale d'Informatique de Bordeaux (Bordeaux Computer Science PhD Training Association)

ANR: Agence Nationale de la Recherche (French National Research Agency)

BIATSS: Bibliothèques, Ingénieurs, Administratifs, Techniques, Sociaux et Santé (Library, Engineering, Administrative, Technical, Social and Health staff)

BKB: Bench to Knowledge and Beyond

CHU: Centre Hospitalier Universitaire (University hospital)

CI: Combinatoire et Interactions (Combinatorics and interactions)

CNRS: Centre National de la Recherche Scientifique (French National Centre for Scientific Research)

CombAlgo: Combinatoire et Algorithme (Combinatorics and algorithms)

CR: Chargé de Recherche (Research fellow)

DART: Décision et Apprentissage : de la théorie aux applications robotiques (Decision-making and learning: from theory to robotic applications)

DR: Directeur de Recherche (Research director)

EEG: Electroencephalography

GdR: Groupements de Recherche (Research groups)

GIS: Groupement d'Intérêt Scientifique (Scientific interest group)

GO: Graphes et Optimisation (Graphs and optimisation)

WG: Working group

HPC: High Performance Computing

I&S: Image et Son (Image and Sound)

AI: Artificial Intelligence

IDNUM: Digital ID card (University of Bordeaux)

IHU: Institut Hospitalo-Universitaire (Hospital-University Institute)

RHU: Recherche Hospitalo-Universitaire en santé (Hospital-University Research in Health)

Inria: Institut National de Recherche en Sciences et technologies du numérique (National Institute for Research in Digital Science and Technology)

MRI: Magnetic Resonance Imaging

ITA: Ingénieur, Technicien, Administratif (Engineer, Technician, Administrative staff)

IUF: Institut Universitaire de France (Academic Institute of France)

LaBRI: Laboratoire Bordelais de Recherche en Informatique (Informatics Research Bordeaux Laboratory)

LX: Logical foundations of computing

M2F : Méthodes et Modèles Formels (Formal models and methods)

MANIOC:

MCF: Maître de conférences (Associate professor)

MTI: Mobilité et Transports Intelligents (Smart Transport and Mobility)

MTV: Modèles et Technologies pour la Vérification (Models and Technologies for Verification)

PEPR: Programme et Equipements Prioritaires de Recherche (Priority Research Programme and Equipment)

PR: Professor

Progress: Programmation, réseaux et systèmes (Programming, systems and networks)

PSIT: Projets Structurants, Innovation et Transfert (Structuring Projects, Innovation and Transfer)

AR: Augmented Reality

RATIO: Raisonnement sur les données, les connaissances et les contraintes (Reasoning with data, knowledge and constraints)

Reseda: Reference tool for CNRS staff and organisations

Robocup: World football championship for robots

VR: Virtual Reality

SaR: Soutien à la Recherche (Research support)

SAT: Boolean satisfiability problem

SATANAS: Supports et AlgoriThmes pour les Applications Numériques hAutes performances (Supports and algorithms for high-performance digital applications)

SCRIME: Studio de Création et de Recherche en Informatique et Musiques Expérimentales (Studio for Creation and Research in Computer Science and Experimental Music)

SeD: Systèmes et Données (Systems and Data)

SEHP: High-performance executive supports

e-Health: Digital health

SR: Soutien à la Recherche (Research Support)

TAD: Traitement et Analyse de Données (Data processing and analysis)

UMR: Unité Mixte de Recherche (joint research unit)

ZRR: Zone à Régime Restrictif (strict security regime area)

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