Activity Report 2016

Section Highlights of the Team

VISION, PERCEPTION AND MULTIMEDIA INTERPRETATION

CEDAR Team

5. Highlights of the Year

5.1. Highlights of the Year

ERC Proposal Accepted

Y. Diao's ERC Consolidator proposal "Charting a New Horizon of Big and Fast Data Analysis through Integrated Algorithm Design" has been accepted by the EU.

Awards

- A team of five including the team's PhD student Tien Duc Cao has won the first place at the Start-up Week-End in Artificial Intelligence (SWAI) in November 2016 (https://twitter.com/i/moments/796004617410711552, http://swai.fr/).

- Šejla Čebirić has been awarded the Google Anita Borg Scholarship.

- The paper "On the Complexity of Evaluating Regular Path Queries over Linear Existential Rules." by M. Bienvenu and M. Thomazo received the best paper award at the RR'16 conference .

BEST PAPERS AWARDS :

[3] **10th International Conference on Web Reasoning and Rule Systems**. M. BIENVENU, M. THOMAZO.

DAHU Project-Team

5. Highlights of the Year

5.1. Highlights of the Year

Awards

Luc Segoufin together with Mikolaj Bojanczyk, Claire David, Anca Muscholl, and Thomas Schwentick obtained the ACM Alberto O. Mendelzon PODS Test of Time Award in 2016.

EXMO Project-Team (section vide)

<p align="center">**GRAPHIK Project-Team**</p>

4. Highlights of the Year

4.1. Highlights of the Year

- M. Bienvenu was awarded the Bronze CNRS medal 2016 http://www.cnrs.fr/ins2i/spip.php?article2197. She was an invited speaker at IJCAI 2016 (International Joint Conference in Artificial Intelligence), Early Career Spotlight track http://ijcai-16.org/index.php/welcome/view/early_career_spotlight

- Theoretical and algorithmic results on ontology-mediated query answering recognized at the best international level (10 articles in the major conferences in Artificial Intelligence and Knowledge Representation and Reasoning: IJCAI, AAAI, ECAI and KR)

- Sudoqual prototype for the evaluation of link quality in document bases considered to be used in production conditions by ABES (French Agency for Academic Libraries).

- CoGui-Capex prototype linking food descriptors to actions considered to be used in production conditions by Régilait in its milk powder factory in Macon.

4.1.1. Best papers

BEST PAPERS AWARDS :

[29] **10th International Conference on Web Reasoning and Rule Systems**. M. BIENVENU, M. THOMAZO.

LACODAM Team

5. Highlights of the Year

5.1. Highlights of the Year

- This year, we are extremely proud to have a total of 4 papers accepted at the IJCAI conference, the rank A+ conference on Artificial Intelligence.

- Another highlight of this year is that following the end of the former team, namely Dream, we could propose in 2016 a new team project, namely Lacodam, and follow smoothly all steps of the Inria project-team creation protocol. While the team is not officially created as of December 2016, our project has been positively evaluated both by Inria members and by international experts, and is thus likely to be created in early 2017.

LINKS Project-Team

5. Highlights of the Year

5.1. Highlights of the Year

Certain Query Answering as Access Control

P. Bourhis [24] presented at **LICS** — the top conference in logic in computer science — a general framework for querying databases with visible and invisible relations. This work was done in cooperation with Oxford, Santa Cruez, and Bordeaux. It generalizes in a uniform manner the problems of certain query answering and access control for relational databases. Invisible relations are subject to the open world assumption possibly under constraints, while visible relations are subject to the closed world assumption. Bourhis then shows that the problem of answering Boolean conjunctive queries in this framework is decidable, and studies the complexity of various versions of this problem. It turns out that the complexity increases compared to the problem of certain query answering, given that the closed world assumption is adopted for the added visible relations.

Five ANR Projects

Two new ANR projects were accepted this year: *Delta* and *Headwork*. This makes Links a partner of 5 ANR projects in 2016.

PhD Defense of A. Boiret

The defense of the PhD thesis of A. Boiret [11] on "Normalization and Learning of Transducers on Trees and Words" under the supervision of J. Niehren and A. Lemay was highly appreciated by the reviewers. In particular, he illustrated very clearly how to learn top-down tree transformations subject to regular schema restriction [31], [33], [34]. Furthermore, he solve a problem open for more than 20 years on how to learn rational functions, i.e. word transducers with regular lookahead.

MAGNET Project-Team

5. Highlights of the Year

5.1. Highlights of the Year

- We have been successful in many calls: ERC PoC project SOM (JAN RAMON leader), ANR project GRASP (PASCAL DENIS leader), ANR project PAMELA (MARC TOMMASI is the scientific coordinator), ANR project REM (PASCAL DENIS local leader), ADEME project MUST (JAN RAMON leader), Inria Associate Team LEGO (AURÉLIEN BELLET local leader).

- Scientific advances have been recognized by the community, in top ranked conferences and journals such as ICML, NIPS, JMLR, EMNLP, EACL and IJCAI.

5.1.1. Awards

- CHLOÉ BRAUD, who was supervised by PASCAL DENIS from 2012 to 2015, received the 2016 PhD Award from ATALA, the French NLP association.

- PAUL VANAESEBROUCK, who was supervised par AURÉLIEN BELLET and MARC TOMMASI, has reveived the "Grand Prix du stage de Recherche" from École Polytechnique Paris for his internship in MAGNET (see Section 7.1).

ORPAILLEUR Project-Team

5. Highlights of the Year

5.1. Highlights of the Year

- The conference paper got the best paper award at the International Conference on Concept Lattices and Applications 2016 in Moscow, July 2016 (https://cla2016.hse.ru/awards). This reward was given to the paper and also to the whole work on the formalization of functional dependencies done by the four authors during the last years.

- In July 2016, Chedy Raïssi visited NASA Ames and SETI Institute as part of the Frontier Development Lab. He worked there for six weeks on the planetary defense community and focused on Delay-Doppler radar imaging. This stay was organized in the framework of the NASA "Asteroid Grand Challenge" program, where participation is based on a strong selection process.

BEST PAPERS AWARDS :

[33] **Thirteenth International Conference on Concept Lattices and Their Applications (CLA 2016)**. V. CODOCEDO, J. BAIXERIES, M. KAYTOUE, A. NAPOLI.

SMIS Project-Team (section vide)

TYREX Project-Team (section vide)

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

5. Highlights of the Year

5.1. Highlights of the Year

5.1.1. Awards & Nominees

The Wimmics team received collectively the Université Côte d'Azur Award in recognition of the ISWC best demo.

Best demo award at ISWC for *Semantic Web Technologies for improving remote visits of museums, using a mobile robot* [32].

Best poster nominee at ISWC for *Materializing the Editing History of Wikipedia as Linked Data in DBpedia* [60].

Michel Buffa was finalist for the first-ever edX Prize for Exceptional Contributions in Online Teaching and Learning (11 teachers have been selected among 2500 others and 1200 online courses) for his MOOCs on HTML5.

Valerio Basile was awarded the first prize, granted by IBM, at the *Evaluation of NLP and Speech Tools for Italian (Evalita)* workshop.

<div align="center">**ZENITH Project-Team**</div>

5. Highlights of the Year

5.1. Highlights of the Year

- The Pl@ntNet application, developed by Zenith and its partners, is enjoying a huge success: more than 2.7M downloads as in November 2016 in 150 countries; the number of users doubles every 6 months; tens of thousands of users each day, 12% being professionnals in agriculture or education.

- Alexis Joly and his collaborators of the Pl@ntNet project have been awarded the prize "La Recherche 2016" organized by the French magazine La Recherche for the article [2].

ALICE Project-Team

5. Highlights of the Year

5.1. Highlights of the Year

5.1.1. Geometry processing

Meshes composed of hexahedra (deformed cubes) are desirable for certain numerical simulations, they can improve both performances and precision. They are very difficult to generate. We developed in 2010 one of the first fully automatic algorithms that generates a "hex-dominant" hybrid mesh (top part of the image), with hexahedra and other elements (colored). This year, we made a quantum leap, and significantly reduced the number of non-hex elements (bottom part of the image). Our approach is based on an optimization of a direction field [11] and a global parameterization steered by the direction field [9].
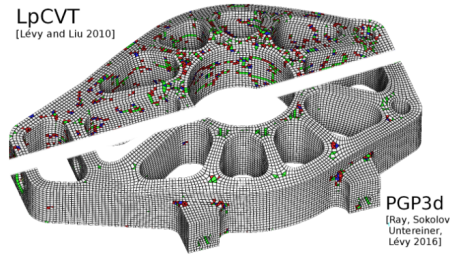

Figure 1. Improvements in hexahedral dominant remeshing.

5.1.2. Additive manufacturing

The advent of additive manufacturing enables the fabrication of shapes with unprecedented complexity, in particular embedding intricate micro-structures with details in the order of tens of microns. There is a strong interest in different fields for such structures, in medical science (prosthetics), mechanical engineering (strong but lightweight materials), art and design (aesthetics, material strength and flexibility). Unfortunately, we lack the software tools to model these structures efficiently. This year we made two significant advances in this area. We first proposed a novel methodology to create procedural micro-structures that exhibit good mechanical properties and can be fabricated [7]. As the definition of the micro-structure is procedural, they are not pre-computed. Instead their geometry is evaluated on the fly, slice after slice, during the additive manufacturing process. Yet, their elasticity can be progressively varied within the shape to align with geometric features. Our second contribution is a novel algorithm to synthesize intricate filigree patterns along a surface, from basic elements [5]. This is achieved by relaxing a strict geometric packing problem by to allow for partial overlaps between elements that preserve local geometric details. The shapes are optimized for strength during the synthesis.

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

5. Highlights of the Year

5.1. Highlights of the Year

We had a number of highlights this year:

- Aviz researchers contributed 35 publications this year. Amongst these 6 papers were presented at IEEE VIS, the largest international Visualizations and Visual Analytics conference. One full paper was presented at UIST, one the most prestigious international conference on human computer interaction;

- Aviz researchers organized two workshops at international conferences (IEEE VIS);

- Three awards were won by Aviz researchers for papers (see below);

- We welcomed four international students to our lab for research visits;

- Aviz researchers taught four lectures at various French and international universities.

5.1.1. Awards

[8]
E. DIMARA, P. DRAGICEVIC, A. BEZERIANOS.*The Attraction Effect in Information Visualization*, in "IEEE Transactions on Visualization and Computer Graphics", 2017, vol. 23, no 1 [DOI : 10.1109/TVCG.2016.2598594], https://hal.inria.fr/hal-01355750
BEST PAPERS AWARDS :
[24] **Proceedings of the Symposium on User Interface Software and Technology (UIST)**. M. LE GOC, L. H. KIM, A. PARSAEI, J.-D. FEKETE, P. DRAGICEVIC, S. FOLLMER.
[25] **IEEE VIS 2016**. S. K. BADAM, C. KINKELDEY, P. ISENBERG.

EX-SITU Team

5. Highlights of the Year

5.1. Highlights of the Year

Michel Beaudouin-Lafon received an ERC Advanced Grant: *ONE – Unified Principles of Interaction*.

Ex-situ had a record of three research papers accepted at ACM/UIST 2016 and eleven research papers accepted at ACM/CHI 2017.

GRAPHDECO Project-Team

4. Highlights of the Year

4.1. Highlights of the Year

In addition to publications in the leading conferences and journals in computer graphics (3 ACM Transactions on Graphics [5], [6], [8], 1 IEEE Virtual Reality), we made notable contributions to related fields such as human-computer interaction (1 ACM Conference on Human Factors in Computing Systems - CHI [9]) and computer vision (3 papers presented at the International Conference on 3DVision [13], [12], [10]). Several of these results were developed in the context of the CR-Play project, which was completed in November with excellent reviews.

4.1.1. *Awards*

Adrien Bousseau received a Young Researcher Award from the French National Research Agency (ANR) for the project ANR DRAO.

Adrien Bousseau obtained an ERC Starting Grant funding, the project will start in February 2017.

HYBRID Project-Team

5. Highlights of the Year

5.1. Highlights of the Year

- Two new permanent staff have joined our team this year: Ronan Gaugne (Research Engineer, Univ. Rennes 1), Ferran Argelaguet (CR2 Inria Research Scientist).
- There has been an outstanding total of six PhD Theses defended this year by members of Hybrid.
- Our team organized, together with MimeTIC team, a press conference in Paris on the "6-Finger Illusion" in May 2016, followed by a huge media coverage.

5.1.1. Awards

- Paper and demo "When the Giant meets the Ant: An Asymmetric Approach for Collaborative and Concurrent Object Manipulation in a Multi-Scale Environment" [35] obtained the Second Prize at the IEEE 3DUI Contest 2016.
- Project MANDARIN received the "Economical Impact Award 2016" from ANR (French National Research Agency).
- Project PREVIZ received a "Loading the Future' Trophy 2016" from Images et Réseaux French Competitivity Cluster.

5. Highlights of the Year

5.1. Highlights of the Year

5.1.1. Awards

- ACM CHI 2016 Honorable mention for **TouchTokens: Guiding Touch Patterns with Passive Tokens** [4], awarded to the top 5% of all 2325 paper submissions.
- IEEE InfoVis 2016 Honorable mention for **The Attraction Effect in Information Visualization** [13].

IMAGINE Project-Team

4. Highlights of the Year

4.1. Highlights of the Year

- We had one paper accepted to EUROGRAPHICS [10].

- Our work on virtual paper crumpling, published in ACM TOG paper in Dec. 2015 [5], was presented at ACM SIGGRAPH 2016 in Anaheim (July 2016). Moreover, our paper on the sound of virtual paper [24] received the best paper award at the ACM-EG Symposium on Computer Animation (SCA) 2016.

- We participated to two state of the art papers published in Computer Graphics Forum, respectively on Adaptive physically based models in computer graphics [13], and on 3D Skeletons [15].

- The paper The 2D Shape Structure Dataset: A User Annotated Open Access Database. Axel Carlier, Kathryn Leonard, Stefanie Hahmann, Geraldine Morin, Misha Collins. SMI'16, Computer & Graphics 58, pp. 23-30 (2016).received the "Reproducability Award" (http://www.reproducibilitystamp.com).

- Four students defended their PhD within the team.

- Anatoscope, the start-up founded by François Faure and Olivier Palombi, was selected by *Sud De France Dévelopement* to have a booth at the CES, Las Vegas, in January. They featured a live demonstration of the Living Book of Anatomy.

- The first FUI project Collodi with TeamTo and Mercenaries engineering terminated this year. We have successfully delivered the physics simulation engine for cloth and hair to include it in the commercial distribution of the project. A a second FUI project Collodi 2 focusing on animation is starting in December 2016.

4.1.1. Awards

BEST PAPERS AWARDS :

[24] **Eurographics/ ACM SIGGRAPH Symposium on Computer Animation (2016)**. C. SCHRECK, D. ROHMER, D. L. JAMES, S. HAHMANN, M.-P. CANI.

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

5. Highlights of the Year

5.1. Highlights of the Year

In term of publication, we are regulary publishing our work at the prestigious conference SIGGRAPH. This year was particularly successfull with two plain papers [17], [16] and one talk [19]. But this year more especially, an image from our work [16] were selected as the front cover of the corresponding special issue of ACM Transactions on Graphics.

Another great success is the creation, leaded by members of the LP2N, of a first workshop on nano-appearance. The goal of this workshop was to bring together people from the industry and the academia, and from domains that seem very different considering the scale they are interested in but close by the object of their studies: the appearance of materials. A rare initiative, this workshop took place during two days in November 2016.

MAVERICK Project-Team

5. Highlights of the Year

5.1. Highlights of the Year

5.1.1. Presentations at Siggraph

The paper "Flow-Guided Warping for Image-Based Shape Manipulation" co-authored by Romain Vergnes and Georges-Pierre Bonneau was presented at Siggraph 2016 [3]. The paper is completed by an open-source software running on mobile phones that allow interactive manipulation of images (http://bonneau.meylan.free.fr/ShwarpIt/ShwarpIt.html). See sections 6.7 and 7.1.3 .

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

5. Highlights of the Year

5.1. Highlights of the Year

This year, we feature four of the team's research results as specific highlights, in particular due to their high publication impacts.

Our work entitled "Validation of an ergonomic assessment method using Kinect data in real workplace conditions" ([15] by Pierre Plantard, Hubert PH Shum, Anne-Sophie Le Pierres and Franck Multon) has been accepted in the journal Applied Ergonomics. This publication is very important for future works in ergonomics as it demonstrates the relevance of the Kinect data correction for in-site (on a real workstation in factories) in an ergonomic purpose.

A State of the art paper, "Muscle-Based Control For Character Animation" has been published in Computer Graphics Forum ([6] by Ana Lucia Cruz Ruiz, Charles Pontonnier, Nicolas Pronost and Georges Dumont). It presents an organized review of over a decade of research in muscle-based control for character animation, its fundamental concepts and future directions for development. The core of this review contains a classification of control methods, tables summarizing their key aspects, and popular neuromuscular functions used within these controllers.

Our work entitled "Perceptual Effect of Shoulder Motions on Crowd Animations" ([11] by Ludovic Hoyet, Anne-Hélène Olivier, Richard Kulpa and Julien Pettré) has been accepted and presented in SIGGRAPH 2016, the premier and most selective computer graphics scientific event, and published in ACM Transaction on Graphics. It explores how local interactions between walkers are perceived by users when secondary shoulder motions are displayed, and demonstrates the benefits of such secondary animations in large-scale crowd scenarios.

Two papers exploring the effects of the avatar's representation on users' sense of "virtual embodiment" (i.e., the extent to which we accept an avatar to be our representation in the virtual environment) were published in Frontiers in Robotics and AI [10] and in IEEE VR [19], resulting from a collaboration between Ludovic Hoyet (MimeTIC), and Ferran Argelaguet and Anatole Lécuyer (Hybrid). This work paves the way to further collaborations on understanding how we accept virtual characters as our own representation in virtual environments.

5.1.1. *Awards*

This year, the ANR Entracte leaded by CNRS/LAAS received the best price for ANR Project in November 2016 in Paris ("Grand prix du Numérique des 10ans de l'ANR", link).

The ANR Jeune Chercheur project Cinecitta, led by Marc Christie, has also been awarded one of the 10 "iconic" projects (*projets emblématiques*) for the 10 years of the ANR, and will be presented at the 10 years celebration of the ANR in December 2016.

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

4. Highlights of the Year

4.1. Highlights of the Year

4.1.1. *Evita*

EVITA is a tactile feedback tablet, produced by Hap2U SME company, based in grenoble. It is presented at CES in january 2017, the SME has been awarded a CES innovation award. This device is issued from a strong collaboration with MINT group. Eric Vezzoli PhD thesis, contributed significantly to this device. EVITA is a very generic interaction device, and several projects are currently being discussed for understanding the fields of applications of this device. It is also, in particular, the hardware support for our haptic book for children, described below, that is our second highlight for this raweb.

4.1.2. *Haptic book*

The first digital book augmented with a high fidelity feedback has been released in October 2016. Based on a scenario and illustrations made by Dominique Maes - an artist from Belgium - this haptic book was presented for the first time during "la nuit des bibliothèques" in Lille. The popularity of this project as well as its possible social outcomes were underlined in a paper in a national magazine ("Science et Avenir", November 2016)

4.1.3. *Forum Oeuvres et Recherches*

MINT played an active role in the "Oeuvres et recherches" project (http://www.cristal.univ-lille.fr/oeuvres-et-recherches/), a platform that aims at higlighting and supporting collaborations between researchers and artists in the Hauts-de-France and in Belgium. Since 2010, these collaborations have resulted in significant contributions for these two communities at the regional and national levels. Organised at the Université de Lille on December 2nd 2016, the F O O R event was an opportunity to review more than five years of art-science projects in the region and Belgium, highlighted more than 40 art-science projects, and more importantly to prepare the future and discuss strategies for supporting such projects.

4.1.4. *ControllAR*

The ControllAR project, started in 2016, investigates the appropriation of visual feedback on control surfaces for multimedia production systems. It has already yielded many results. The system and results of a study on electronic musicians were presented both as a paper and as a demo at the ACM Internation conference on Surfaces and Spaces (ISS 16) where it received a best demo award. The software was released and is available at http://forge.lifl.fr/ControllAR. ControllAR was also presented during multiple events, both for the general public and for electronic musicians. The project continues with the design of a portable hardware solution and a long term study of the effects of the system on musicians' playing techniques.

4.1.5. *Awards*

- Best demo award for *ControllAR : appropriation of visual feedback on control surfaces* [16] @ ACM International Conference on Interactive Surfaces and Spaces (ISS 16).

- Best work in progress at Eurohaptics 2016 for the work The human perception of transient frictional modulation, David Gueorguiev, Eric Vezzoli, André Mouraux, Betty Semail, Jean-Louis Thonnard

- SME Hap2U had a "CES innovation award", based on the collaboration that MINT group has with them (E-vita tactile feedback tablet) at CES (january 2017).

<center>**Mjolnir Team**</center>

5. Highlights of the Year

5.1. Highlights of the Year

5.1.1. Personnel

Mathieu Nancel joined us as an Inria researcher in November.

Marcelo Wanderley joined us in February as part of the Inria International Chair program and will spend 20% of his time with us until 2020.

Ed Lank, Associate Professor at the University of Waterloo, joined us in September for a long-term visit (10+ months) funded by Région Hauts-de-France and Université Lille 1.

In partnership with Campus France and Inria, Mitacs' Globalink Research Award program sponsored the visits of three canadian students in our group: Nicholas Fellion (Carleton University), Hrim Mehta (Ontario Institute of Technology) and Aakar Gupta (University of Toronto).

5.1.2. Publications & dissemination

Mjolnir presented seven papers and one "late-breaking work" at the ACM CHI 2016 conference in May, the most prestigious conference in our field.

The *Animated transitions* web site launched in March illustrates previous works by Fanny Chevalier and others on this topic (Histomages, Diffamation and Gliimpse).

5.1.3. Awards

"Honorable mention" (top 5% of the 2300+ submissions) from the ACM CHI 2016 conference to the following three papers:

- "Egocentric analysis of dynamic networks with EgoLines", from J. Zhao, M. Glueck, F. Chevalier, Y. Wu & A. Khan
- "Modeling and understanding human routine behavior", from N. Banovic, T. Buzali, F. Chevalier, J. Mankoff & A. Dey
- "Direct manipulation in tactile displays", from A. Gupta, T. Pietrzak, N. Roussel & R. Balakrishnan

"Springer award for best doctoral contribution" to Amira Chalbi-Neffati at the IHM 2016 conference.
BEST PAPERS AWARDS :
[40] **CHI '16 - Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems**. J. ZHAO, M. GLUECK, F. CHEVALIER, Y. WU, A. KHAN.
[23] **ACM CHI Conference on Human Factors in Computing Systems 2016**. N. BANOVIC, T. BUZALI, F. CHEVALIER, J. MANKOFF, A. K. DEY.
[29] **CHI 2016 - Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems**. A. GUPTA, T. PIETRZAK, N. ROUSSEL, R. BALAKRISHNAN.

POTIOC Project-Team

5. Highlights of the Year

5.1. Highlights of the Year

- ERC Grant "BrainConquest : Boosting Brain-Computer Communication with high Quality User Training" (Fabien Lotte)

- EFRAN project e-tac "Tangible and augmented interface for collaborative learning" (Martin Hachet)

- First book in French about BCI [50] [51] (Fabien Lotte)

- First accessible MOOC on "Accessibilité numérique" https://www.fun-mooc.fr/courses/inria/41012/session01/about (Pascal Guitton)

TITANE Project-Team

5. Highlights of the Year

5.1. Highlights of the Year

5.1.1. Awards

We obtained a Proof of Concept grant from the European Research Council, entitled TITANIUM (Software Components for Robust Geometry Processing). The TITANIUM project aims to develop a software demonstrator for geometry processing and 3D urban modeling, in order to facilitate the pre-commercialization of novel software components for the Computational Geometry Algorithms Library. The demonstrator will include novel approaches resulting from the ERC-funded IRON project.

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BEST PAPERS AWARDS :

[] **Computer Graphics Forum**. Z. SHI, P. ALLIEZ, M. DESBRUN, H. BAO, J. HUANG.

4. Highlights of the Year

4.1. Highlights of the Year

In 2016, Alpage has obtained several new national fundings: the team is the leader of a new ANR project (Parsiti), and a partner of a new ANR project (Profiterole) and of a new ANR-NSF project (MCM-NL).

MULTISPEECH Project-Team

5. Highlights of the Year

5.1. Highlights of the Year

We ranked 1st ex aqueo for the "Professionally produced music recordings" task of the 2016 Signal Separation Evaluation Campaign (SiSEC) [39].

PANAMA Project-Team

5. Highlights of the Year

5.1. Highlights of the Year

5.1.1. Awards

Antoine Deleforge (new PANAMA team member), Florence Forbes (MISTIS team) and Radu Horaud (PERCEPTION team) received the 2016 Hojjat Adeli Award for Outstanding Contributions in Neural Systems for their paper [70].

A. Deleforge, F. Forbes, and R. Horaud, "Acoustic space learning for sound-source separation and localization on binaural manifolds," *International journal of neural systems*, vol. 25, no. 01, 2015, https://hal.archives-ouvertes.fr/hal-00960796

The Award for Outstanding Contributions in Neural Systems established by World Scientific Publishing Co. in 2010, is awarded annually to the most innovative paper published in the previous volume/year of the International Journal of Neural Systems.

SEMAGRAMME Project-Team (section vide)

<p style="text-align:center; color:red;">**CHROMA Team**</p>

5. Highlights of the Year

5.1. Highlights of the Year

- Laetitia Matignon, Associate Professor at Université de Lyon and LIRIS Lab has obtained an Inria delegation to join the Chroma team (half-time).

- Stephane d'Alu, research engineer at CITI lab., has joinded the team for one year, half-time.

- Christian Laugier is a co-author with A. Broggi, A. Zelinski and U. Ozguner, of the chapter "Intelligent Vehicles" of the 2nd edition of the "Hanbook of Robotics" edited by B. Sicilano and O. Khatib and published in July 2016.

- A new collaboration has been built with the team of Gabriella Czibula, from University of Babes-Bolyai in Cluj-Napoca, Romania. We obtained a bilateral french-romanian PHC project, called DRONEM, to support the collaboration for the period 2017-2018.

- A new collaboration has been built with the Volvo Group in Lyon, through the co-supervision of the PhD thesis of Guillaume Bono funded by the INSA-Volvo Chair.

- A new collaboration has been built with the GIPSA Lab in Grenoble and the team of Gerard Bailly (CNRS), through the co-supervision of the PhD thesis of Remi Cambuzat funded by the Region.

- The Chroma team has been reconducted for 2017 as a Nvidia CUDA lab, for his work related to "embedded perception and autonomous vehicles".

- A new Research contract on "robust sensor fusion involving vision data" has been signed with Toyota Motor Europe in 2016. The results have been patented by Inria and Toyota.

- The results obtained in the scope of the Research contract on "autonomous driving" have been patented by Inria, Insa and Toyota.

- Acquisition of a Pepper robot, funded by INSA de Lyon and CITI-Inria lab., and acquisition of 4 Crazyflies robots, funded by the CITI lab.

5.1.1. Awards

- Christian Laugier was awarded IROS Fellow at IROS 2016 and recieved the IROS Distinguished Award citation for his Outstanding Services to IROS Advisory/Steering Committee and IROS Conferences.

DEFROST Team

5. Highlights of the Year

5.1. Highlights of the Year

New Research scientist

Olivier Goury was selected to join the team as new Inria research scientist.

Robosoft Grand Challenge

The team participated in the Robosoft Week in Livorno, with a workshop on simulation of soft robots held by Christian Duriez, Thor Bieze and Eulalie Coevoet. In addition, 2 prototypes were presented to the Robosoft Grand Challenge, reaching the 4th place of the competition.
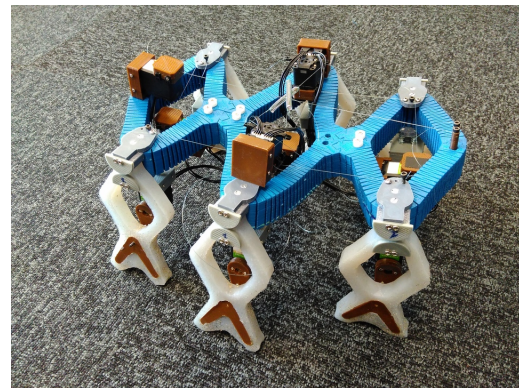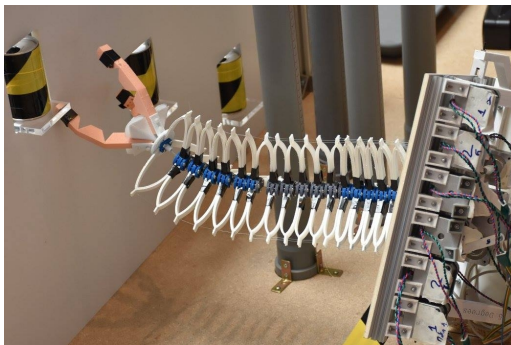

Figure 2. (a) EchelonIII (b) SOFIA

ERC evaluation grade A

The project COMOROS submitted for ERC Consolidator "fully met the ERC's excellence criterion" and evaluated as grade A. Unfortunately, it could not be funded, given the available budgetary resources of ERC for the call. But the region Haut-De-France should be able to finance a part of the project during the 3 coming years thanks to the FEDER funds.

FLOWERS Project-Team

5. Highlights of the Year

5.1. Highlights of the Year

The Flowers team spin-off company Pollen Robotics was created in may 2016, targeting to develop and commercialize technologies for entertainment robotics: http://pollen-robotics.com/en/

Didier Roy was award the prize Serge Hocquenguem for his work on educational robotics, http://psh.aid-creem.org/spip.php?rubrique1 et http://binaire.blog.lemonde.fr/2016/12/09/pourquoi-didier-et-eva-jouent-avec-le-meme-robot/

Sébastien Forestier, Yoan Mollard, Damien Caselli and Pierre-Yves Oudeyer obtained the notable mention demonstration award (2nd place) at the NIPS 2016 conference for their demonstration on Autonomous exploration, active learning and human guidance with open-source Poppy humanoid robot platform and Explauto library https://hal.inria.fr/hal-01404399/document

PY. Oudeyer and M. Lopes co-organized with J. Gottlieb and T. Gliga the Second Interdisciplinary Symposium on Information-Seeking, Curiosity and Attention (Neurocuriosity 2016) in London, gathering 150 researchers from neuroscience, psychology, education and machine learning/computational modelling. This was achieved in the context of the associated team Neurocuriosity. Web: https://openlab-flowers.inria.fr/t/second-interdisciplinary-symposium-on-information-seeking-curiosity-and-attention-neurocuriosity-2016/187

PY. Oudeyer and M. Lopes were awarded a 3 year-long HFSP grant with J. Gottlieb (Univ. Columbia, US) and C. Kidd (Univ. Rochester, US) for a research program targeting the understanding of active exploration in humans and monkeys through experimentation and modelling. Web: https://flowers.inria.fr/neurocuriosityproject/.

PY. Oudeyer was awarded the Lifetime Achievement Award from the Evolutionary Linguistics Association.

HEPHAISTOS Project-Team

5. Highlights of the Year

5.1. Highlights of the Year

5.1.1. Science

- strong advances on the analysis of cable-driven parallel robots (section 7.1.1)
- collaboration with lawyers on the ethical and legal aspects of robotics
- strong collaboration with the medical community on walking analysis, rehabilitation (section 7.2.3) and activities detection (section 7.2.1)

5.1.2. Experimentation

- extensive test period for our walkers in clinical environment (section 7.2.3)
- start of the daily activities monitoring in a retirement house (section 7.2.1)

5.1.3. Transfer

- contract with Ellcie-Healthy for the evaluation of connected objects

5.1.3.1. Awards

- J-P. Merlet has been a finalist for the best paper award of the Eucomes conference and of the IROS conference

BEST PAPERS AWARDS :

[14] **Eucomes**. J.-P. MERLET.

[10] **IEEE Int. Conf. on Intelligent Robots and Systems (IROS)**. J.-P. MERLET.

<p style="text-align:center;color:red;font-weight:bold;">LAGADIC Project-Team</p>

5. Highlights of the Year

5.1. Highlights of the Year

- Eric Marchand and Fabien Spindler co-authored with Prof. Hideaki Uchiyama (Kyushu Univ., Japan) a survey on pose estimation for augmented reality published in IEEE Trans. on Visualization and Computer Graphics [33].

- The second edition of the Springer Handbook of Robotics has been released this year. It contains an extended version of the chapter on visual servoing co-authored by François Chaumette, Prof. Seth Hutchinson (UIUC, Illinois) and Prof. Peter Corke (QUT, Brisbane, Australia) [77].

5.1.1. Awards

- The ANR project ENTRACTE, of which Julien Pettré is partner, has received the "ANR Grand Prix du Numérique 2016". The project is about anthropomorphic action planning and understanding: http://www.agence-nationale-recherche.fr/?Project=ANR-13-CORD-0002 (see also Section 9.2.3).

- Paper [71] has been selected has one of the five finalists for the ICARCV'2016 Best Paper Award.

- Lagadic is a member of the five finalist teams for the KUKA Innovation Award (https://www.kuka.com/en-de/press/events/kuka-innovation-award), together with the RIS group at LAAS (coordinator), the University of Siena, Italy, and the Seoul National University, South Korea. The goal is to address search and rescue operations in regions which are difficult to access or dangerous following disasters. For this, the team will explore the collaboration between a quadrotor UAV and a KUKA lightweight arm for cooperative transportation and manipulation of rigid objects (e.g., long bards), with a final peg-in-hole task to be demonstrated live at the Hannover fair during spring 2017.

LARSEN Team

5. Highlights of the Year

5.1. Highlights of the Year

5.1.1. Awards

- "Prix La Recherche 2016" (mention "sciences de l'information"), to Jean-Baptiste Mouret and his co-authors (Antoine Cully, Jeff Clune, Danesh Tarapore) for the article "Robots that can adapt like animals" (Nature, 2015).
- "2016 ISAL Award for Outstanding Paper of 2015 in the field of Artificial Life", awarded by the International Society for Artificial Life to Jean-Baptiste Mouret and his co-authors (Antoine Cully, Jeff Clune, Danesh Tarapore) for the article "Robots that can adapt like animals" (Nature, 2015).

PERVASIVE INTERACTION Team (section vide)

RITS Project-Team (section vide)

4. Highlights of the Year

4.1. Highlights of the Year

- Josiane Zerubia is IEEE Signal Processing Society Distinguished Lecturer for 2016 and 2017, see (http://signalprocessingsociety.org/newsletter/2015/11/sps-announces-2016-class-of-distinguished-lecturers/)

- Josiane Zerubia received the Excellency Prize of UCA (Université Cote d'Azur) for her outstanding research work in December 2016.

- Nazre Batool who was an Inria post-doc in AYIN till May 2015 received the IEEE R8 Women in Engineering Clementina Saduwa 2016 award, see (http://www.femmesetsciences.fr/actualites/nazre-batool-prix-clementina-saduwa-2016/)

- Josiane Zerubia, in collaboration with Gabriele Moser from University of Genoa (Italy), edited a book of more than 400 pages on mathematical models for remotely sensed image processing [11] which was submitted to Springer Verlag in December 2016 and will be published early 2017. They also contributed to two chapters of this book.

LINKMEDIA Project-Team

5. Highlights of the Year

5.1. Highlights of the Year

LINKMEDIA ranked first at the TRECVid 2016 Hyperlinking international benchmark [12].

LINKMEDIA is selected as the organizer of the IEEE Workshop on Information Forensics and Security in 2017.

LINKMEDIA deeply involved in the winning bid for the organization of the ACM Conf. on Multimedia in 2019.

MAGRIT Project-Team (section vide)

MORPHEO Project-Team

5. Highlights of the Year

5.1. Highlights of the Year

5.1.1. Awards

The work on estimating the visual contrast on a 3D mesh has been awarded the best paper award at the Pacific Graphics 2016 conference.

BEST PAPERS AWARDS :

[] **Computer Graphics Forum**. G. NADER, K. WANG, F. HÉTROY-WHEELER, F. DUPONT.

PERCEPTION Project-Team

4. Highlights of the Year

4.1. Highlights of the Year

- **The three-year FP7 STREP project *Embodied Audition for Robots* successfully terminated in December 2016**. The project has addressed the problem of robot hearing, more precisely, the analysis of audio signals in complex environments: reverberant rooms, multiple users, and background noise. In collaboration with the project partners, PERCEPTION contributed to audio-source localization, audio-source separation, audio-visual alignment, and audio-visual disambiguation. The humanoid robot NAO has been used as a robotic platform and a new head (hardware and software) was developed: a stereoscopic camera pair, a spherical microphone array, and the associated synchronization, signal and image processing software modules.

- This year, PERCEPTION started a one year collaboration with the **Digital Media and Communications R&D Center, Samsung Electronics** (Seoul, Korea). The topic of this collaboration is *multi-modal speaker localization and tracking* (a central topic of the team) and is part of a strategic partnership between Inria and Samsung Electronics.

4.1.1. Awards

- **Antoine Deleforge** (former PhD student, PANAMA team), **Florence Forbes** (MISTIS team) and **Radu Horaud** received the **2016 Award for Outstanding Contributions in Neural Systems** for their paper: "Acoustic Space Learning for Sound-source Separation and Localization on Binaural Manifolds," International Journal of Neural Systems, volume 25, number 1, 2015. The Award for Outstanding Contributions in Neural Systems established by World Scientific Publishing Co. in 2010, is awarded annually to the most innovative paper published in the previous volume/year of the International Journal of Neural Systems.

- **Xavier Alameda-Pineda** and his co-authors from the University of Trento received the **Intel Best Scientific Paper Award** (Track: Image, Speech, Signal and Video Processing) for their paper "Multi-Paced Dictionary Learning for Cross-Domain Retrieval and Recognition" presented at the 23rd IEEE International Conference on Pattern Recognition, Cancun, Mexico, December 2016 .

BEST PAPERS AWARDS :

[41] **IEEE International Conference on Pattern Recognition**. D. XU, J. SONG, X. ALAMEDA-PINEDA, E. RICCI, N. SEBE.

SIROCCO Project-Team

5. Highlights of the Year

5.1. Highlights of the Year

5.1.1. Awards

C. Guillemot has been granted an ERC advanced grant for a project on computational light fields imaging.

STARS Project-Team (section vide)

THOTH Project-Team

5. Highlights of the Year

5.1. Highlights of the Year

5.1.1. Awards

- Cordelia Schmid received the Humboldt Research Award, granted by the Alexander von Humboldt Foundation.
- Cordelia Schmid was awarded the Longuet-Higgins Prize at CVPR 2016 for the paper co-authored with Svetlana Lazebnik (University of Illinois at Urbana-Champaign) and Jean Ponce (ENS Paris/Inria) entitled "Beyond bags of features: spatial pyramid matching for recognizing natural scene categories".
- Cordelia Schmid was awarded the Inria - Académie des Sciences Grand Prize 2016.
- Thoth is one of the recipients of a hardware donation in the Facebook AI Research Partnership Program.
- Julien Mairal was awarded one of the ERC starting grants 2016.

WILLOW Project-Team

5. Highlights of the Year

5.1. Highlights of the Year

5.1.1. Awards

- Jean Ponce (together with Svetlana Lazebnik and Cordelia Schmid) received the Longuet-Higgins Prize for "Fundamental contributions in Computer Vision", awarded at the IEEE Conference on Computer Vision and Pattern Recognition, 2016.