Activity Report 2015

Section Contracts and Grants with Industry

ATEAMS Project-Team

7. Bilateral Contracts and Grants with Industry

7.1. Bilateral Grants with Industry

With the **ING bank** we a running a four-year project on advising and research in functional and non-functional properties of a part of the ING IT-infrastructure. The project involves modelling a large part of the product portfolio and using state-of-the-art MDE technology to simulate, verify and generate part of its IT infrastructure. The funding of this project is approximately 50% industry, 50% grants from CWI & NWO.

<p align="center" style="color:red">DREAMPAL Project-Team</p>

7. Bilateral Contracts and Grants with Industry

7.1. Bilateral Contracts with Industry

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

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

<p style="text-align:center">**DOLPHIN Project-Team**</p>

8. Bilateral Contracts and Grants with Industry

8.1. Bilateral Contracts with Industry

- Intel (2015-2016) Bilateral academic and research partnarship between Université Lille 1 and Intel. In this context, Intel will provide Lille 1 with technical support help for the dissemination of its activities related to High Performance Computing.
- Strat-Logic (2012-2015): the objective of this CIFRE contract is the optimization of economic decisions in a competitive business management simulator (Phd of S. Dufourny).
- Vekia (2012-2015): the goal of the CIFRE project is to develop an efficient and generic software for employee scheduling in retail (Phd of M. Gérard).
- PIXEO (2014-2018): the objective of this bilateral project is the predictive models and knowledge extraction for insurance web comparator.
- Normand (2014-2015]: the objective of this contract is the modelling of a dynamic multi-objective scheduling problem in the medical analysis.
- Beckman (2015-2018]: the goal of this contract concerns the strategic and operational planning medical laboratories.

8.2. Bilateral Grants with Industry

- Intel 2015-2016 Bilateral grant with Intel. Intel has supported with a budget equivalent to 25K€ the acquisition of a cluster of 2 multi-core servers and 8 Intel Xeon Phi coprocessors. The objective is to develop research and teaching on multi and many-core computing on coprocessors.

INOCS Team

5. Bilateral Contracts and Grants with Industry

5.1. Bilateral Contracts with Industry

- Industrial contract with EDF, Bilevel models for tariff setting problems in the energy field (2010-2011; 2012-2015)
- Industrial contract with Coliweb, Load charge assignent for freight deliveries (2015-2016)

5.2. Bilateral Grants with Industry

- Gaspard Monge Program for Optimisation and operationnal research, Design and Pricing of Electricity Services in a Competitive Environment (2015-2018)
- Gaspard Monge Program for Optimisation and Operationnal Research, BENMIP A Generic Benders Decomposition based (Mixed) Integer Programming Solver, (2015-2016)

MEPHYSTO Team (section vide)

8. Bilateral Contracts and Grants with Industry

8.1. Genoscreen

Participant: Guillemette Marot.

Subject: Genoscreen is a company which offers innovative solutions in genomics and molecular biology. New technologies such as high throughput sequencing have raised statistical questions to analyse metagenomic data. Formation and expertise has been provided to this company to help them analyse this new type of data.

8.2. Bilateral Contracts with Industry

Participant: Julien Jacques.

ORANGE Labs : contrat de recherche pour l'extraction de connaissances dans de gros volumes de données hétérogènes pour la gestion automatique des réseaux radio, en lien avec le financement de la thèse CIFRE de Yosra Ben Slimen.

8.3. Arcelor-Mittal

Participants: Christophe Biernacki, Clément Thery.

Subject: Supervised and semi-supervised classification on large data bases mixing qualitative and quantitative variables. Arcelor Mittal faced some quality problems in the steel production which lead to supervised and semisupervised classification involving (1) a small number of individuals comparing to the numbers of variables, (2) heterogeneous variables, typically categorical and continous variables and (3) potentially highly correlated variables. A PhD CIFRE grant started on May 2011 on this topic and has finished on July 8th 2015. It has led also the the CorReg package, available on the CRAN (https://cran.r-project.org/web/packages/CorReg/index.html) and referenced on the Inria BIL application

8.4. Auchan

Participants: Christophe Biernacki, Serge Iovleff, Vincent Vandewalle.

Subject: Groupe Auchan SA is a French international retail group and multinational corporation headquartered in Croix. It is one of the world's principal distribution groups with a presence in 12 countries and 269,000 employees. The aim of the two months contracts (It started late 2014 and finished early in 2015) between Auchan and Modal is to identify human factors which significantly impact the economical results of the company. From a scientific point of view, it corresponds to regression studies (simple and mixture regression) with missing data and correlated data.

8.5. PIXEO

Participants: Christophe Biernacki, Anne Lise Bedenel.

Subject: PIXEO is a company allowing online comparisons of insurances. A PhD thesis for optimizing the workflow related to this activity started in June 2015, with co-supervisision of Laetitia Jourdan of the Dolphin Inria team. The title of the thesis is "Supervised and unsupervised classification with descriptors evolving in time. Application to online comparisons of insurances." Before the beginning of the thesis, a preliminary contract has been established since October 2014 until May 2015, in order to prepare precisely the research subject. It was a work in collaboration with two members of the Dolphin Inria team (Laetitia Jourdan and Marie-Eléonore Marmion).

8.6. Cylande

Participants: Christophe Biernacki, Etienne Goffinet, Vincent Kubicki, Vincent Vandewalle.

Subject: Cylande is a company which provides software solutions for retail. The aim of the contract is to provide statistical tools for optimal management delivery. The proposed solution relies on density estimation and also on model-based clustering, both for mixed data (count data, categorical data, continuous data). It should involved the MixtComp software (referenced on the Inria BIL application) developed by the team. It is a 12 months contract, started on October 1st 2015.

NON-A Project-Team

7. Bilateral Contracts and Grants with Industry

7.1. Bilateral Contracts with Industry

- a PhD CIFRE with SAGEM (France), supervisors are Alban Quadrat and Hugues Mounier

8. Bilateral Contracts and Grants with Industry

8.1. Bilateral Contracts with Industry

Roberta Tittarelli was in PhD under the co-direction of Emmanuel Creusé (with S. Nicaise, LAMAV Valenciennes and F. Piriou, L2EP Lille 1) on an EDF R&D Support (CIFRE) from October 2012 to October 2015. She worked on a posteriori error estimators for problems arising in low-frequency electromagnetics. She developped residual estimators for unsteady problems, as well as equilibrated ones for harmonic formulations (see section 6.2 for new results about this last point). Its contributions have been implemented in the EDF R&D code "Carmel-3D", and allow to improve the simulations by providing an efficient tool driving the mesh refinement algorithms. She is now on an ATER support at Lille 1 University and and the PhD's defense should occur before the middle of 2016.

C. Cancès supervises the PhD Thesis of Nicolas Peton at IFPEN since October 15, 2015. The bilateral contract should be signed in the forthcoming weeks.

SEQUEL Project-Team

8. Bilateral Contracts and Grants with Industry

8.1. Bilateral Contracts with Industry

- Jeremie Mary got a contract with Nuukik on the use of seasonality to improve recommender systems for e-commerce. This work won the price of the "Best data analysis" at "La nuit du commerce connecté" - http://www.retail-network.fr", 1500 participants, 80 projects in 5 categories.

8.2. Bilateral Grants with Industry

- Romain Warlop obtains a CIFRE grant with the start-up Fifty-Five and started his PhD in July under the supervision of Alessandro Lazaric, Jérémie Mary and Philippe Preux. The PhD is on the use of tensor and bandits techniques for recommender systems with a special focus on the cold start problem, and the non-stationarity of the environment.

- Nicolas Carrara obtains a CIFRE grant with Orange Labs and started his PhD in October under the supervision of Olivier Pietquin. The PhD topic is on transfer learning for fast adaption of spoken dialogue systems.

BONSAI Project-Team

8. Bilateral Contracts and Grants with Industry

8.1. Bilateral Contracts with Industry

The PhD thesis of Lea Siegwald is funded by a CIFRE contract with the biotechnology company Gene Diffusion.

<p align="center" style="color:red">FUN Project-Team</p>

8. Bilateral Contracts and Grants with Industry

8.1. Bilateral Contracts with Industry

- Traxens partnershipTraxens partnership
  Participants: Natale Guzzo, Nathalie Mitton [correspondant].

  This collaboration aims to set up a full protocol stack for TRAXENS's guideline. This collaboration is a CIFRE contract. In the framework of this collaboration, a full protocol stack has been developed for the purpose of container monitoring. 3 national and 2 international patents have been submitted so far. 2 are under preparation.

8. Bilateral Contracts and Grants with Industry

8.1. SafePython FUI

Participants: Damien Cassou [Correspondant], Jean-Baptiste Arnaud, Stéphane Ducasse.

Contracting parties: CEA, Evitech, Inria, Logilab, Opida, Thales, Wallix.

Beyond embedded computing, there is not so much research and development on the verification of software safety. Recently, some tools have been created for languages such as JAVA, SQL, VB or PHP. Nevertheless, nothing exists for Python even though this language is growing fast. SafePython's goal is to provide code analysis tools applicable to Python programs. This project will define a subset of Python that the developers will have to use to have their programs analyzed.

8.2. Sponsoring LAM

Participants: Stéphane Ducasse [Correspondant], Marcus Denker.

Contracting parties: Inria, LAM Research, Inc.

LAM Research Inc.(http://lamrc.com) is a leading supplier of wafer fabrication equipment and services to the global semiconductor industry. LAM has started to sponsor RMOD in 2014. RMOD used the sponsored funds to pay student internships in 2015.

8.3. Worldline CIFRE

Participants: Anne Etien [Correspondant], Nicolas Anquetil, Stéphane Ducasse, Vincent Blondeau.

In the context of a CIFRE PhD we are working on large industrial project characterization. The PhD started in October 2014.

8.4. Pharo Consortium

The Pharo Consortium was founded in 2012 and is growing constantly. As of end 2015, it has 19 company members, 13 academic partners and 3 sponsoring companies. Inria supports the consortium with one full time engineer starting in 2011. More at http://consortium.pharo.org.

<p style="text-align:center">**SPIRALS Project-Team**</p>

8. Bilateral Contracts and Grants with Industry

8.1. ip-label

Participants: Christophe Ribeiro, Romain Rouvoy [correspondant].

A software exploitation license of the APISENSE$^{®}$ crowd-sensing platform has been sold to the ip-label company. They use this platform as a solution to monitor the quality of the GSM signal in the wild. The objective is to provide developers and stakeholders with a feedback on the quality of experience of GSM connection depending on their location.

8.2. Orange Labs

Participants: Laurence Duchien [correspondant], Amal Tahri.

This collaboration aims at bridging the gap between home networks and cloud environments for the design, the provisionning and the administration of distributed services. The purpose is to define solutions, essentially software design tools and runtime infrastructures, for the seamless migration of distributed applications and services between home networks and cloud environments. The envisioned approach is based on the research activities that we are conducting in the domain of software product lines.

This collaboration is conducted in the context of the ongoing PhD thesis of Amal Tahri.

8.3. Scalair

Participants: Yahya Al-Dhuraibi, Philippe Merle [correspondant].

This collaboration aims at proposing a framework to deal with elasticity in cloud computing environments. This framework must cover all kind of resources, IaaS, PaaS, SaaS, must provide a solution for interoperability between different clouds and virtualization technologies, and must enable the specification and composition of reactive and predictive strategies.

This collaboration is conducted in the context of the ongoing PhD thesis of Yahya Al-Dhuraibi.

DEFROST Team (section vide)

LINKS Team

8. Bilateral Contracts and Grants with Industry

8.1. Bilateral Grants with Industry

Innovimax is founding the PhD thesis of Tom SEBASTIAN (2011-15). The thesis is supervised by J.NIEHREN in cooperation with M.ZERGAOUI the head of the INNOVIMAX company. The software development in this context is supported by T. SEBASTIAN.

MAGNET Team

8. Bilateral Contracts and Grants with Industry

8.1. Bilateral Contracts with Industry

8.1.1. KeyCoopt (2015)

Participants: Rémi Gilleron [correspondent], François Noyez, Fabien Torre.

We have a bilateral contract with the KEYCOOPT company. The goal of the company is to suggest candidates for job offers. For this, the company has a large pool of referrers, also named coopters. The process is: given a job offer, some coopters are selected, each coopter may suggest a candidate, the proposed candidates are selected by KEYCOOPT and some candidates are proposed in answer to the job offer. We propose a machine learning based method for selecting coopters given a job offer. The method is a ranking algorithm using support vector machines (SVMRank). It has been developed and tested and can be integrated in the information system of KEYCOOPT. Possible improvements are to use natural language processing methods in order to use texts as texts for job offers, and to use the network of coopters.

8.2. Bilateral Grants with Industry

8.2.1. Cifre Clic and Walk (2013-2016)

Participants: Mikaela Keller [correspondent], Pauline Wauquier, Marc Tommasi.

We have a one to one cooperation with the CLIC AND WALK company that makes marketing surveys by consumers (called clicwalkers). The goal of the company is to understand the community of clicwalkers (40 thousands in one year) and its evolution with two objectives: the first one is to optimize the attribution of surveys to clicwalkers, and the second is to expand company's market to foreign countries. Social data can be obtained from social networks (G+, Facebook, ...) but there is no explicit network to describe the clicwalkers community. But users activity in answering surveys as well as server logs can provide traces of information diffusion, geolocation data, temporal data, sponsorship, etc. We will study the problem of adaptive graph construction from the clicwalkers network. Node (users) classification and clustering algorithms will be applied. For the problem of survey recommendations, the problem of teams constitution in a bipartite graphs of users and surveys will be studied. Random graph modeling and generative models of random graphs will be one step towards the prediction of the evolution of clicwalkers community.

8.2.2. Cifre SAP (2011-2014)

Participants: Rémi Gilleron [correspondent], Marc Tommasi, Thomas Ricatte.

The PhD defense of Thomas Ricatte was held in Lille on January 23th 2015.

MINT Project-Team

7. Bilateral Contracts and Grants with Industry

7.1. Bilateral Contracts with Industry

7.1.1. Ayodyo (10 Keuros) (sept. 2015-mar 2016)

Embedded software tools for movement-enriched musical instrument. 10 Keuros contract.

7.1.2. Holusion (15 Keuros) (jan-mar 2015)

STAR on holographic displays, and methodological recommendations for interaction design and HCI principles.

7.1.3. Bipolar-production (3 Keuros), nov. 2015-fev. 2016

Licence for a software result issued from Y. Rekik thesis (multi-touch public interaction, software aiming at strengthening tactile interaction)

Mjolnir Team (section vide)