

National Projects with Partners

R&D Projects with Industries

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ASCP Team

OpenCMS (Connected Environment & Distributed Energy Data Management Solutions) Industrial Chair

The OpenCEMS chair aims to provide concrete solutions to the collection of massive data in a connected environment and / or electrical networks. Its objectives are:

- 1 . in **scientific** terms: to design, implement and deploy software solutions at small and large scales in order to better collect/aggregate data, produce information, discover knowledge and automate (all or part of) decision making;
- 2 . in terms of **training**: to share best practices; the chair is a place for brainstorming, sharing, awareness and training;
- 3 . in terms of **transfer**: to address the challenges of companies and communities by offering advice and solutions, particularly in terms of data management and analysis;
- 4 . from a **strategic** point of view: to develop an open software platform capable of evolving and optimizing the operation of connected environments.

* **Partners:** LIUPPA; Bertin Technologies, Elqano, UPPA / E2S, Communauté d'Agglomération du Pays Basque, Région Nouvelle-Aquitaine

* **Duration:** 5 years

- * **Budget:** 1 722 601 €.
- * **Project leader:** Richard Chbeir

Financing:

- * Bertin Technologies: 160 000 - 5 years
- * CAPB: 383 000€ - 5 years
- * CRNA: 449 000€ - 5 years
- * E2S UPPA: 630 601€ - 5 years
- * Elqano: 100 000€ - 5 years

Project: QoS in satellite traffic

Study on the use of DPI (Deep Packet Inspection) techniques for the classification of applications in QoS management for satellite networks. Use of Machine Learning techniques for the classification of secure traffic.

- * **Partners:** LIUPPA, CNES, THALES
- * **Duration:** 5 years
- * **Budget:** €210,000
- * **Project leader:** Ernesto Exposito

Financing :

- * CNES 2015 call for tenders - CNRS DR15 / THALES ALENIA SPACE FRANCE / UPPA - 25 000€ - 1 year
- * THALES ALENIA SPACE France - 25 000€ - 1 year
- * THALES COM-SEC - 25 000€ - 1 year
- * THALES ALENIA SPACE FRANCE - 135 000€ - 3 years

Project: Design of Cyber-Physical Cognitive Systems for Agriculture 4.0

Study of methodologies, models, and architectures to **design and develop cognitive cyber-physical systems** (CPS) for Agriculture 4.0. This project will take as a framework the business processes of the Maisadour Company (energy management, quality, maintenance, transport...). The expected results will concern a methodology and a modeling framework adapted for the CPS and for the cognitive processes as well as a **cloud** integration platform. The major challenges are to take into account the heterogeneity of actors and to satisfy non-functional properties (performance, scaling and security).

- * **Duration:** 3 years
- * **Partners:** LIUPPA / Maisadour
- * **Budget:** 35 000 €.
- * **Project leader:** Ernesto Exposito
- * **Funding:** Maisadour: 35 000€ - 3 years

Project: 6FOOD: Innovative technology for the optimization of fish weight in fish farming

Technological transfer project of image processing skills, to evaluate the weight of fish in fish farming from photographic images. Development of the shooting process + processing software. Financing of one year of maturation engineer.

- * **Duration** : 1 year
- * **Partners** : LIUPPA, AST Aquitaine (transfer unit)
- * **Budget**: 92 052 €.
- * **Project leader**: Laurent Gallon
- * **Financing**: AST Aquitaine - 92 052€ - 1 year

Project: SIBEX: Intelligent Solutions for Buildings in Operation

The SIBEX project aims to 1) explore new approaches to building measurements (other than those currently used: energy/comfort/usage) that will reduce the time of data acquisition (rapid monitoring) or access to new data to enrich the knowledge of the building (NDT, infrared thermography ...), and 2) develop new tools and methods of data processing to deepen the analysis of data and enrich the exploitation that can be done. The work carried out (outside of buildings) on Big Data and business intelligence can be transposed to buildings. The application of inverse models is also an important lever for disruption in data analysis practices and energy audits.

- * **Partners**: LIUPPA, Nobatek, I2M, Fahrenheit Cell
- * **Duration**: 3 years
- * **Budget**: 53 000 €.
- * **Project leader**: Richard Chbeir
- * **Funding**: SIBEX (ANR AGEN_ITE INEF4) - 53 000€ - 3 years

Project: TORNADO: Formal approach to generate and reduce vehicle safety use cases

Design and development of a cyber-physical system (infrastructure and autonomous vehicles) to improve transport services in peri-urban and rural areas, with the implementation of a living lab in the city of Rambouillet.

- * **Partners**: LIUPPA, UPPA / Renault France
- * **Duration**: 4 years
- * **Budget**: €140,523
- * **Project leader**: Ernesto Exposito

Financing:

- * RENAULT FRANCE SAS (Cifre) - 46 000€ - 3 years

- * TORNADO (OSEO/ANVAR_FUI) - 84 523€ - 3 years
- * REGIENOV - 10 000€ - 1 year

Project: PIA2 E-FRAN Perseverance: Detection of school perseverance using computer tools

The project has two objectives: (i) to implement and deploy educational robotics kits in schools, colleges and high schools in the Landes region, in order to measure the impact of the use of educational robotics on school retention (ii) to develop and qualify a tool for detecting school dropouts in real time when using computer software (T. Duron's thesis).

- * **Partners:** LIUPPA, IMS Bordeaux, INSPE (leader), Rectorat Aquitaine, CD40, INRIA Bordeaux
- * **Duration:** 4 years
- * **Budget:** 149 300 €.
- * **Project leader:** Laurent Gallon

Financing :

- * PERSEVERONS (PIA2 E-FRAN) - 107 000€ - 4 years
- * Conseil Départemental des Landes - 42 300€ - 3 years

Project: University 4.0: Design of a generic framework based on knowledge representation models for the autonomic management of learning processes in University 4.0

Information technologies represented by the Internet of Things and Services, Cloud Computing and Big Data, can also be applied to educational organizations. They enable the tracking of learners to personalize the learning process, as well as assisting learners in anticipating intervention needs. Solutions such as learning analytics allow the monitoring and analysis of the learner's progress, as well as the prediction and prescription of actions to ensure the quality of teaching. In this project (thesis) we propose the design of a generic framework for the development of scalable, maintainable, dynamic knowledge bases based on semantic web technologies. We will base our work on ontologies that allow the collection and structuring of information about teaching activities, and that facilitate the decision making of autonomic learning processes.

- * **Duration:** 3 years
- * **Partners:** LIUPPA, CD40
- * **Budget:** 89280 €.
- * **Project leader:** Ernesto Exposito
- * **Funding:** CD40 - 89 280€ - 3 years

Project: PLASSMA: A Simulation Platform based on Multi-Agent Systems: application to University 4.0 and computer security

This project aims at setting up a simulation platform based on multi-agent systems, allowing the development of prototypes and demonstrators of the research work of the LIUPPA research team in Montpellier, both in the field of computer security and in that of University 4.0. The platform will be integrated into the new Very High Speed Technology Hall, in order to facilitate exchanges with industrial partners and to validate joint work.

- * **Duration:** 1 year
- * **Partners:** LIUPPA / Marsan Agglomeration
- * **Budget:** 31 500 €.
- * **Project leader:** Laurent Gallon
- * **Financing:** Le Marsan Agglomération - 31 500€ - 1 year

Project: Capture and propagate contextual green software data in cyber-physical environments

The PhD project aims to better understand the factors affecting energy consumption across different layers in a computing environment, and use this knowledge to apply autonomous adaptations and reconfigurations. The context of the work combines software engineering and cyber-physical systems as the aim is to address energy across software, computers, virtual environments and servers, equipment and physical devices and objects.

- * **Duration:** 3 years
- * **Partners:** LIUPPA
- * **Budget:** 64 000 €.
- * **Project leader:** Adel Nourredine
- * **Funding:** E2S Scientific Challenges - 64 000€ - 3 years

E2S UPPA Scientific Challenge: BISE² Business Information System for Energy and Environment solutions

The **BISE² project** aims at proposing a generic customizable Business Information System with rich multimedia services for data indexing, storage, enrichment, security and presentation for several domains, and in particular for Energy and Environment projects. This project will combine theoretical research areas related to multimedia cloud, megadata, data modeling and reasoning, information retrieval, and the semantic web (e.g., linked data and ontologies), with concrete application developments with industry and public institutions.

- * **Duration:** 3 years
- * **Participants :** LIUPPA: Richard Chbeir, Sébastien Laborie, Christian Sallaberry
- * **Budget:** 521 100 €.

- * **Project leader:** Richard Chbeir

Financing :

- * E2S Scientific Challenges - 496 100€ - 3 years
- * Bertin Technologies - Budget = 40 000€ - 5 years
- * Bertin Technologies - Budget = 40 000€ - 3 years

BISE² project 

Project : MEdIATE : Modeling in Computer Science Education

The idea of the project is to design a software platform to help students learn modeling concepts. This environment will also provide support to teachers in designing lessons and lesson plans for teaching modeling concepts. The platform will be defined using Model Driven Engineering (MDE) principles, such as meta-modeling, process modeling and enactment, code generation. The environment will be tested in middle school classes in the French department of Landes. The results obtained will also form the basis for offering additional support on architectural design modeling at all levels of expertise. A close collaboration with the Lab-E3D, Didactics, of the University of Bordeaux is expected.

- * **Duration:** 3 years
- * **Partners:** LIUPPA / CD40
- * **Budget:** 89 280€.
- * **Project leader:** Philippe Aniorté
- * **Funding:** CD40 - 89 280€ - 3 years

Project: Preservation of privacy in the internet of things made of cyber-physical sensors

In this work, we aim to empower users to protect their privacy by themselves. That is, users should be enabled, before sharing a private data item (or a combination of data items) with a data consumer to: 1) Understand the privacy risks involved in that sharing; 2) Assess the value of the data to be shared, based on the identified privacy risks, and compare it to the potential benefits generated by the sharing; 3) Negotiate with data consumers to attain a (trade-off) data sharing decision satisfying both parties when conflicts occur; and 4) Control the data release by applying the necessary data modification techniques (e.g., anonymization, data perturbation, modification, etc.) to implement the attained sharing decision.

- * **Duration:** 3 years
- * **Partners:** LIUPPA, CAPB
- * **Budget:** 90 000 €.
- * **Project leader:** Richard Chbeir
- * **Funding:** CAPB - 90 000€ - 3 years

Project: Emulation/Simulation of Smart Energy System Architecture

The recent development of sensor networks, data management/communication technologies and connected environments has led to the emergence of applications that help users in their daily tasks (increase productivity in a factory, reduce energy consumption). However, various improvements are still needed. We focus on four main challenges: (i) representing a diverse set of components and elements related to the environment and its sensor network; (ii) providing a query language that handles user/connected environment interactions (for environment definition, data management, event definition); (iii) dealing with the dynamics of the environment and its evolution over time; and (iv) proposing a generic event detection mechanism to better monitor the environment. To do so, we propose a data ontology for hybrid environments and sensor networks. We define a query language and a query optimizer to handle the dynamics of the environment before their execution. Finally, we propose a targeted event detection kernel. These modules constitute a global framework for event detection in connected environments.

- * **Duration:** 3 years
- * **Partners:** LIUPPA, CD40
- * **Budget:** 84 600 €.
- * **Project leader:** Richard Chbeir
- * **Funding:** CD40 - 84 600€ - 3 years

Project: SETIS: Smart Energy, Image Processing and Security

The objective of the request is to propose a development engineer to support the projects currently in progress in the Montpellier team attached to LIUPPA. In particular, four axes will be studied: (i) the OSVA project in relation with the Aquinetic cluster and the Marsan Agglomeration (ii) the "services, security and trust" project, to help prototyping of models developed by our team (iii) image processing, in support of the various projects between LIUPPA and SIAME-IVS (iv) finally, the finalization of prototypes under development in the Montoise team, especially regarding attack graphs and security modeling. The project includes the financing of an engineer position.

- * **Duration:** 1 year
- * **Partners:** LIUPPA / Agglomeration of Marsan
- * **Budget:** 30 000 €.
- * **Project leader:** Laurent Gallon
- * **Financing:** Le Marsan Agglomération- 30 000€ - 1 year

Project: Data Modeling & Optimal Energy Management in Smart Energy Environments

The main goal relies on conceiving and developing a new energy management platform that takes into account new issues /criteria as security and resilience and applying the topic to the

two real study cases abovementioned in order the local companies and institutions benefit from the research results of UPPA and UPV/EHU

- * **Duration:** 3 years
- * **Partners:** LIUPPA, UPV
- * **Budget:** 45 000 €.
- * **Project leader:** Richard Chbeir
- * **Funding:** Cotutelles UPPA - UPV - 45 000€ - 3 years

MOVIES Team

PERSEVERONS project: “Training, research and digital animation spaces” (2016-2020)

- * **Description:** investigate the impact of digital technology (including programming) on the perseverance of pupils in primary and high school.
- * **Members:** Laurent Gallon, Vanéa Chiprianov.
- * **Total budget:** €2 M, for the lab: €112 k.
- * **Results obtained:**
- * <http://perseverons.iutmdm.fr/>

ASAWoO project (2014-2018):

- * **Type:** ANR (French national research agency).
- * **Description:** the objective of the ASAWoO project is to optimize the web integration of applications. The aim of our project is to build an architecture to offer users user-friendly functionalities in the form of WoT applications, while enabling collaboration between heterogeneous physical objects, from basic sensors to complex robots.
- * **Members:** Michael Mrissa.
- * **Total budget:** €700 k.
- * **Results obtained:** see publications
- * <http://liris.cnrs.fr/asawoo/>

T2I team

Industrial project: FUI Tornado

- * Autonomous vehicle interactions and infrastructure for mobility services in sparsely populated areas
- * **2017-2020**
- * **Partners:** the LIUPPA

Industrial project

- * Autonomic Semantic Mediation for Safety Guarantee of Autonomous Vehicles
- * **2017-2018**
- * **Partners:** the LIUPPA, Renault

Industrial project

- * Classification Techniques for QoS Network Management
- * **2016-2019**
- * **Partners:** the LIUPPA, Thales

UPPA project: Sibex

- * Smart solutions for buildings
- * **2016-2018**
- * **Partners:** the LIUPPA, NOBATEK/INEF4, I2M

Industrial project: NOBASEARCH

- * Management of the business data of a document center - Analysis, classification and semantic enhancement of heterogeneous data collections applied to the building sector
- * **2015-2018**
- * **Partners:** the LIUPPA, NOBATEK

Project of the Basque Coast-Adour conurbation: e-Tourism

- * Emergence of a new research theme focused on tourism and ICT
- * **2017-2017**
- * **Partner:** the LIUPPA

Industrial project: CommSec

- * Machine Learning Classification Techniques for Secured Communications
- * **2016-2017**
- * **Partners:** the LIUPPA, Thales, CNES, Tésa, OneAccess

Industrial project: DPI

- * Semantic Driven mechanisms based on DPI (Deep Packet Inspection)
- * **2016-2017**
- * **Partners:** the LIUPPA, Thales, CNES, Viveris

Aquitaine regional council project: COGNISEARCH

- * Service development platform to search for business and events entities based on spatial, temporal and thematic criteria
- * **2014-2017**
- * **Partners:** the LIUPPA, COGNITEEV

CNRS project: TERREISTEX

- * Exploration of scientific publication collections according to geographic parameters
- * **2016-2017**
- * **Partners:** the LIUPPA and Geriico laboratories, the research unit Tetis and the ANRT (French national association of research and technology) (Lille)

ANR project: ORPHEE

- * **2014-2017**
- * **Led by:** S. Garlatti, Telecom Bretagne
- * **Member of the Steering Committee in charge of the network:** Thierry Nodenot
- * **Funding:** €50,000

This “Research network” ANR project focused on the challenge of “the information and communication society” and was granted a budget of €50,000. The ambition of the ORPHEE network is to:

- * Create an e-training community by bringing together most of the players in this field.
- * Structure the community and synergize the potential of the partners to ensure efficient and sustainable mobilization to rise to challenges posed by e-training.
- * Combine the three aspects: International, Businesses & Training and Experiments.

The LIUPPA is one of the national and international research laboratories taking part in the project; the T2I team is represented by five of its members.

CNRS project: MASTODONS ANIMITEX

- * **2011-2014**
- * **Managed by:** Mauro Gaio & Christian Sallaberry
- * **Partners:** LIRMM, Tetis, GREYC and ICube
- * **Funding:** €5,000

The goal of this project is to make use of heterogeneous textual big data to obtain crucial information for completing the analysis of satellite images. The proposed consortium is based on the advanced competencies of the laboratories involved in text mining and remote-sensing, and its aim is to put in place a synergy of excellence to provide solutions to the issue at hand. The LIUPPA contributes its Geographic Information research skills.

ANR project: MOANO - Models and tools for roaming applications aimed at regional discovery

- * **2011-2014**
- * **Coordinator:** Philippe Roose
- * **Partners:** IRIT Melodi, LIG STEAMER and SIGMA, the LIUPPA T2I and LIFL, COCOA and ADAM
- * **Funding:** €222,910

ANR project: GEONTO - Compilation, alignment, comparison and use of heterogeneous geographic ontologies

- * **2008-2011**
- * **Coordinator:** Chantal Reynaud
- * **Partners:** LRI, COGIT and IRIT
- * **Funding:** €111,072 for the LIUPPA

CNRS project: TGE ADONIS GEOTOPIA1 GEOTOPIA2

- * **2008-2010**
- * **Coordinator:** Thierry JOLIVEAU
- * **Partners:** the Environment, town & society research unit and Makina Corpus
- * **Funding:** €10,700 for GEOTOPIA 1 and €9,500 for GEOTOPIA 2 and for the LIUPPA.