RESEARCH CENTER
Grenoble - Rhône-Alpes

FIELD

Activity Report 2013

Section highlights of the Team

Edition: 2014-03-19

ARIC Project-Team

2.2. Highlights of the Year

- Jean-Michel Muller received the CNRS-INS2I silver medal.
- Damien Stehlé was awarded a “starting” ERC grant for his project “Euclidean lattices: algorithms and cryptography” (LattAC).
- Vincent Lefèvre, Nicolas Louvet, and Jean-Michel Muller received the “Prix La Recherche pour les Sciences de l’Information”.

2.5. Highlights of the Year

For 2013, from the point of view of organization, funding, collaborations, the main points to highlight are:

- The Zettice startup project, initiated by Alexandru Plesco and Christophe Alias, won the *concours OSEO 2013* grant (Banque Publique d'Investissement, 40 Keuros) and the *"most promising start-up award"* at SAME 2013. See more details in Section 7.3 .
- Laure Gonnord was hired as assistant professor at ENS-Lyon, she is now a permanent member of Compsys. Fabrice Rastello has left Compsys and will continue his research in Grenoble.
- The collaborations with Colorado State University (S. Rajopadhye) and Ohio State University (Sadayappan) were very successful. New topics of collaboration with the Inria Parkas and Camus teams have started.
- From April 2013 to July 2013, Compsys organized 4 scientific events on compilation, regrouped in a larger and coherent *thematic quarter on compilation* [2], with international audience and visibility. It was mainly funded by the Labex MILYON, see details in Section 9.1 .

From a scientific point of view, the shift, in Compsys III, towards the analysis of parallel programs, the extensions of the polyhedral model, both in terms of techniques and applications, and the code optimizations based on trace analysis has been already fruitful, see the section "New Results", in particular:

- Innovative contributions on parametric tiling [8], [5] as extensions of the polyhedral model.
- A groundbreaking introduction of polyhedral techniques for the analysis of parallel programs, in particular X10 [10], [7].
- Several important contributions (e.g., [2]) that demonstrate the interest of mixing trace analysis and static analysis for code (in particular locality) improvements.

[2] http://labexcompilation.ens-lyon.fr

CONVECS Project-Team (section vide)

DICE Team

2.2. Highlights of the Year

The team has been launched this year and has gained some visibility after a tribune in the French daily Le Monde which obtained more than 1500 "like" on the day of its publication.

"Les données, puissance du futur", S. Grumbach, S. Frénot, Le Grand Débat, Le Monde, 8 janvier 2013

PRIVATICS Team

2.2. Highlights of the Year

The project Mobilitics has made significant advances in the context the Inria-CNIL convention in 2013. Major improvements have been made in the software, which include new capabilities and improved analysis (even for encrypted streams) for the two major systems that are iOS 6.2 and Android 4.1. A first phase of experiments for iOS took place in early 2013 with volunteers from the CNIL. It resulted in a press conference (April 2013) and a large media exposure. A second phase of experiments will take place in 2014 for Android. More targeted work on the our side also led to advances in understanding the ecosystem of mobile applications and the flows of personal information.

We have published at CODASPY 2013 [33] a new formal framework for the analysis of architectural choices. The privacy by design approach has already been put into practice in different application areas. We believe that the next challenge today is to go beyond individual cases and to provide methodologies to explore the design space in a systematic way. As a first step in this direction, we focus on the data minimization principle and consider different options using decentralized architectures in which actors do not necessarily trust each other. We propose a framework to express the parameters to be taken into account (the service to be performed, the actors involved, their respective requirements, etc.) and an inference system to derive properties such as the possibility for an actor to detect potential errors (or frauds) in the computation of a variable. This inference system can be used in the design phase to check if an architecture meets the requirements of the parties or to point out conflicting requirements.

SPADES Team (section vide)

BIPOP Project-Team (section vide)

MISTIS Project-Team

2.2. Highlights of the Year

2.2.1. European project HUMAVIPS.

The European project HUMAVIPS – Humanoids with Auditory and Visual Abilities in Populated Spaces – is a 36-month FP7 STREP project coordinated by Radu Horaud and which started in 2010. The project addressed multimodal perception and cognitive issues associated with the computational development of a social robot. The objective was to endow humanoid robots with audiovisual (AV) abilities: exploration, recognition, and interaction, such that they exhibit adequate behavior when dealing with a group of people. Research and technological developments emphasized the role played by multimodal perception within principled models of human-robot interaction and of humanoid behavior. The HUMAVIPS project was successfully terminated in January 2013.

An article about *Integrating Smart Robots into Society* refers to HUMAVIPS. The article stresses the role of cognition in human-robot interaction and refers to HUMAVIPS as one of the FP7 projects that has paved the way towards the concept of audio-visual robotics. The article was published in HORIZON, which is Europe's Research & Innovation Magazine.

2.2.2. Best Paper Award at IEEE MMSP'13.

The paper addresses the problem of aligning visual and auditory data using a sensor that is composed of a camera-pair and a microphone-pair. The original contribution of the paper is a method for audio-visual data aligning through estimation of the 3D positions of the microphones in the visual centred coordinate frame defined by the stereo camera-pair. Please consult http://www.mmsp2013.org/mmsp2013_awards.php and .
BEST PAPERS AWARDS :
[41] **MMSP 2013 - IEEE International Workshop on Multimedia Signal Processing**. V. KHALIDOV, F. FORBES, R. HORAUD.

NANO-D Team (section vide)

NECS Project-Team

2.2. Highlights of the Year

In 2013, Carlos Canudas de Wit, leader of the NECS team, has become:

- President Elect of the European Control Association EUCA (http://www.euca-control.org/);
- IEEE CSS distinguished lecturer;
- Associate Editor of IEEE Transactions on Control System Technology (since January 2013) and of IEEE Transactions on Control of Network Systems (since June 2013).

OPALE Project-Team

2.3. Highlights of the Year

Opale now participates in the KIC EIT ICT Labs activity, IMS - Intelligent Mobility and Transportation Systems, “Multimodal Mobility". In this area, a new contract with Autoroute Trafic on "Design and validation of traffic flow models on processed data" has been set up.

In the area of multi-disciplinary optimization, technical collaboration with research and industrial partners (Arcelor Mittal) have been enforced and new axes (nanoelectronics with CEA/LETI Grenoble) developed.

Régis Duvigneau defended his habiltation thesis (HdR).

BAMBOO Project-Team

2.1. Highlights of the Year

BAMBOO is proposing the creation of a new Inria project team, ERABLE, that would replace BAMBOO. ERABLE would be a European Inria project team gathering the current members of BAMBOO, together with four researchers in Italy under the banner of the University of Rome La Sapienza (Alberto Marchetti-Spaccamela from La Sapienza, Pierluigi Crescenzi from the University of Florence, Roberto Grossi and Nadia Pisanti from the University of Pisa), and two researchers in the Netherlands under the banner of the CWI (Leen Stougie from the Free University of Amsterdam and the CWI, Gunnar Klau from the CWI). This proposal is currently been evaluated.

BEAGLE Project-Team

2.2. Highlights of the Year

- The Beagle Team has been granted an FP7 project (FET Proactive "Evolving Living Technologies" call). The EvoEvo ("Evolution of Evolution") project connects five european teams working in evolutionary biology (D. Schneider, UJF, France; S. Elena, CSIC, Spain; Beagle, Inria, France), computational biology (P. Hogeweg, Utrecht University, Nederland; Beagle, Inria, France) and unconventional computing (S. Stepney, University of York, UK; Beagle, Inria, France). EvoEvo has been launched at the initiative of the Beagle Team who leads the project. Total amount funded: 2.6 Million euros. Amount funded for Inria : 800.000 euros.
- We organized the international conference "RECOMB Comparative Genomics" in October 2013, in Lyon and the international conference "Models and Algorithms for Genome Evolution" in August 2013 in Montreal, Canada. Following the latter conference, we co-edited a book published in the "Computational biology" series of Springer [37].
- Our long-lasting collaboration with the BM2A team of the CGphyMC (Centre de Génétique et de Physiologie Moléculaire et Cellulaire) is based on co-development of experimental work in the "wet lab" of the CGphyMC and computational experiments in the "dry lab" of Beagle. By using this approach to investigate the molecular basis of the stochasticity of gene expression in higher eukaryotic cells, we have been able to show that this stochasticity is due to intermittent transcription events with very long periods of quiet states. These results have been published in a high impact biological journal in February 2013 [12].
- Our work on the signalling pathways implicated in synaptic plasticity, initiated in 2012 [34] and carried out in collaboration with the experimental neurobiology lab led by L. Venance at Collège de France, Paris, became a major project for Beagle in 2013, with the recruitment of I. Prokin (PhD, Inria grant) and the extension of the collaboration to the group of A. Blackwell (Georges Mason University, USA). Respective publications and funded projects are expected for 2014.
- The project related to the study of intracellular reaction-diffusion dynamics of signalling pathways started to develop in 2013 a more mathematical direction. This is carried out with Beagle and S. Fedotov (School Mathematics, Univ. Manchester, UK), V. Calvez (Inria Numed, Lyon), T. Lepoutre (Inria Dracula, Lyon) and Master student A. Mateos-Gonzalez (ENS Lyon, Mathematics).

DRACULA Project-Team (section vide)

IBIS Project-Team

2.2. Highlights of the Year

A paper based on the PhD thesis of Sara Berthoumieux was accepted for *Molecular Systems Biology* this year [4] and selected as an Editor's choice in *Science* (http://ibis.inrialpes.fr/article1040.html).

The start-up company BGene, created by Johannes Geiselmann and former IBIS member Caroline Ranquet, together with Marie-Gabrielle Jouan (Floralis, Université Joseph Fourier), obtained an Emergence award in the 2013 Oséo Concours d'entreprises innovantes (http://www.grain-incubation.com/oseo-start-ups-laureates-categorie-emergence/). BGene is active in the field of DNA engineering (Section 6.2).

MOISE Project-Team

2.2. Highlights of the Year

MOISE was a main contributor of the success of the MPT2013 event in France. Maëlle Nodet and Antoine Rousseau were co-authors of a movie that was presented at the MPT launch, at UNESCO. In addition, Maëlle and Antoine strongly participated to the initiative *Un jour, une brève*[1] in which Antoine was both executive editor and webmaster. This website - dedicated to scientific outreach - was visited by more than 1000 unique visitors each and every day of 2013. On the research side of MPT2013, several team members were in the main board of *Maths In Terre*[2]

[1] See http://mpt2013.fr

[2] A French national program that was built to propose ANR a national strategy regarding applied mathematics and environmental sciences, see http://mathsinterre.fr.

NUMED Project-Team (section vide)

STEEP Team (section vide)

AVALON Team (section vide)

DANTE Team

2.2. Highlights of the Year

2.2.1. Model for Time-Varying Graphs.

We propose a novel model for representing finite discrete Time-Varying Graphs (TVGs). The major application of such a model is for the modelling and representation of dynamic networks. In our proposed model, an edge is able to connect a node u at a given time instant t_a to any other node v (u possibly equal to v) at any other time instant t_b (t_a possibly equal to t_b), leading to the concept that such an edge can be represented by an ordered quadruple of the form (u, t_a, v, t_b). Building upon this basic concept, our proposed model defines a TVG as an object $H = (V, E, T)$, where V is the set of nodes, $E \subseteq V \times T \times V \times T$ is the set of edges, and T is the finite set of time instants on which the TVG is defined. We show how key concepts, such as degree, path, and connectivity, are handled in our model. We also analyse the data structures used for the representation of dynamic networks built following our proposed model and demonstrate that, for most practical cases, the asymptotic memory complexity of our TVG representation model is determined by the cardinality of the set of edges. (See [20])

2.2.2. Tight bounds on the contiguity and linearity of co-graphs.

We show that the contiguity and linearity of co-graphs on n vertices are both O(log n). Moreover, we show that this bound is tight for contiguity as there exists a family of cographs on n vertices whose contiguity is Omega(log n). We also provide an Omega(log n / log log n) lower bound on the maximum linearity of co-graphs on n vertices. As a by-product of our proofs, we obtain a min-max theorem, which is worth of interest in itself, stating equality between the rank of a tree and the minimum height of one of its path partitions. (See [3])

2.2.3. Function analysis through wavelets on dynamic contact graphs.

Parameters of the diffusion and of the mutations of nosocomial bacteria strains are still today not completely understood. The macroscopic mechanisms involved during the diffusion are opposed to microscopic mechanisms which are well known and understood. At the scale of an hospital, this is a complex system that needs to be be simplified and modelled before an epidemiological study of the whole system. We aim at giving an answer to the question of whether there exists a correlation between the contact graph (dynamic network) and the microbiological diffusion of the strains of Staphylococcus Aureus bacteria. For that purpose, the research project MOSAR (Mastering hOSpital Antimicrobial Resistance) and the i-Bird group (Individual Based Investigation of Resistance Dissemination) designed a large scale experiment that has been carried out at the Hospital of Berck-sur-Mer (FRANCE). Our work focuses on comparing the diffusion of some selected strains to the results obtained with wavelets on the aggregated contact graph, the selection being made such as the strains show a clear diffusion over time. We study the correlation between the spatial diffusion of the wavelets and the spatio-temporal diffusion of those strains.

2.2.4. Hierarchical Modelling of IEEE 802.11 Multi-hop Wireless Networks.

IEEE 802.11 is implemented in many wireless networks, including multi-hop networks where communications between nodes are conveyed along a chain. We present a modelling framework to evaluate the performance of flows conveyed through such a chain. Our framework is based on a hierarchical modelling composed of two levels. The lower level is dedicated to the modelling of each node, while the upper level matches the actual topology of the chain. Our approach can handle different topologies, takes into account Bit Error Rate and can be applied to multi-hop flows with rates ranging from light to heavy workloads. We assess the ability of our model to evaluate loss rate, throughput, and end-to-end delay experienced by flows on a simple scenario, where the number of nodes is limited to three. Numerical results show that our model accurately approximates the performance of flows with a relative error typically less than 10%.

2.2.5. Awards and honours

Hurst Exponent IntraPartum Fetal Heart Rate: Impact of Decelerations [7] was granted the best paper award in the 26th IEEE International Symposium on Computer-Based Medical Systems (CBMS).
BEST PAPERS AWARDS :
[7] **IEEE 26th International Symposium on Computer-Based Medical Systems (CBMS), 2013**. P. ABRY, S. ROUX, V. CHUDÁČEK, P. BORGNAT, P. GONÇALVES, M. DORET.

MESCAL Project-Team (section vide)

MOAIS Project-Team

2.2. Highlights of the Year

- Best Paper - HeteroPar 2013
- Best Long Paper - Second Prize at Web3D 2013

BEST PAPERS AWARDS :

[23] **Proceedings of the 11th HeteroPar workshop (Algorithms, Models and Tools for Parallel Computing and Heterogeneous Platforms)**. S. KEDAD-SIDHOUM, F. MONNA, G. MOUNIÉ, D. TRYSTRAM.

[17] **18th International Conference on 3D Web**. T. FRANKE, V. SETTGAS, J. BEHR, B. RAFFIN.

ROMA Team

2.2. Highlights of the Year

Anne Benoit, Yves Robert and Frédéric Vivien published a textbook entitled "A Guide to Algorithm Design: Paradigms, Methods, and Complexity Analysis" [40].

SOCRATE Project-Team

2.4. Highlights of the Year

2.4.1. FIT/CortexLab first on-line demonstration

FIT(Future Internet of Things) is a french Equipex (Équipement d'excellence) which aims to develop an experimental facility, a federated and competitive infrastructure with international visibility and a broad panel of customers. FIT will be composed of four main parts: a Network Operations Center (NOC), a set of Embedded Communicating Object (ECO) testbeds, a set of wireless OneLab testbeds, and a cognitive radio testbed (CorteXlab) deployed by the Socrate team in the Citi lab. In 2013 the construction of the room was finished see Figure 3 . SDR nodes have been bought after setting two call for tenders, 42 industrial PCs (Aplus Nuvo-3000E/P), 22 NI radio boards (USRP) and 18 Nutaq boards (PicoSDR, 2x2 and 4X4) will now be installed in the room. A first version of the software infrastructure has been deployed and small experimentations (involving 2 USRP nodes) have been made from various places (from Brasil, United States, Villeurbanne).

2.4.2. Socrate at Paris-Tours cycling race

France Télévisions, Euro Media France and Amaury Sport Organisation have partnered again to deliver the Paris-Tours cycling race, using a wireless sensor solution to geolocate riders in realtime. These sensors where deployed in a collaboration with HikoB (Inria/Citi-lab start-up) and Socrate who provided the distributed cyclocalisation algorithm

In what was claimed as a world first, Euro Media France equipped the 200 competitors with special HikoB sensors at the beginning of the Paris-Tours race in Authon-de-Perche. This enabled to pinpoint the exact position of every rider and feed the information in real-time.

This collaboration is now held in a FUI project called Smacs. Next demostration should occur in the tour de France in 2014 targeting full deployment at the Olympic Games of 2016 in Rio de Janeiro.

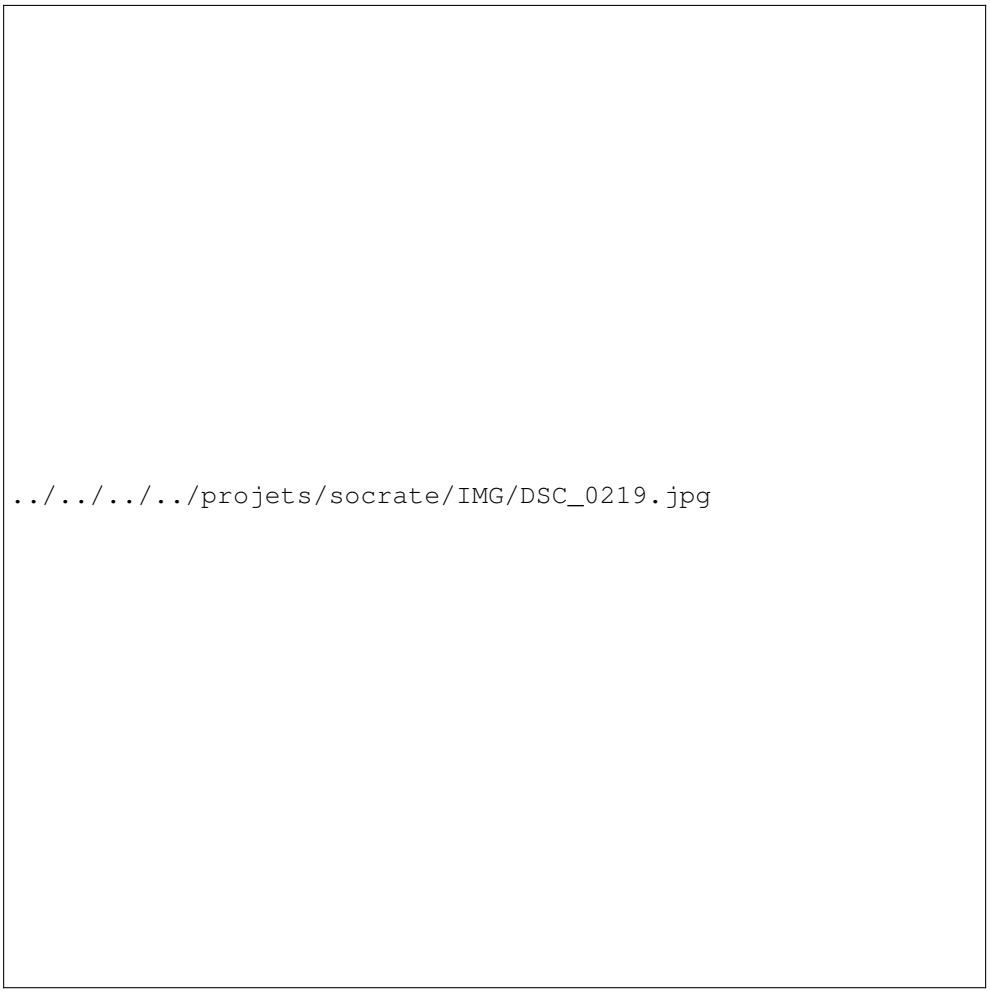

Figure 3. Photo of the FIT/CortexLab experimentation room before adding SDR *nodes to the ceiling*

URBANET Team (section vide)

E-MOTION Project-Team

2.2. Highlights of the Year

Awards :

- C . Laugier, Ph. Martinet and C. Stiller have received the “Most Active IEEE RAS Technical Committee Award of the year 2013” for the Technical Committee they are co-chairing on “Autonomous Ground Vehicles and Intelligent Transportation Systems”. This prize has been announced during the award ceremony of the annual IEEE ICRA conference in Karlsruhe.

- C. Laugier has been invited by the French Ministry of Foreign Affairs and by the Taiwan Office in Paris to participate has a French Robotics Expert, to the high level French delegation conducted by Mme Edith Cresson (former prime minister), October 2013.

- C. Laugier was a member of the Best paper Award Committee of the IEEE ICRA 2013 conference, Karlsruhe, May 2013.

- C. Laugier was chair of the Best paper Award Committee of the 5th PPNIV Workshop organized in the scope of the IEEE/RSJ IROS 2013 conference. The prize was given by the IEEE RAS Technical Committee on “Autonomous Ground Vehicles and Intelligent Transportation Systems”.

Patents:

- S. Lefevre, C. Laugier, and J. Ibanez-Guzman have submitted a patent (Inria and Renault) on “Method and process for the evaluation of the risk of collision at intersections”. The patent has initially been submitted in 2012 and finalized in 2013.

- I. Paromtchik and C. Laugier have submitted in 2013 a patent on “Method and apparatus for improving driving safety of a vehicle travelling on a road”. Patent no. 13305275.3-1803.

- S. Lefevre, C. laugier and R. Bajcsy have submitted in 2013 a patent (Inria and UC Berkeley) on "Decision Making for Collision Avoidance Systems". Patent no. 13306495.6-1810.

Invited talks:

- C. Laugier has given an invited talk entitled "Road Scene Understanding using Bayesian Perception & Risk Assessment” at the Colloquium on Intelligent Robots and Systems, Osaka, June 14th 2013.

- C. Laugier has given an invited talk entitled "Embedded Bayesian Perception and Situation Awareness for Mobile Robots” at a NTU-iCeiRA Seminar on Intelligent Robotics, Taipei, May 2013.

- C. Laugier has given an invited lecture entitled "Embedded Bayesian Perception and Situation Awareness Robots & Intelligent Vehicles” at Toyota Technological Institute, Nagoya, June 2013.

- C. Laugier has given an invited talk entitled “Embedded Perception & Risk Assessment for Intelligent Vehicles” at the Workshop “Vehicle Autonomy in Urban Transportation Systems” IEEE ICRA 2013, Karlsruhe, May 10th 2013.

- C. Laugier has given a keynote talk entitled “Road Scenes Understanding & Risk Assessment using Embedded Bayesian Perception” at the 5th PPNIV Workshop, IEEE IROS 2013, Tokyo, November 2013.

- C. Laugier has given an introductory talk entitled “Embedded Perception for Future Cars” at the Seminar In’Tech “Perception embarquée pour les véhicules de demain”, Inria Grenoble Rhône-Alpes, Grenoble, October 24th 2013.

- C. Laugier and A. Spalanzani have given a tutorial on “Autonomous Robotics” at the ISIE 2013 Conference, Taipei, May 2013.

EXMO Project-Team

2.2. Highlights of the Year

This year saw the publication of the second edition, largely revised and augmented, of our reference book *Ontology matching* [12].

IMAGINE Project-Team

2.2. Highlights of the Year

- One publication was accepted at SIGGRAPH 2013 [14], and two publications at SIGGRAPH Asia 2013 [5], [8].
- Prof. Michael Gleicher from University of Wisconsin is visiting our team during one year.
- France 3 made a video reportage about our team.
- An interview of Marie-Paule Cani was published in People of ACM.
- Marie-Paule Cani became vice chair of Eurographics.
- Computer Vision and Image Understanding 2013 Most cited paper award : *A survey of vision-based methods for action representation, segmentation and recognition*, by Daniel Weinland, Remi Ronfard and Edmond Boyer.

LEAR Project-Team

2.2. Highlights of the Year

- **TrecVid Multimedia Event Detection challenge.** We participated in the Multimedia Event Detection track of TrecVid 2013, one of the major benchmarks in automatic video analysis. We ranked first out of 18 participants [35].
- **ICCV'13 THUMOS Challenge.** We participated in the action recognition challenge THUMOS, organized in conjunction with ICCV '13. We were ranked first among 16 participants.
- **Optical Flow Benchmark SINTEL.** Our optical flow method DeepFlow [31] was ranked first to the online evaluation benchmark SINTEL from Max Planck Institute.
- **Cor Baayen Award.** Julien Mairal received the Cor Baayen prize, which is awarded annually by ERCIM to a promising young researcher in the field of Informatics and Applied Mathematics.
- **Best Phd prize.** Thomas Mensink, a former PhD student of LEAR, was awarded the best PhD thesis prize from AFRIF.

MAVERICK Project-Team

2.2. Highlights of the Year

Our paper on "Diffusion Curves" [2], originally published in 2008, was featured in the "Research Highlights" section of *Communications of the ACM* [14].

Our work on using the covariance matrix for illumination simulation, in cooperation with F. Durand at MIT, have been published in *ACM Transactions on Graphics* [5].

Our work on on efficient sampling and filtering for displacement maps and texture maps have been published at *Siggraph Asia* and *ACM Transactions on Graphics* [8]. This work was done in cooperation with University of Lyon and University of Montreal. Initial response by the community has been enthusiastic.

BEST PAPER AWARD :

[17] **I3D'13 - ACM SIGGRAPH Symposium on Interactive 3D Graphics and Games**. E. HEITZ, D. NOWROUZEZAHRAI, P. POULIN, F. NEYRET.

MORPHEO Team

2.2. Highlights of the Year

The work on human motion capture, done in collaboration with the technical university of Munich, received the best paper runner up award at the 3DV conference for the article: This work contributes to the field with an approach that recovers both the shape and the articulated pose of a human body over time sequences and using multiple videos.

BEST PAPERS AWARDS :

[7] **3DV - International Conference on 3D Vision - 2013**. C.-H. HUANG, E. BOYER, S. ILIC.

PERCEPTION Team

2.2. Highlights of the Year

2.2.1. European project HUMAVIPS.

The European project HUMAVIPS – Humanoids with Auditory and Visual Abilities in Populated Spaces – is a 36-month FP7 STREP project coordinated by Radu Horaud and which started in 2010. The project addressed multimodal perception and cognitive issues associated with the computational development of a social robot. The objective was to endow humanoid robots with audiovisual (AV) abilities: exploration, recognition, and interaction, such that they exhibit adequate behavior when dealing with a group of people. Research and technological developments emphasized the role played by multimodal perception within principled models of human-robot interaction and of humanoid behavior. The HUMAVIPS project was successfully terminated in January 2013.

An article about *Integrating Smart Robots into Society* refers to HUMAVIPS. The article stresses the role of cognition in human-robot interaction and refers to HUMAVIPS as one of the FP7 projects that has paved the way towards the concept of audio-visual robotics. The article was published in HORIZON, which is Europe's Research & Innovation Magazine.

2.2.2. ERC Advanced Grant VHIA.

The PERCEPTION team is pleased to announce that Radu Horaud was awarded an ERC Advanced Grant for his project "Vision and Hearing in Action" (VHIA). This five year project (2014-2019) will develop the concept of social robots.

2.2.3. Best Paper Award at IEEE MMSP'13.

The article received the "Best Paper Award" at the IEEE International Workshop on Multimedia Signal Processing (MMSP'13), Pula, Italy, September-October 2013. The paper addresses the problem of aligning visual and auditory data using a sensor that is composed of a camera-pair and a microphone-pair. The original contribution of the paper is a method for audio-visual data aligning through estimation of the 3D positions of the microphones in the visual centred coordinate frame defined by the stereo camera-pair. Please consult http://www.mmsp2013.org/mmsp2013_awards.php and [24].

BEST PAPERS AWARDS :

[24] **MMSP 2013 - IEEE International Workshop on Multimedia Signal Processing**. V. KHALIDOV, F. FORBES, R. HORAUD.

Prima Project-Team (section vide)

TYREX Team

2.2. Highlights of the Year

Pierre Genevès, CNRS researcher, received the bronze medal of CNRS in a ceremony organized on october 4th, 2013, in Grenoble. This medal was awarded by the CNRS INS2I institute.