RESEARCH CENTER
Grenoble - Rhône-Alpes

FIELD

Activity Report 2019

Section Contracts and Grants with Industry

Edition: 2020-03-21

ARIC Project-Team

8. Bilateral Contracts and Grants with Industry

8.1. Bilateral Contracts with Industry

Bosch (Germany) ordered from us some support for implementing complex numerical algorithms (participants: Claude-Pierre Jeannerod and Jean-Michel Muller).

8.2. Bilateral Grants with Industry

- Miruna Rosca and Radu Titiu are employees of BitDefender. Their PhD's are supervised by Damien Stehlé and Benoît Libert, respectively. Miruna Rosca works on the foundations of lattice-based cryptography, and Radu Titiu works on pseudo-random functions and functional encryption.
- Adel Hamdi is doing is PhD with Orange Labs and is supervised by Fabien Laguillaumie. He is working on advanced encryption protocols for the cloud.

CASH Project-Team

7. Bilateral Contracts and Grants with Industry

7.1. Bilateral Contracts with Industry

CIFRE Ph.D of Julien Emmanuel with Bull/Atos, hosted by Inria. 2020-2023.

CONVECS Project-Team

8. Bilateral Contracts and Grants with Industry

8.1. Bilateral Grants with Industry

8.1.1. Orange Labs

Participants: Umar Ozeer, Gwen Salaün.

Umar Ozeer is supported by a PhD grant (from November 2016 to November 2019) from Orange Labs (Grenoble) on detecting and repairing failures of data-centric applications distributed in the cloud and the IoT (see § 7.5.1), under the supervision of Loïc Letondeur (Orange Labs), Gwen Salaün (CONVECS), François Gaël Ottogalli (Orange Labs), and Jean-Marc Vincent (POLARIS project-team).

8.1.2. Nokia Bell Labs

Participants: Radu Mateescu, Ajay Muroor Nadumane, Gwen Salaün.

Ajay Muroor Nadumane is supported by a PhD grant (from October 2017 to October 2020) from Nokia Bell Labs (Nozay) on IoT service composition (see § 7.5.2) supported by formal methods, under the supervision of Gwen Salaün (CONVECS), Radu Mateescu (CONVECS), Ludovic Noirie, and Michel Le Pallec (Nokia Bell Labs).

CORSE Project-Team

7. Bilateral Contracts and Grants with Industry

7.1. Bilateral Contracts with Industry

7.1.1. Atos/Bull

- Title: Static and dynamic approaches for the optimization of the energy consumption associated with applications of the High Performance Computing (HPC) field
- CORSE participants: François Broquedis, Frédéric Desprez, Mathieu Stoffel
- Partner: Atos/Bull
- Duration: February 2018 - February 2021
- Abstract: The purpose of this project is to dynamically improve the energy consumption of HPC applications on large-scale platforms. It relies on an adaptation of the CPU frequency at runtime, based on the analysis of hardware-related metrics to determine an *application profile*. This profile is then split into different *phases*, each of which being associated to a best CPU frequency, depending on its nature (CPU bound, memory bound, ...). This project is funding the PhD of Mathieu Stoffel, and the corresponding development is to be integrated into *Bull Dynamic Power Optimizer*, a software suite developed by Atos/Bull.

7.2. Bilateral Grants with Industry

7.2.1. ES3CAP

- Title: Embedded Smart Safe Secure Computing Autonomous Platform
- CORSE participants: Fabrice Rastello, Nicolas Tolenaere
- Duration: July 2018 - August 2021
- INRIA Partners: AOSTE, PARKAS, CHROMA
- Other Partners: Renault-Nissan, EasyMile, Safran E&D, MBDA, ANSYS/ESterel Technologies, Kronno-Safe, Prove & Run, Kalray, Prophesee, CEA
- Abstract: The objective of ES3CAP is to develop a tool-chain that targets multi- and many-core architectures for critical systems. In particular it should address the different challenges related to making existing critical systems solutions (heterogeneous, decentralized, single-core, single-task) match the industrial constraints targeted by Kalray's MPPA (MPPA, high-performance, real-time, safety, security). Considered applications are autonmous driving, drones, avionics, and defense. CORSE is involved in the optimization of machine learning algorithms for many-core architectures.

DATASPHERE Team

7. Bilateral Contracts and Grants with Industry

7.1. Bilateral Grants with Industry

The PhD Thesis of Colin Gerard is funded through a contract with DGA (Ministry of Defense).

PRIVATICS Project-Team (section vide)

SPADES Project-Team

7. Bilateral Contracts and Grants with Industry

7.1. Bilateral Contracts with Industry

- Inria and Orange Labs have established in 2015 a joint virtual research laboratory, called I/O LAB. We have been heavily involved in the creation of the laboratory and are actively involved in its operation (Jean-Bernard Stefani is one of the two co-directors of the lab). I/O LAB focuses on the network virtualization and cloudification. As part of the work of I/O LAB, we have cooperated with Orange Lab, as part of a cooperative research contract funded by Orange, on defining architectural principles and frameworks for network cloud infrastructures encompassing control and management of computing, storage and network resources.

7.2. Bilateral Grants with Industry

With Orange:

- Fault Management in Multi-Tenant Programmable Networks. This CIFRE grant funds the PhD of Sihem Cherrared.
- Dynamic dataflow models of computation. This CIFRE grant funds the PhD of Arash Shafiei.

ELAN Project-Team (section vide)

MISTIS Project-Team

8. Bilateral Contracts and Grants with Industry

8.1. Bilateral Contracts with Industry

Contract with EDF (2019). Stéphane Girard is the advisor of the internship of Valentin Chevalier founded by EDF. The goal is to investigate sensitivity analysis and extrapolation limits in extreme-value theory with application to extreme weather events. The financial support for MISTIS is of 50 keuros.

Contract with VALEO (2018-2019). Stéphane Girard and Pascal Dkengne Sielenou are involved in a study with Valeo to assess the relevance of extreme-value theory in the calibration of sensors for autonomous cars. The financial support for MISTIS is of 100 keuros.

Contract with Andritz. F. Forbes and C. Braillon (SED) are involved in a study with Andritz to elaborate metrics based on image analysis to assess the quality of nonwaven tissues. The financial support for MISTIS is of 15 keuros.

NANO-D Team (section vide)

NECS Team

8. Bilateral Contracts and Grants with Industry

8.1. Bilateral Contracts with Industry

TMI-V (Tachymètre Magnéto-Inertiel couplé Vision). Co-PI: H. Fourati (2018-2022)
The objective of the TMI-V project is the indoor localization without infrastructure, by developing an autonomous, precise, robust solution with no prior knowledge of the environment integrated in equipment worn on the upper body to be used in virtual reality and augmented reality applications. An array of magnetometers and inertial sensors will be used. The project is ongoing, in collaboration with SysNav company.

TRIPOP Project-Team

7. Bilateral Contracts and Grants with Industry

7.1. Schneider Electric

This action started in 2001 with my post-doc co–supported by Schneider Electric and CNRS. With some brief interruptions, this action is still active and should further continue. It concerns mainly the simulation and modeling of multi–body systems with contact, friction and impacts with the application for the virtual prototyping of electrical circuit breakers. During these years, various forms of collaborations have been held. Two PhD thesis have been granted by Schneider Electric (D.E. Taha and N. Akhakdar) accompanied with research contracts between Inria and Schneider Electric. Schneider Electric participated also the ANR project Saladyn as a main partner. Without going into deep details of the various actions over the years, the major success of this collaboration is the statistical tolerance analysis of the functional requirements of the circuit breakers with respect to clearance in joints and geometrical tolerances on the parts. Starting from the geometrical descriptions (CAD files) of a mechanism with prescribed tolerances on the manufacturing process, we perform worst-case analysis and Monte–Carlo simulations of the circuit breaker with Siconos and we record the variations in the functional requirements. The difficulty in such simulations are the modeling of contact with friction that models the joints with clearances. The results of these analysis enable Schneider Electric to define the manufacturing precision that has a huge impact of the production cost (Schneider Electric produces several millions of C60-type circuit breaker per year). Note that it is not possible to perform such simulations with the existing software codes of the market. At the beginning, our interlocutor at Schneider Electric was the innovation (R&D) department. Now, we are working and discussing with the business unit, Division Power and Dinnov (M. Abadie, E. Boumediene, X. Herreros) in charge of designing and producing the circuit–breakers. The targeted users are the R&D engineers of Schneider Electric that use simulation tools for designing new models or improving existing circuit breakers. This collaboration continues with new modeling and simulation challenges (flexible parts, multiple impact laws) with the CIFRE PhD of Rami Sayoud.

7.2. STRMTG

We have recently started with STRMTG a research contract about modelling, simulation and control of cable-transport systems. In such systems, the question of the coupling between the nonlinear dynamics of cables and their supports with unilateral contact and friction appears now to be determinant in order to increase the performances of the cableway systems, especially for urban transportation systems.

AIRSEA Project-Team

7. Bilateral Contracts and Grants with Industry

7.1. Bilateral Contracts with Industry

A 3-year contract (from June 2016 to June 2019) named ALBATROSS with Mercator-Ocean on the topic « Interaction océan, vagues, atmosphère à haute résolution» (PI: F. Lemarié).

A 2-year contract with Mercator-Ocean on the thematic "The AGRIF software in the NEMO European ocean model": see 5.1

Contract with IFPEN (Institut Français du pétrole et des énergies nouvelles), for the supervision of a PhD (Adrien Hirvoas). Research subject: Development of a data assimilation method for the calibration and continuous update of wind turbines digital twins

The Chair OQUAIDO – for "Optimisation et QUAntification d'Incertitudes pour les Données Onéreuses" in French – is the chair in applied mathematics held at Mines Saint-Étienne (France). It aims at gathering academical and technological partners to work on problems involving costly-to-evaluate numerical simulators for uncertainty quantification, optimization and inverse problems. This Chair, created in January 2016, is the continuation of the projects DICE and ReDICE which respectively covered the periods 2006-2009 and 2011-2015. Reda El Amri's PhD thesis [1] has been funded by OQUAIDO. The Chair is reconducted for one year in 2020 and then a new contract should be approved by all partners for a new 4-years period.

BEAGLE Project-Team (section vide)

DRACULA Project-Team (section vide)

ERABLE Project-Team

7. Bilateral Contracts and Grants with Industry

7.1. Bilateral Grants with Industry

7.1.1. Spock

- Title: characterization of hoSt-gut microbiota interactions and identification of key Players based on a unified reference for standardized quantitative metagenOmics and metaboliC analysis frameworK
- Industrial Partner: MaatPharma (Person responsible: Lilia Boucinha).
- ERABLE participants: Marie-France Sagot (ERABLE coordinator and PhD main supervisor with Susana Vinga from IST, Lisbon, Portugal, as PhD co-supervisor), Marianne Borderes (beneficiary of the PhD scholarship in MaatPharma).
- Type: ANR Technology (2018-2021).
- Web page: http://team.inria.fr/erable/en/projects/#anr-technology-spock.

IBIS Project-Team (section vide)

MOSAIC Project-Team (section vide)

NUMED Project-Team (section vide)

STEEP Project-Team

7. Bilateral Contracts and Grants with Industry

7.1. Bilateral Contracts with Industry

Contract with **ADEME** (French Environment and Energy Management Agency [0]), within a collaboration with FCBA [0], Arvalis [0], Terres Univia [0], and Terres Inovia [0]. Design and development of an interactive spreadsheet application for scenarizing non-food biomass flows in France, from production to consumption (energy and non-energy uses). Visualization in the form of Sankey diagrams.

Contract with **Aura-EE** (Energy and Environment Agency of the Auvergne–Rhône-Alpes Region [0]), within the Interreg Alpine Region program. Estimation of material flows within the wood supply chain in the Alps European Region.

Contract with **Aura-EE** within the European project IMEAS. Estimation of wood flows between the Vercors Regional Natural Parc and the Grenoble metropolitan area.

[0] https://www.ademe.fr/en
[0] https://www.fcba.fr
[0] https://www.arvalisinstitutduvegetal.fr/gis-@/view-607-arvstatiques.html
[0] http://www.terresunivia.fr
[0] https://www.terresinovia.fr
[0] https://en.auvergnerhonealpes-ee.fr

AGORA Project-Team

8. Bilateral Contracts and Grants with Industry

8.1. Bilateral Contracts with Industry

- We have contracted a first bilateral contract with Total (2018-2021) where we work with the laboratory LQA of Total on the design and the test of autonomous low cost air quality sensors. The Lora-based developed platform is currently deployed and evaluated by LQA.
- We have contracted bilateral cooperation with industrial and academic partners in the context of the PSPC Fed4PMR project (2015-2019). In this context, we are working on the design of new professional mobile radio solutions, compatible with 4G and 5G standards. This collaboration funds the PhD thesis of Jad Oueis, the PhD thesis of Romain Pujol, and a part of the PhD thesis of Abderrahman Ben Khalifa.

8.2. Bilateral Grants with Industry

- Common Laboratory Inria/Nokia Bell Labs - ADR Network Information Theory.
  Agora is part of the ADR Network Information Theory of the common laboratory Inria/Nokia Bell Labs.
- Spie - INSA Lyon IoT Chaire.
  Agora is involved in the SPIE INSA Lyon IoT Chaire, launched in November 2016. The IoT Chaire partially funds the PhD thesis of Abderrahman Ben Khalifa.
- Volvo - INSA Lyon Chaire.
  Agora is involved in the Volvo Chaire at INSA Lyon, on the area of autonomous electrical distribution vehicle in urban environments. Razvan Stanica is a member in the steering committee of this structure.

AVALON Project-Team

7. Bilateral Contracts and Grants with Industry

7.1. Bilateral Contracts with Industry

7.1.1. Nokia Bell Labs

AVALON has been actively collaborating with Nokia, formerly Alcatel-Lucent Bell Labs, in the framework of the Nokia/Alcatel-Lucent Inria Joint Laboratory. We was involved in the following Research Actions (Actions de Recherche (ADR) in French) of this laboratory. ADR Nokia Bell Labs /Inria: Procedural Generation of Networks for Security Research & Experimentations. The objective of this project is to address such challenge. We aim at devising a new way where researchers can communicate in a comprehensive and accurate way the experimentation set-up used in their work. The main objective would be to research and develop the procedural generation of credible network topologies and test beds resembling real operational infrastructures of various kinds (e.g. classical ICT, virtualized Cloud or SDN based, SCADA infrastructures etc.), as a method of creating data algorithmically as opposed to manually. This work is done with a postdoc position: Cyril Seguin.

7.1.2. MUMPS Technologies

AVALON has a collaboration with MUMPS Technologies. The funding is dedicated for Marie Durand during few months to make experimental validation of the interest of using XKBLAS library to let MUMPS software to gain in performance on multi-GPUs server.

7.2. Bilateral Grants with Industry

7.2.1. Orange

We have a collaboration with Orange. This collaboration is sealed through a CIFRE Phd grant. The research of the Phd student (Arthur Chevalier) focuses on placement and compliance aspects of software licenses in a Cloud architecture. Today, the use of software is regulated by licenses, whether they are free, paid for and with or without access to its sources. The number of licenses required for specific software can be calculated with several metrics, each defined by the software vendor. Our goal is to propose a deployment algorithm that takes into account different metrics.

CTRL-A Project-Team

8. Bilateral Contracts and Grants with Industry

8.1. Bilateral Grants with Industry

8.1.1. Orange

We have a cooperation with Orange labs, around a CIFRE PhD grant, on the topic of autonomic device management (see Section 7.2.4.1). This activity is part of the Inria/Orange joint laboratory.

8.1.2. Nokia / Bell labs

We have a research action with Nokia / Bell labs, around a post-doctorate, co-advised with project-team Dyonisos at Inria Rennes, on the topic of the Autonomic management in Software Defined Networks. This activity is part of the Inria/ Nokia / Bell labs joint laboratory.

DANTE Project-Team

8. Bilateral Contracts and Grants with Industry

8.1. GranData

Participants: Márton Karsai [correspondant], Éric Fleury.

Founded in 2012, Grandata is a Palo Alto-based company that leverages advanced research in Human Dynamics (the application of « big data » to social relationships and human behaviour) to identify market trends and predict customer actions. Leading telecom and financial services firms are using Grandata's Social Universe product to transform « big data » into impressive business results.

The DANTE team and Grandata started to collaborate in 2014 on the analysis of large datasets provided by the company. The aim of the collaboration is to gain better understanding about the dynamical patterns of human interactions, mobility, and the socio-economic structure of the society. Currently the collaboration is supported by the MOTIF Stic-AmSud project (2018-2020) (coordinated by Márton Karsai) which allows to meet frequently with the company. Recent projects within this collaboration are focusing on socioeconomic inference using remote sensing techniques.

DATAMOVE Project-Team

8. Bilateral Contracts and Grants with Industry

8.1. Bilateral Contracts with Industry

- **EDF R&D (2019)**. Integration of Melissa and OpenTurn.
- **TOTAL SA (2019)**. Proof of Concept for performing large scale sensibility analysis with Melissa on Total use-case.

8.2. Bilateral Grants with Industry

- **ATOS-BULL (2016-2019)**. Two PhD grants (Michael Mercier and Adrien Faure). Job and resource management algorithms.
- **Qarnot Computing (2019-2022)**. PhD grant (Angan Mitra).

MARACAS Team

8. Bilateral Contracts and Grants with Industry

8.1. Bilateral Contracts with Industry

We have currently the following partnerships

1. Inria-Nokia Bell Labs common lab (600k€) : we are involved in two research actions (Analytics, and Network Information Theory), with the funding of two PhDs and 1 postdoc (to be hired) for Maracas.
2. SPIE-ICS (1Meuros, 2017-2021) : The Insa-Spie IoT Chair http://www.citi-lab.fr/chairs/iot-chair/ relies on the expertise of the CITI Lab. The skills developed within the different teams of the lab integrate the study, modelling, conception and evaluation of technologies for communicating objects and dedicated network architectures. It deals with network, telecom and software matters as well as societal issues such as privacy. The chair will also lean on the skills developed at INSA Lyon or in IMU LabEx. The SPIE-ICS / Insa Lyon chaire on IoT has been setup in 2017 by JM Gorce for the benefit of the CITIlab. JM Gorce was the head of this chair from 2016 to 2019 and is now vice-head (Frédéric Le Mouel is heading the chair since sept 2019). The remaining budget for Maracas corresponds to one postdoc to be hired nad overhead costs.
3. Sigfox : we are collaborating with Sigfox for several years. Maracas explored the performance of UNB networks with an emphasis on robust signal processing techniques (PhD defended on Dec 2018) and a new contract is in preparation for a PhD grant to be started in September, 2020.
4. Orange Labs : our research contract ended in 2018 and we are preparing a new contract.

8.2. Bilateral Grants with Industry

1. PhD grant of Mathieu Goutay (with Nokia Bell Labs, 2019-2022).

POLARIS Project-Team

8. Bilateral Contracts and Grants with Industry

8.1. Bilateral Grants with Industry

Nicolas Gast obtained funding Enedis for a study on the PLC-G3 protocol (≈50k euros).

ROMA Project-Team

8. Bilateral Contracts and Grants with Industry

8.1. Bilateral Contracts with Industry

In the context of a consortium (http://mumps-consortium.org) of users of the MUMPS library (http://mumps-solver.org), we had partnership contracts with EDF, ALTAIR, FFT-MSC Software, Michelin, LSTC, Siemens, ESI Group, Total, Safran, LBNL, Airbus, and SHELL. Following the creation of the start-up Mumps Technologies in January 2019, these contracts (scientific exchanges, support, organization of point-to-point and plenary meetings, releases in advance, ...) have been transferred to Mumps Technologies.

SOCRATE Project-Team

6. Bilateral Contracts and Grants with Industry

6.1. Bilateral Contracts with Industry

6.1.1. Research Contract with Bosch 2019

In collaboration with Aric, Socrate worked with Bosch on the impementation of the Power function in an embedded context.

CHROMA Project-Team

8. Bilateral Contracts and Grants with Industry

8.1. Bilateral Contracts with Industry

8.1.1. VOLVO-Renault Trucks Group (2016-2019)

Participants: Olivier Simonin, Jilles Dibangoye, Guillaume Bono, Mohamad Hobballah, Laetitia Matignon.

This collaboration has been built inside the INSA-VOLVO Chair, led by Prof. Didier Remond (INSA). In this context, the Chair funds the PhD Thesis of Guillaume Bono (2016-19) in Chroma. The objective is to study how machine learning techniques can deal with optimization of goods distribution using a fleet of autonomous vehicles. In the following of the first results, VOLVO proposed to extend our collaboration by funding a Post-doc position concerning good distribution with platoons of autonomous vehicles. This is the Post-Doc of Mohamad Hobballah, started on February 2018.

8.1.2. Toyota Motor Europe (2006 - 2018)

Participants: Christian Laugier, David Sierra González, Özgür Erkent, Jilles Dibangoye, Christian Wolf.

The contract with Toyota Motors Europe is a joint collaboration involving Toyota Motors Europe, Inria and ProbaYes. It follows a first successful short term collaboration with Toyota in 2005. This contract aims at developing innovative technologies in the context of automotive safety. The idea is to improve road safety in driving situations by equipping vehicles with the technology to model on the fly the dynamic environment, to sense and identify potentially dangerous traffic participants or road obstacles, and to evaluate the collision risk. The sensing is performed using sensors commonly used in automotive applications such as cameras and lidar.

This collaboration has been extended in 2018 for 4 years (period 2018-2021) and Toyota provides us with an experimental vehicle Lexus equipped with various sensing and control capabilities. Several additional connected technical contracts have also been signed, and an exploitation licence for the *CMCDOT* software has been bought by Toyota in 2018.

8.2. Bilateral Grants with Industry

8.2.1. Renault (2015 - 2018)

Participants: Mathieu Barbier, Christian Laugier, Olivier Simonin.

This contract was linked to the PhD Thesis of Mathieu Barbier (Cifre Thesis). The objective is to develop technologies for collaborative driving as part of a Driving Assistance Systems for improving car safety in road intersections. Both vehicle perception and communications are considered in the scope of this study. Some additional short-term contracts (about 3 months) and an evaluation license for the team *CMCDOT* software have also been signed during this period. *We are on the process of signing a new PhD research agreement for the period 2019 – 2021, with objective to address the open problem of emergency obstacle avoidance in complex traffic situations (for ADAS or AD applications).*

8.2.2. IRT Nanoelec – Security of Autonomous Vehicles project (2018 - 2020)

Participants: Christian Laugier, Lukas Rummelhard, Jerome Lussereau, Jean-Alix David, Thomas Genevois, Nicolas Turro [SED].

Security of Autonomous Vehicles is a project supported by ANR in the scope of the program PULSE of IRT Nanoelec. The objective of this project is to integrate, develop and promote technological bricks of context capture, for the safety of the autonomous vehicle. Building on *Embedded Bayesian Perception for Dynamic Environment*, Bayesian data fusion and filtering technologies from sets of heterogeneous sensors, these bricks make it possible to secure the movements of vehicles, but also provide them with an enriched and useful representation for autonomy functions themselves. In this context, various demonstrators embedding those technology bricks are developed in cooperation with industrial partners.

IMAGINE Project-Team

8. Bilateral Contracts and Grants with Industry

8.1. Bilateral Contracts with Industry

We have an ongoing CIFRE PhD contract with PSA on the topic of aesthetic shape modeling in immersive virtual reality environments, which is funding the PhD of Youna Le Vaou.

MAVERICK Project-Team (section vide)

MOEX Project-Team (section vide)

MORPHEO Project-Team

8. Bilateral Contracts and Grants with Industry

8.1. Bilateral Contracts with Industry

1. The Morpheo Inria team and Microsoft research set up a collaboration on the capture and modelling of moving shapes using multiple videos. Two PhD works are part of this collaboration with the objective to make contributions on 4D Modeling. The PhDs take place at Inria Grenoble Rhône-Alpes and involve visits and stays at Microsoft in Cambridge (UK) and Zurich (CH). The collaboration is part of the Microsoft Research - Inria Joint Centre.
2. The Morpheo Inria team has another collaboration with Facebook reality lab in San Francisco. The collaboration involves one PhD who is currently at the Inria Grenoble Rhône-Alpes working on the estimation of shape and appearance from a single image. The collaboration started in 2019.

PERCEPTION Project-Team (section vide)

PERVASIVE Project-Team

7. Bilateral Contracts and Grants with Industry

7.1. Bilateral Contracts with Industry

7.1.1. CIFRE Doctoral Contract with eLichens

The main topic of the project is to develop cloud-based services for Building Management System (BMS) framework. The aim is to develop predictive algorithms to control Heat Ventilation and Air Conditioning (HVAC) systems addressing two main goals:

1. Improve the well-being of the occupants keeping different variables as temperature, humidity, CO2, air quality measures inside a pre established optimal range;
2. Saving costs optimizing energy consumption

This research is supervised by Patrick Reignier.

THOTH Project-Team

8. Bilateral Contracts and Grants with Industry

8.1. Intel

Participants: Cordelia Schmid, Karteek Alahari.

The Intel Network on Intelligent Systems in Europe brings together leading researchers in robotics, computer vision, motor control, and machine learning. We are part of this network and have participated in the annual retreat in 2018. Funding will be provided on an annual basis, every year, as long as we are part of the network.

8.2. Facebook

Participants: Cordelia Schmid, Jakob Verbeek, Julien Mairal, Karteek Alahari, Pauline Luc, Alexandre Sablayrolles, Mathilde Caron, Lina Mezghani.

The collaboration started in 2016. The topics include image retrieval with CNN based descriptors, weakly supervised object detection and semantic segmentation, and learning structured models for action recognition in videos. In 2016, Pauline Luc started her PhD funded by a CIFRE grant, jointly supervised by Jakob Verbeek (Inria) and Camille Couprie (Facebook AI Research). THOTH has been selected in 2016 as a recipient for the Facebook GPU Partnership program. In this context Facebook has donated two state-of-the-art servers with 8 GPUs. In 2017, Alexandre Sablayrolles started his CIFRE grant, jointly supervised by Cordelia Schmid, and Herve Jegou and Matthijs Douze at Facebook AI Research. In 2018, Mathilde Caron started as a CIFRE PhD student, jointly supervised by Julien Mairal, and Armand Joulin and Piotr Bojanowski at Facebook AI Research. Lina Mezghani is the new PhD student in this collaboration since 2019.

8.3. NAVER LABS Europe

Participant: Karteek Alahari.

This collaboration started when NAVER LABS Europe was Xerox Research Centre Europe, and has been on-going since October 2009 with two co-supervised CIFRE scholarships (2009–2012, 2011-2014). Starting June 2014 we signed a third collaborative agreement for a duration of three years. The goal is to develop approaches for deep learning based image description and pose estimation in videos. Jakob Verbeek and Diane Larlus (XRCE) jointly supervise a PhD-level intern for a period of 6 months in 2016-2017. XRCE then became Naver in 2017. A one-year research contract on action recognition in videos started in Sep 2017. The approach developed by Vasileios Choutas implements pose-based motion features, which are shown to be complementary to state-of-the-art I3D features. Nieves Crasto's internship in 2018 was jointly supervised by Philippe Weinzaepfel (NAVER LABS), Karteek Alahari and Cordelia Schmid. A new CIFRE PhD contract was submitted to ANRT for approval in October 2019.

8.4. Valeo AI

Participants: Karteek Alahari, Florent Bartoccioni.

This collaboration started in 2019 with the arrival of PhD student Florent Bartoccioni. Despite the progress seen in computer vision, artificial systems lack the capability to address the large disparity between human and machine-based scene understanding. For example, at any road intersection most people have the ability to accurately forecast or anticipate events in this scenario, such as changes in colour of the traffic lights, when and how pedestrians are likely to cross the street. This apparently natural human behaviour is not replicable by state-of-theart computer vision methods, which are ill-equipped to make such forecasts. The goal of this collaborative PhD is to address this forecasting problem.

8.5. Criteo

Participant: Julien Mairal.

This collaboration started in April 2019, with the arrival of a master student, Houssam Zenati, who will pursue a CIFRE PhD starting in 2020. The goal of this collaboration is to develop machine learning techniques for counterfactual loss optimization, which is a fundamental problem in machine learning related to causal inference. The goal is to learn stochastic policies, based on offline logged data. The problem is important for web advertising, which is the main activity of the Criteo company, but the potential scope of application is much larger, with possible applications in medicine and experimental sciences.

8.6. Google

Participants: Karteek Alahari, Minttu Alakuijala, Valentin Gabeur, Julien Mairal.

This collaboration started in February 2019, with the arrival of two CIFRE PhD students, Minttu Alakuijala and Valentin Gabeur, who are respectively working on visual models for robotics, and 3D human pose estimation.

TYREX Project-Team (section vide)