

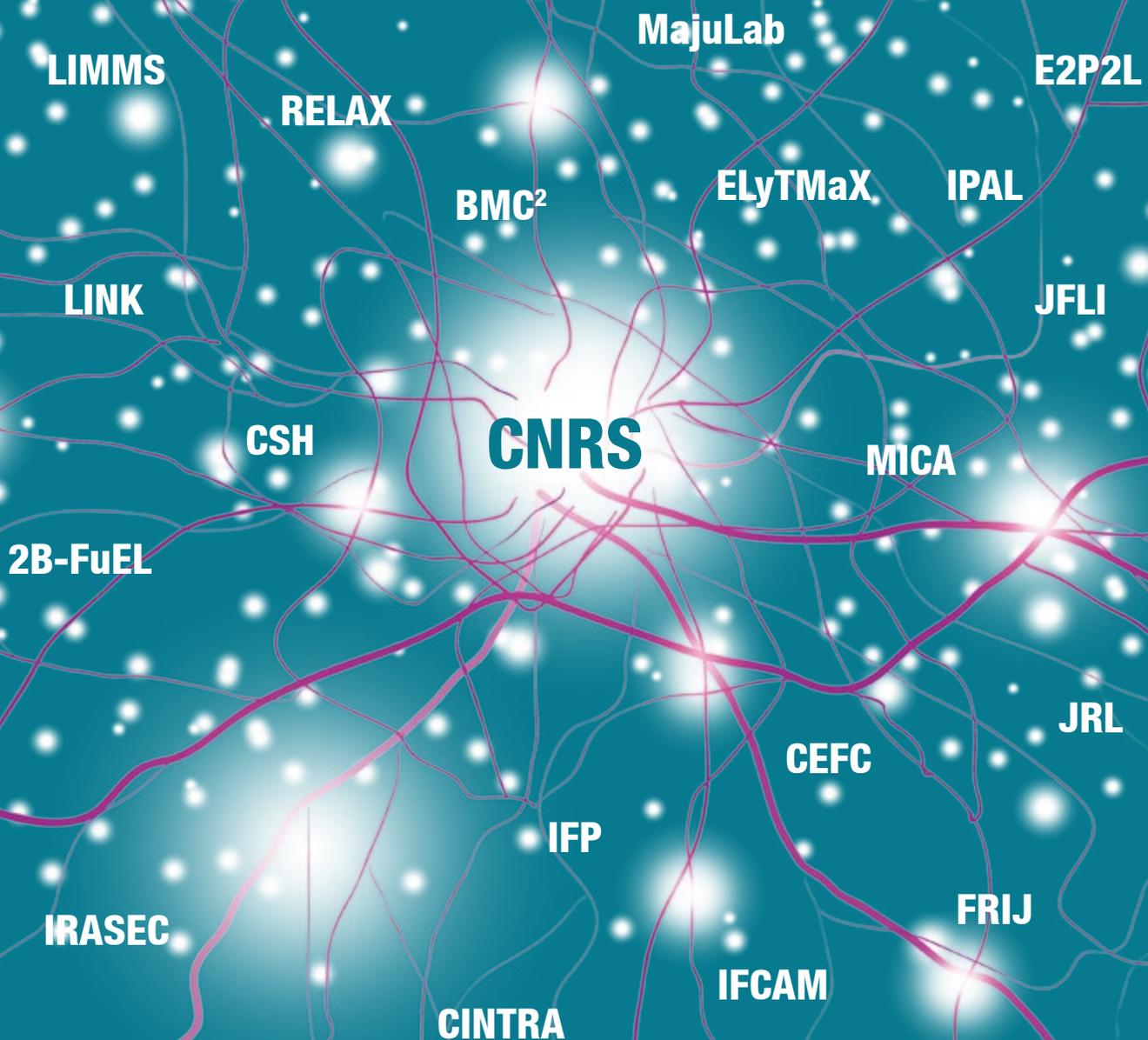


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Exploring the frontiers of science
Designing innovative international partnerships
Building a community

Shanghai, 28-29 November

AUR@SIA 2017 UMI-UMIFRE Profiles & Directors' Interviews



Foreword

The Word of the UMI and UMIFRE

In the context of increasing globalisation of knowledge and internationalisation of research and innovation, the renown of the CNRS as global key player is now well established. Each year, 30% of recruited researchers come from foreign countries. In the same vein, the rate of co-publications between French researchers and foreign colleagues is 60% which is worth emphasising.

The CNRS's international strategy is therefore structured around three transversal principles:

- Promote and carry out excellent research through a network of international research units in various fields such as chemistry, physics, computer science, mathematics, humanities and engineering.
- Integrate the research into a global approach, transversal to disciplinary fields and integrated into the academic traditions of the partner countries.
- Support and strengthen the international commitment of research teams in global consortia that address major global changes. This support is both ensuring that research is well carried out and promoting the role of science in the society by pledging the link between fundamental research, valorization and public-private partnership

One real tangible measure of the position of the CNRS at international level is the outstanding success our units abroad – UMI and UMIFRE – are experiencing across the world. UMI and UMIFRE are International joint units designed to optimize and structure the partnerships with foreign partners, UMIFRE having the particularity of involving on the French side the Ministry of Europe and Foreign Affairs. Through this original tool, the CNRS devotes significant attention to organise and facilitate cooperation and mutual exchange of scientists and ideas. Today, there are 36 UMI scattered around the world with other international public and private partners undertaking breakthrough science and innovation. UMI are also the place to learn doing excellent and international science. Each year, it allows young researchers to benefit from the support of the CNRS and gain valuable learning and working experience.

In Asia, the CNRS is a global research player in every scientific discipline. While initial contacts are generally made by researchers themselves—thus reflecting the international nature of research—we strive to structure and sustain partnerships over time. To this end, the CNRS is involved in 105 international programs for scientific cooperation (PICS) and joint research projects (PRC), 45 international associated laboratories (LIA), 19 international research networks (GDRI) and 20 UMI or UMIFREs, which can be seen as the ultimate stage of international research structuration.

The CNRS is proud to count these 20 units caring out research in all fields of knowledge and tackling global challenges to bring social, cultural, and economic benefits for society. In physical sciences, for example and just to list a few, the success story of the UMI LIMMS, based in Japan, which became a jewel of French-Japanese cooperation and able to stake out strong positions and publish high quality and well-known publications is iconic. Together with other units in Japan, CNRS managed to establish a performing ecosystem allowing academic research and collaboration with industries to thrive in the long run. In Singapore, the Thales/CNRS UMI is also very promising although less visible.

In China, Japan, Korea, Vietnam, India and Singapore, we value the partnerships that flourished with great partners in science driven context. And the CNRS is very happy to contribute to creating an atmosphere where research institutions, academics and industries work in the spirit of partnership and mutual understanding. This science-friendly environment allowed researches to spontaneously tackle Global Goals set of in the UN strategy Transforming our world: the 2030 Agenda for Sustainable Development.

In the following pages, you will have the opportunity to enter this outstanding research network. Each UMI and UMIFRE will be first outlined in a sheet explaining its research problematic and characteristics. An interview of the director will complement the presentation and hopefully show you that UMI are also a great human adventure.

We are delighted to introduce you to the diversity and richness of our international partnership.

Anne Peyroche
CNRS President



UMI/UMIFRE : How does it work?

What is a UMI? What is a UMIFRE?

A UMI is a full-fledged laboratory, as found in universities and research organizations. It is based in a single location, in France or abroad, and brings together researchers, students, postdocs, and support staff from the CNRS and partner institution(s). The director of the UMI is jointly named by the CNRS and the foreign partner institution(s).

A UMIFRE («French Research Institutes Abroad») is a joint unit between the CNRS and the French Ministry of Europe and Foreign Affairs. UMIFRE follow a specific path between CNRS and the Ministry of Europe and Foreign Affairs for submission, evaluation and funding.

How long does a UMI last?

Five years, renewable after evaluation of the UMI activity.

Who can submit a UMI proposal?

An application to create a UMI must be submitted by its future director (a researcher or professor) to both the CNRS and the partner institution abroad.

How and when to submit a proposal?

Requests to set up a UMI can be made at any time to the relevant thematic institute of the CNRS and the partner institution abroad. The application file includes a research proposal and a provisional budget plus total cost for 5 years.

How are proposals evaluated?

Scientific evaluation of proposals is carried out simultaneously by peer review, at the CNRS and at the partner institution. The selection of UMI is competitive and based on mutual agreement between the partners.

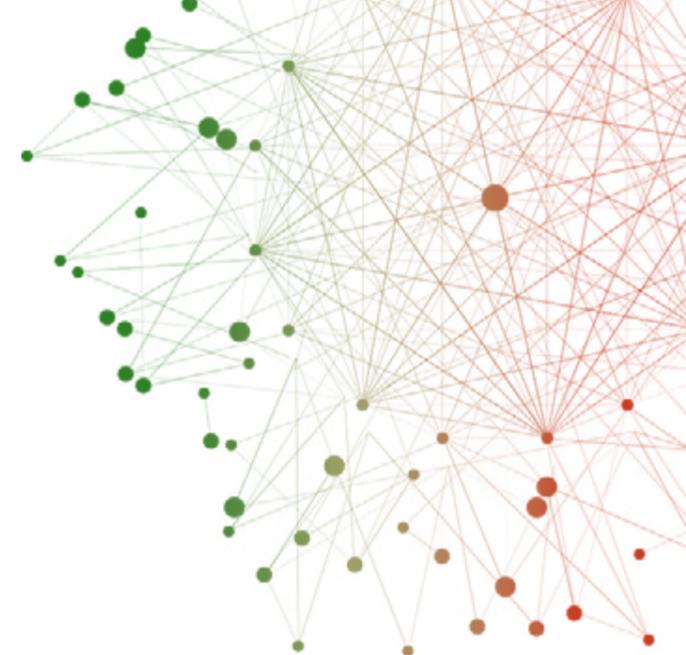
As UMI have the same status as the CNRS units, decisions concerning their creation must be ratified by the President of the CNRS.

Once the decision to create a UMI has been made, a contract, with research project description, consolidated provisional budget, management rules and intellectual property provisions is signed by the President of CNRS and by the heads of the foreign partner institution.

How is a UMI funded?

Human and material resources are provided to the UMI by the CNRS and the partner institution(s), in addition to funding from other sources, such as other research organizations, foundations, and private companies. The salaries of researchers, Ph.D. students, postdocs and support staff are covered, as are equipment, running costs, research trips, and infrastructure expenses.

These expenses are jointly covered by the partners according to an annual provisional budget, following consultation between the administrative and scientific authorities in both countries.



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Centre for Social Science and Humanities

UMI IFCAM
Indo-French Center for Applied Mathematics

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French Institute of Pondicherry

UMI RELAX
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Engineering Science Lyon – Tohoku for Materials and Systems under Extreme Conditions

UMIFRE FRIJ
French Research Institute on Japan (UMIFRE 19)

UMI JFLI
Japanese-French Laboratory for Informatics

UMI JRL
Joint Robotics Laboratory

UMI LIMMS
Laboratory for Integrated Micro Mechatronic Systems

UMI LINK
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UMI 2B-FuEL
Building Blocks for Future Electronics Laboratory

SINGAPORE 34-41

UMI BMC²
BioMechanisms of Cellular Contacts

UMI CINTRA
CNRS International NTU THALES Research Alliance

UMI IPAL
Image & Pervasive Access Laboratory

UMI MAJULAB
France Singapore Quantum Physics and Information Laboratory

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Research Institute on Contemporary Southeast Asia

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UMI MICA
Multimedia Information Communication and Applications

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CHINA

>CEFC - Humanities & Social Sciences (INSHS)
French Centre for Research on Contemporary China
www.cefc.com.hk

>E2P2L - Chemistry (INC)
Eco-Efficient Products & Processes Laboratory
Solvay
www.e2p2l.com

>LIAMA - Information Sciences (INS2I)
Sino-European Laboratory of Informatics, Automation and Applied Mathematics
INRIA, CASIA
<http://liama.ia.ac.cn/>

INDIA

>CSH - Humanities & Social Sciences (INSHS)
Centre for Social and Humanities Sciences
www.csh-delhi.com

>IFP - Humanities & Social Sciences (INSHS)
French Institute of Pondicherry
www.ifpindia.org

>IFCAM - Mathematics (INSMI)
Indo-French Center for Applied Mathematics, DST
www.math.iisc.ac.in/~ifcam/

>RELAX - Information Sciences (INS2I)
Indo French Research Lab in Computer Science
CNRS, ENS Paris-Saclay, Université de Bordeaux, CMI, IMSc

THAILAND

>IRASEC - Humanities & Social Sciences (INSHS)
Research Institute on Contemporary Southeast Asia
www.irasec.com

SINGAPORE

>IPAL - Information Sciences (INS2I)
Image & Pervasive Access Laboratory
NUS, A*STAR, UPMC, UGA, IMT
www.ipal.cnrs.fr

>MajuLab - Physics (INP)
France Singapore Quantum Physics and
Information Laboratory
NUS, NTU, Université de Nice Sophia-Antipolis
www.majulab.cnrs.fr

KOREA

>2B-FuEL - Chemistry (INC)
Building Blocks for Future Electronics Laboratory
UPMC, Yonsei University, Ewha Womans University

JAPAN

>FRIJ - Humanities & Social Sciences (INSHS)
French Research Institute on Japan
www.ifre.fr/c/225

>LIMMS - Engineering & Systems (INSIS)
Laboratory for Integrated Micro Mechatronic Systems
University of Tokyo
www.limmshp.iis.u-tokyo.ac.jp

>JRL - Engineering & Systems (INSIS)
Joint Robotics Laboratory
AIST
<https://jrl-umi3218.github.io/>

>JFLI - Information Sciences (INS2I)
Japanese-French Laboratory for Informatics
NII, Keio University, University of Tokyo, UPMC, Inria
<http://jfli.cnrs.fr/>

>LINK - Chemistry (INC)
Laboratory for INnovative Key materials and structures
Saint-Gobain, NIMS
<http://www.nims.go.jp/eng/collaboration/hdfqf10000083jv1.html>

>ELyTMaX - Engineering & Systems (INSIS)
Engineering & science Lyon Tohoku joint laboratory for
Materials and Systems under eXtreme conditions
Tohoku University, Université de Lyon
www.elyt-lab.com/

VIETNAM

>MICA - Information Sciences (INS2I)
Multimedia Information Communication and Applications
Grenoble-INP, HUST
www.mica.edu.vn

>CINTRA - Engineering & Systems (INSIS)
CNRS International Thales NTU Research
Alliance NTU, Thales
www.cintra.ntu.edu.sg

>BMC² - Biological Sciences (INSB)
BioMechanisms of Cellular Contacts
NUS
<https://www.viasnofflab.com/>

■ International Joint Research Unit (UMI) ■ Joint Research Unit with MEAE (UMIFRE) ■ Consortium



cefc

© CEFC / Conference: Twenty Years After: Hong Kong's Changes and Future under China's Rule

UMIFRE CEFC The French Centre for Research on Contemporary China

FAST FACTS

Date of creation : 1991
Director : Eric Florence / eflorence@cefc.com.hk
Partners : CNRS and French Ministry for Europe and Foreign Affairs, Academic institutions including HKU
People : 7 researchers and 16 associated scholars
Number of PhD : 2
 1 PhD CNRS International mobility scheme
 1 PhD CEFC scholarship
Website : www.cefc.com.hk

At a glance

The French Centre for Research on Contemporary China (CEFC) is a public research centre supported by the French Ministry of Foreign Affairs and the National Centre for Scientific Research (CNRS). Its mission is to study various aspects on political, economic, social, and cultural developments in Contemporary China. First established in 1991, the Centre is based in Hong Kong, with an office in Taipei since 1994 and in Beijing since 2014. Currently, our Centre is accommodating ten researchers working on independent projects during their sojourn in our centre which typically last from two to four years. CEFC Hong Kong : <http://www.cefc.com.hk/>
 CEFC Taipei : <http://www.cefc.com.hk/centre/taipei/>
 CFC Beijing : <http://beijing-cfc.org/?lang=zh>

Mission

With its main office located in Hong Kong, the CEFC has two additional branches located in Tsinghua University (Beijing) and Academia Sinica in Taipei. The Centre offers a dynamic platform for French and European researchers to collaborate with social science professionals from Hong Kong, mainland China and Taiwan-based scientific institutions. Since its establishment in Hong Kong, the Centre welcomed a number of international experts and has subsidized over 30 PhD students who carried out their field studies in Greater China. We also offer a network for past CEFC research to ensure continuous communications in enhancing future research work in all aspects of social science.

Scientific research at the CEFC

Since 1991, CEFC has closed collaboration with different universities, institutes and research institutions from worldwide. Seminars and conferences were organized with support from local, mainland and French universities. Being the unique European research centre fully devoted to contemporary China, the Centre also plays an essential role in coordinating related research projects in Europe.

Check the profile of our researchers here :

<http://www.cefc.com.hk/research/researchers/cefc-researchers/>



Eric Florence

China Perspectives : a quarterly peer-reviewed academic journal

The CEFC publishes *China Perspectives*, a quarterly peer-reviewed academic journal in French since 1992 and its identical version in English since 1995. The journal is devoted to the study of contemporary China. Each issue presents a special feature, guest edited by an internationally recognized specialist. *China Perspectives* welcomes submissions of individual papers or special issues on any topic related to contemporary China. Manuscripts can be submitted in French or English and are blindly reviewed by 2 anonymous external referees before being accepted by the editorial board.

China Perspectives is available on most of the major academic resources platforms, such as EBSCO, ProQuest, JStor, Revues.org. The journal is indexed in 8 international databases, including SCOPUS, RMIT, and ranked by the French Council for the Evaluation of Research (HCERES) in Political Science, Sociology/demography and Anthropology. *China Perspectives* has been accepted for coverage in the "Emerging Sources Citation Index" (ESCI). The journal's impact and international visibility have been on the rise for the last few years. For instance, *China Perspectives'* SJR index has improved from 0,103 to 0,241 from 2013 to 2015.



Crédits : CEFC

Interview

Eric Florence, Director



How would you describe the CEFC ?

The CEFC is first of all a dynamic pool of French and European scholars studying the major social, economic, political and cultural processes impacting greater contemporary China - Hong Kong, Macau and Taiwan - in the various disciplines of the human and social sciences. Subjects as different as Internet governance, health systems, collective action related to labour and environment protection, workers' identity building, conflicts in the South China Sea, regional trade policies, etc. are being studied and documented at the CEFC. Researchers usually are CEFC residents for 2 to 4 years maximum.

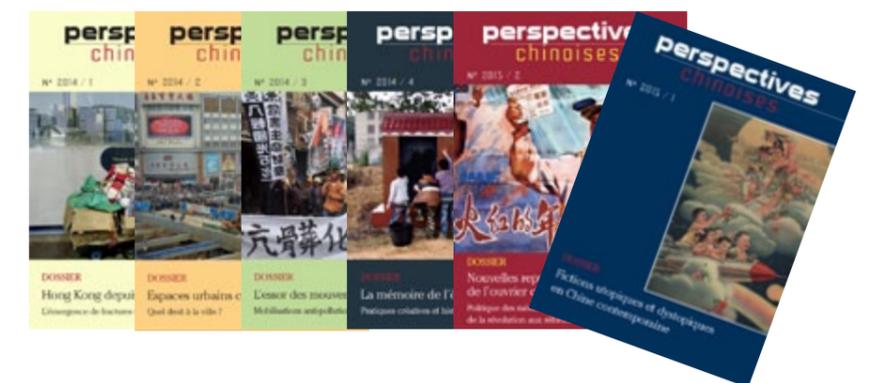
As CEFC Director, I both support the researchers developing investigations "to the field", especially those carrying out ethnographic fieldworks, and the other scientists gathering first-hand qualitative or quantitative data. As you know CEFC is headquartered in Hong Kong but has two other branches, one in Taipei (Academia Sinica) and the other one Beijing (Tsinghua University). This is definitely a competitive advantage in terms of research to develop our activities from three sites. Additionally, this proximity to their areas of investigation enables CEFC researchers to develop critical collaborative networks with colleagues in the region. Secondly, the CEFC is a magnet which attracts outstanding scientific knowledge on contemporary China through its publishing of a cutting-edge quarterly peer-reviewed journal dedicated to the study of contemporary China. The team of CEFC researchers, constituting the editorial board of the journal, collectively run *China Perspectives/Perspectives chinoises* with each issue published in both English and French. Submissions of articles and full special features coming from scholars based all around the world converge to the CEFC, through its journal. Thirdly, the CEFC is a wonderful platform to fuel the scientific debate within the academia and to disseminate knowledge to the society at large through its many events such as seminars, roundtables, international workshops, conferences and collaborative research projects. Eventually, it provides an excellent scientific and human environment for PhD candidates and post-docs.

What are the challenges for the CEFC?

Research centres such as CEFC are indeed facing many challenges. Let me single out a couple of them. Clearly, my first team's challenge is to elaborate a sound balance between the time needed for scientific research and the time dedicated to dissemination and outreach. Making the scientific knowledge production at the centre through its diverse and frequent activities, targeting various publics and organized in close collaboration with local scientific institutions or civil society is a critical dimension of CEFC activities. But the first one - i.e. sufficient continued time for research, including fieldwork - is crucial as well. Without this valuable time, one cannot talk of the excellence of the research produced within our network of research centres since this is the sine qua non condition which makes that our research is valued by our foreign colleagues and by the general public. A second major challenge, which all UMIFRE face increasingly, is the capacity to attract external funding through the submission of research projects with scientific partners. In this respect, the rather short length of time which researchers spent at the centre introduces significant constraints in building integrated projects and successfully raising funds.

CEFC is said to be a success story in terms of knowledge production regarding contemporary China, what does this concretely mean?

The increasing outreach and legitimacy of *China Perspectives/Perspectives chinoises* over the years as a peer-reviewed journal is critical in the reputation of the centre. For a few years, its editing process has turned excellence oriented and the quality has substantially increased. We can see that this is being rewarded by the outstanding submissions proposals we receive every month. Another truly crucial point is the excellent local and regional institutional integration of the CEFC and its two branches. The collaboration with local scientific partners is manifold and as soon as large scale events are set up, we always collaborate with local partners both at the scientific level, and at the level of funding.





© UMI E2P2L

UMI E2P2L Eco-Efficient Products and Processes Laboratory

FAST FACTS

Date of creation : January 2011

Director (Solvay) : Armin Liebens / armin.liebens@solvay.com

Deputy Director (CNRS) : Marc Pera-Titus / marc.pera-titus-ext@solvay.com

Partners : Academic partners : CNRS (FR), ENS Lyon (FR), Université de Lille (FR, mirror), ECNU (CN), Fudan University (CN)

Industrial partners : Solvay (FR, BE)

Main collaborations :

CNRS/IC2MP (FR, mirror), ECUST (CN)

People : Solvay Staff (Sept 2016) : 11

CNRS staff (Sept 2016) : 2

Postdocs (Sept 2016) : 3

PhDs (Sept 2016) : 9

Website : www.e2p2l.com

Context

The international joint unit, Eco-Efficient Products and Process Laboratory, E2P2L (UMI 3464 CNRS/Solvay), is an international research entity dedicated to renewable and sustainable chemistry. It is based in Shanghai and strives to develop innovative eco-efficient products and environmental benign processes capable of reducing our dependence on oil and fossil resources.

Undeniable climate change and mitigation of fossil resources calls for unprecedented mobilization of our societies, with scientific research efforts being one key element to deliver the expected solutions. This is particularly true for the chemical industry that is now fully embarked into a strategy of continuous improvement of its impact on the environment. This can be in practice achieved not only by reducing the carbon footprint of the processes, but also by designing new eco-efficient products and synthetic routes affording a better utilization of renewable resources.

Research strategy

The research strategy, both academic and applied, focuses on advanced chemo-catalysis applied to the production and application of specialty chemicals, while not excluding breakthrough solutions for the synthesis of commodities. Examples of specialty chemicals encompass bio-based surfactants, bio-based monomers, polymers building blocks, green solvents or additives. The use of sustainable feedstocks such as biomass or carbon dioxide is favored.



Armin LIEBENS



Marc Perra-Titus

The complexity of the scientific challenges to develop eco-efficient products and processes imposes necessarily the combination of a large variety of skills. We believe that only by developing a multidisciplinary and transversal teamwork approach combining fundamental research and technological developments we can overcome the main barriers against innovation. Accordingly, since its birth, E2P2L was positioned as an open innovation collaborative laboratory addressing cutting-edge academic breakthrough concepts in the field of Sustainable Chemistry for the design of eco-efficient processes and sustainable products. The location of E2P2L at Solvay's R&I center in Shanghai aimed not only at favoring the interaction with the different local teams and GBUs, but also at promoting its academic visibility. In this view, E2P2L was designed to boost international collaborations, mainly between leading Chinese and European academic laboratories, including the promotion of Sino-French relations and industrial-academic partnerships.

Outcome

Although it is still in its infancy, E2P2L has already become an academic actor in the fields of Catalysis and Sustainable Chemistry both in China and Europe, as well as a reference Catalysis center in the R&D strategy of Solvay. The remarkable scientific production of the team (50 publications published in the period 2012-2016) and number of patents filed (more than 40 patents filed in the period 2011-2016, 20 in collaboration with CNRS or other academic institutions) illustrate the dynamism of the unit. The laboratory passed with success the HCERES evaluation in September 2015.



Building Ginkgo, Research & Innovation Center, Shanghai, China

Interview

Armin LIEBENS, Director



In a few words, how can you describe E2P2L ?

The Eco-Efficient Products and Processes Laboratory, E2P2L, is an international joint research entity dedicated to Catalysis and Sustainable Chemistry. The laboratory is based in China, Shanghai. It is operated by a highly educated, competitive and international team of scientists and researchers from seven countries (mostly China).

We strive to develop innovative eco-efficient products and processes and to deliver innovations based on high-level scientific discoveries. Indeed, the complexity of the scientific challenges to develop eco-efficient solutions imposes necessarily the combination of a large variety of skills. We believe that only by developing a multidisciplinary and transversal teamwork approach combining fundamental research and technological developments we can overcome the main barriers against innovation. Accordingly, since its birth, E2P2L has been positioned as an open innovation collaborative laboratory addressing cutting-edge academic breakthrough concepts in the field of Green Chemistry for the design of eco-efficient processes and sustainable products.

The location of E2P2L at the Research and Innovation Center Shanghai (RICS) of Solvay aimed not only at favoring the interaction between the different local teams and Global Business Units of the Group, but also at promoting its academic visibility. In this view, E2P2L was designed to boost international collaborations, mainly between leading Chinese and European academic laboratories, including the promotion of Sino-French relations and industrial-academic partnerships.

Although it is still in its infancy, E2P2L has already become a significant academic actor in the fields of Catalysis and Green Chemistry both in China and Europe, as well as a reference Catalysis center in the R&I strategy of Solvay. The remarkable scientific production of the team (more than 50 publications published in the period 2012-2016) and number of patents filed (about 40 patents filed in the period 2011-2016, 20 in collaboration with CNRS or other academic institutions) illustrate the dynamism of the unit.

What are the major challenges of E2P2L ?

The first and non-negotiable priority for all E2P2L members is safety, in particular to keep a zero-medical treatment accident rate. Besides, the main challenge of E2P2L is in my opinion how to manage well the complexity of the laboratory and the expectations from the different partners, particularly in terms of time horizons. However, such complexity can be turned into an advantage in terms of complementarity.

Interfaces can be found across regions and countries (mainly Asia/China and Europe/France), academia and industry, but also on a more technical level between Chemistry and Process Engineering. Good and open communication remains key here! A further challenge consists of student related VISA issues. Today the laboratory can hosts almost exclusively PhD and master students with Chinese nationality.

E2P2L is said to be a success story for both CNRS and Solvay together with their Chinese partners (ECNU & Fudan), but what does it concretely mean ?

E2P2L is built on a win-win partnership model. Each partner has a voice in a steering committee and participates in the selection and execution of projects, which match ideally the required competencies. Projects are reviewed in regular meetings and challenged by a selected scientific and steering committee.



E2P2L Team Picture 2014

What about E2P2L in five years-time ?

Given the present team of highly motivated and talented scientists, we believe that E2P2L can become an actor in the fields of Catalysis and Sustainable Chemistry in the international scene. This should provide a sound basis to extend E2P2L existence well beyond the horizon 2020. We expect to keep the quality and number of scientific publications and patents on a high level and delivering tangible results and innovations to the Solvay group.



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UMIFRE CSH Centre for Social Science and Humanities

FAST FACTS

Date of creation : 1990

Director : Nicolas Gravel / nicolas.gravel@csd-delhi.com

Staff member : 21

Partners : CNRS and French Ministry for Europe and Foreign Affairs

Cities involved : Paris, New Delhi

Website : <http://www.csh-delhi.com>

At a glance

The Centre de Sciences Humaines (CSH) is a research unit jointly managed by the French Ministry of Foreign Affairs and the French Centre National de la Recherche Scientifique (CNRS). Located at the Cultural Section of the French Embassy in New Delhi, it is part of the network of twentyseven research centres that France is managing all over the world.

The scholars and doctoral students who work at CSH comes from France and India. They all conduct scientifically ambitious research in all disciplines of the social sciences and humanities (anthropology, demography, economics, geography, law, political sciences and sociology). This research often for Indian and South adopts a pluri-disciplinary perspective and deals with issues that are of importance in Asia.

Missions and research topics

Like many other French research centres located outside France, CSH provides logistic facilities to non-CSH researchers coming to India and the Indian subcontinent. But there are also permanent researchers based at CSH on a longer period who conduct research of their own that targets the best possible publication outlets. In recent years, research conducted at CSH dealt with issues as diverse as migrations, inequalities and poverty, law and civil rights, gender and women political participation, urban issues, public health, and agricultural economics.



Book Launch: 'Urban in equality rising far more in India' François Bourguignon



Nicolas Gravel



Leila Choukroune

Main research projects

CSH researchers are involved in many externally funded research projects. One of them, funded by Oxfam India, deals with the village of Palanpur in which an extensive data set has been collected over the last forty years, in collaboration with the London School of Economics. Another project, funded by Agropolis Montpellier, deals with the milk production sector in India (who is the world largest milk producer). This research project examines the development and environmental sustainability of this sector in the context of the radical transformation of the country's aggregate production structure.

The institutions and laboratories involved

French side : CNRS, Ministry of Foreign Affairs, Ecole des Hautes Etudes en Sciences Sociales (EHESS)

Indian side : Indian Statistical Institute, Delhi, Jawaharlal Nehru University, department of Economics, Center for Policy Research



Conference ENGIND, Jan 2016

“ A fast-growing Indian economy is attracting attention for both good and bad reasons. CSH has allowed engaging with the Indian community at a deeper level and on an equality footing. ”

Interview

Leila Choukroune, Former Director



Initially focused on tracing the history of Indo-Persian cultural history, the Centre for Social Sciences and Humanities has gone through certain interesting twists and turns over the years. How do you assess the evolution of the Centre and its present state?

In the early 1980s, a research Centre located in Kabul was working on archaeology and as the team of scientists moved to India the research turned towards Indo-Persian history, with a more anthropological approach first, and then on contemporary studies on South-Asia. Our focus is not only north India but the whole region from Kabul to Calcutta, Karachi to Mauritius. We cover the South Asia and importantly social sciences extending from Political Sciences, Economics, Geography, Law, History to Anthropology. At CSH, we have scientists from France, other European countries, India and the region, making it dynamic because of the interaction of the people from various disciplines. We study four research areas, Risks and Territorial Dynamics; Politics and Society; Economics and Development and Globalisation and Regulation.

You have displayed a good example of integrating with the regional or local academic and intellectual community and also with the Alliance Française. How did you succeed in identifying your scientific and academic partners?

We have 30 years of experience and have built a vast network, particularly in Delhi, with for example, Delhi University, JNU, South Asian University, Jindal Global Law School, National Law Schools, Indian Institute of Foreign Trade, Centre for Policy Research (CPR) etc.

With the Alliance Française de Delhi, we have a privileged partnership, thanks to Jean-François Ramont. We have launched a visual evening series of documentaries screenings followed by academic discussions. This has worked well and has been useful in publicizing our work to a larger audience than traditional discussions and debates.

We also have interesting partnerships with Editors as with Springer for example. We have recently published several series with Springer including "International Law and the Global South" that I have created and the "CSH-Springer series".

What do you think, are difficulties, if there are any, in working with India or Indian scientific community?

Personally, I find that it is easy to work with Indian colleagues, especially in social sciences wherein I have a direct experience working with Indian colleagues. It is a large community, always dynamic and enthusiastic. They have political mindsets in the sense that they can easily reach out to civil society, government and other organizations. Earlier I was based in China where it was different because of politics, hierarchies and the lack of real academic freedom. India being a democracy with still many counter powers, it is easy to work if one is genuinely interested in engaging with the community at a deeper level that is on the long run and on an equality footing. What I find more difficult has nothing to do with India: it is about funding, as social sciences are not well funded. Indeed, all over the world, it becomes more and more difficult to fund social science research. Social sciences are seen as little bit tricky, somewhat politically dangerous and not necessarily impacting society, which I think, is not true.



Centre for Social Science and Humanities, Delhi, India

Economics and development seem to have drawn more attention in the recent Indian context: what has led to this increased focus on Indian economic emergence compared to either the other Asian countries or for that matter, France?

Indian economy is indeed drawing a significant attention, not only because it is fast growing but also because it is not bringing the results it should bring. India still has the vast majority of poor people of the world. It is a very unequal society, unable to redistribute the benefits of growth. Thus, economy is attracting attention for good and bad reasons.

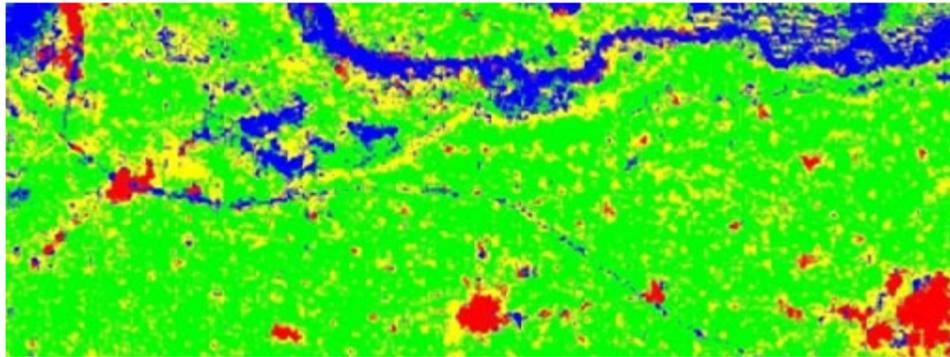
In this respect, I find that the sort of lens used to analyze India is often either outdated or overspecialized. I would like to see more researchers able to approach and encompass the whole India through an open mind: researchers ready to engage with other disciplines, to read and write on other disciplines and not only on their very specialized field.

How do you consider India's position in terms of challenges in regulation related to the inevitable globalization and its ramifications?

India is seen as obstructionist yet not engaging enough. India has very good lawyers and specialists, yet they do not always know where they are or where to stand. For them as well, it is bit complicated to move on from the sort of caricature developing country to something different, to a world leader able to protect its poorest population, yet also able to propose a plan for the world at large.



Motor Scrap Shop, Mayapuri, Delhi, India © Rémi de Bercegovt



Inference of physical features using low resolution satellite data. Ganga canal is visible only after enhancement using dual frequency transform technique.



UMI IFCAM

Indo-French Center for Applied Mathematics

FAST FACTS

Date of creation : 2012

Director : Govindan Rangarajan / govindan.rangarajan@gmail.com

Deputy Director : Fabrice Gamboa

Number of PhDs : 29

Partners : Department of Science and Technology (Government of India), Indian Institute of Science, CNRS.

Site internet : <http://math.iisc.ac.in/~ifcam>



Govindan Rangarajan



Fabrice Gamboa

At a glance



Department of Mathematics, Indian Institute of Science, Bangalore, India

The Indo-French Centre for Applied Mathematics (IFCAM) has been jointly set up by the Indian and French Governments at the Indian Institute of Science, Bangalore as an international joint research unit. IFCAM is designed as a platform for cooperation in mathematical sciences with the primary focus being the area of applied mathematics. IFCAM funds joint research projects between Indian and French investigators, exchange visits of faculty and students (within the ambit of a research collaboration), exploratory visits, post-doctoral fellowships, joint research workshops, annual summer/winter school, and visits by Indian researchers (particularly from universities and colleges) to IFCAM.

Missions and research topics

The mission of the Indo-French Centre for Applied Mathematics is to build, based on the existing fruitful bi-lateral collaborations, a centre internationally recognized in focused areas of applied mathematics.

Main research projects

The main research areas are analysis, numerics, qualitative properties, optimization and control of models coming from Physics, Biology, Ecology. They also include Data Assimilation, Image processing, Modeling and optimization of networks, Statistics, Scientific Computing.

The institutions and laboratories involved

French side : CNRS, Ecole Normale Supérieure de Paris, Ecole Polytechnique, Institut national de recherche en informatique et en automatique, Université Nice-Sophia Antipolis, Université Paul Sabatier Toulouse III.
Indianside : Indian Institute of Science.



Workshop on control and numerics for Fluid-Structure Interaction Problems, Bangalore

“Mathematicians can also address real world problems while being in academics. IFCAM greatly strengthened Indo-French cooperation in applied mathematics.”

Interview

Govindan Rangarajan, Director



India and France share a profound fascination for Mathematics. André Weil, Father Racine followed by several other French mathematicians have interacted with India right from the 30s. However, a structured entity, the prestigious International Mixed Unit (UMI), the Indo-French Centre for Applied Mathematics came into existence in 2012. Could you relate the progression of early events that ultimately culminated in the creation of IFCAM?

Cooperation in Mathematics between France and India goes back to more than half a century ago and has from the beginning been very active. French leaders in pure as well as in applied Mathematics have significantly contributed to foster these ties by their visits and stays in India. André Weil, Laurent Schwartz, Jacques-Louis Lions, Henri Cartan, have recognized in the fifties and early sixties the deep mathematical culture of Mathematicians throughout India, the high level of students in this discipline, and they have encouraged the development of exchanges, thus setting up firm ground for long standing cooperation.

In 1987, the creation of CEFIPRA/IFPCAR and, further on, the setting up of specific programs of cooperation in Mathematics have permitted structuring these exchanges. In 2004, the program IFIM (Indo French Institute of Mathematics) was created under the umbrella of the intergovernmental Agreement POC (Program of Cooperation) between France and India. This virtual structure was funded by CNRS on one side and DST on the other side. It was successful in sustaining exchanges mostly in the field of “pure” mathematics, not so much in the vast area of “applied mathematics”.

Another initiative named FICUS (France India Cyber University in Science) was taken between the Indian Institute of Science Bangalore and the University of Toulouse in 2000. The infrastructure for e-teaching was set up in both institutions with the help of the national space agencies of both countries and courses started in 2002, essentially in applied and industrial Mathematics.

These activities ultimately led to the creation of IFCAM.

How has this CNRS initiative helped to strengthen the Indo-French interactions in general, and how has the mathematics community in particular benefitted from this Centre?

The CNRS initiative has led to a sustained flow of faculty members and students between India and France in the broad area of applied mathematics. The research workshops and summer schools have helped train a large number of Indian students. All these initiatives have led to the further strengthening of interactions between Indian and French mathematicians.

How do the Indian mathematicians align with their French counterparts? Are there major differences in the working philosophy and the methods in approaching the problems?

A major difference could be in the attitude of applied mathematicians towards collaborations with industry partners. French mathematicians seem to be more welcoming of such interactions than Indian mathematicians. Otherwise the working philosophy appear to be similar.

IFCAM covers a large diversity of applied aspects of mathematics ranging from game theory all the way up to modeling the activity of gravid uterus and cancer immunotherapy. How do you initiate the dialogue, the complementarity and interdisciplinary of these projects in multiple domains?

Most of the projects evolve from open calls. Some were initiated by workshops that brought together potential Indian and French partners.

Some of the contemporary mathematicians argue that the quality of mathematics teaching in India is going through a crisis; do you think structures like IFCAM help in improving the standards of mathematics education and how can we further strengthen such structures?

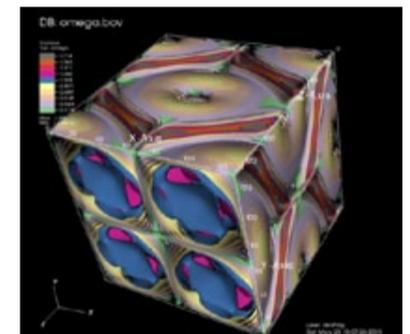
The summer schools conducted by IFCAM have helped train many Indian students (both from mathematics and engineering) in modern areas of applied mathematics.

Do you think the young mathematicians seeking lucrative positions in industry are going to create a void in the knowledge pool due to lack of motivation for research and do you think more initiatives such as IFCAM would overcome this?

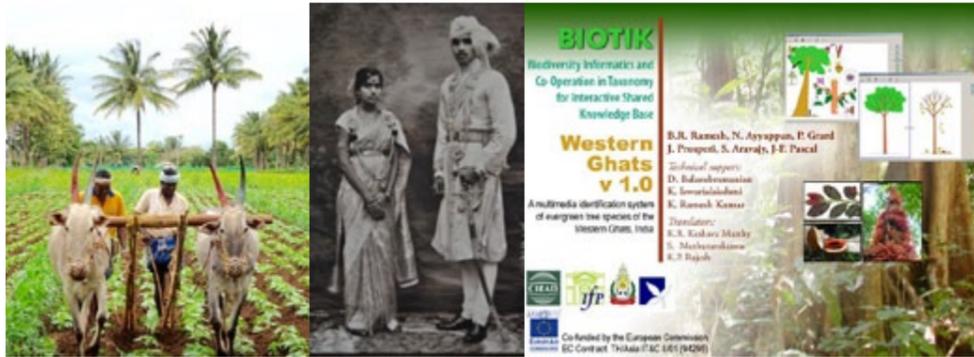
Given the availability of a large number of academic position in India, very few mathematics students opt for a career in the industry. The problem arises because few good students opt for mathematics in the first place given the attraction of engineering and medicine that can lead to lucrative careers. IFCAM, by showcasing the modern applications of mathematics, can help correct the perception that mathematicians can carry out research in real world problems while being in academics.

At the closure of the first five years of IFCAM, what are the highlights of IFCAM?

We greatly strengthened cooperation between Indian and French applied mathematicians, that involved 93 faculty members, 29 PhD students and 12 post-docs. Work carried out under IFCAM resulted in 53 journal papers and 38 conference proceedings and a total of 138 visits were carried out between India and France.



Isosurfaces of the magnitude of the vorticity at 10 different levels. These are obtained by solving the Euler equation, via the Cauchy-Lagrange method, with the two-dimensional Taylor-Green initial flow.



UMIFRE IFP French Institute of Pondicherry

FAST FACTS

Date of creation : 1955
Director : Frédéric Landy / frederic.landy@ifpindia.org
Staff member : 80
Number of PhDs : 8
Partners : CNRS and French Ministry for Europe and Foreign Affairs
Cities involved : Pondichéry (+ Bangalore, Kolkata)
Site internet : www.ifpindia.org

At a glance

The Institut Français de Pondichéry (IFP), UMIFRE 21 CNRS-MAEE, is a research centre under the joint supervision of the French Ministry of Foreign Affairs and the French National Centre for Scientific Research (CNRS). It is an integral part of the network of 27 research centres connected to this Ministry. It is also part of the research unit 3330 "Savoirs et Mondes Indiens" of the CNRS, along with the Centre de Sciences Humaines (CSH) in New Delhi.

Missions and research topics

The Indo-French Treaty of 1956 defines the role of the IFP as being that of an establishment of research, expertise and higher education. It also imparts training to internship students and to doctoral and post-doctoral students from France and other countries.



French Institute of Pondicherry, Pondicherry, India



Frédéric Landy

The IFP's scientific out reach is international, although it remains primarily focused on research in India and on India. The IFP contributes to the understanding and to the conservation of cultural heritage (languages, religions, architecture, medicine, etc.) and natural heritage (environment, forests, etc.) while taking into consideration the powerful socio-economic dynamics that impact this emerging country.

Main research projects

The research projects conducted in each Department of the IFP come into either one of the following axes:

Indology : • Indian analyses of Sanskrit language and literature • History of religions • Tamil studies • Archaeological heritage of South India

Ecology : • Palaeoecology and palynology • Forestry and botany • Management and conservation of ecosystems and landscapes • Mathematics and informatics applied to Ecology

Social Sciences : • Health, Medicine and Societies • Urban and Environmental Dynamics and Policies • Economy, Finance, Debt, Labour and Mobility • Legal Anthropology and Social Structures

Geomatics : • LiDAR modelling • Carbon stock assessment • Remotesensing of forests • Natural risks in coastalregions and Management of water

The institutions and laboratories involved

French side : CNRS, CIRAD, EFEO, IRD, EHESS, EPHE, INALCO, General Council of the Reunion Island, Observatoire des sciences et des techniques, ISSC... The IFP has non-institutionalized partnerships with various other universities.

Indianside : CEFIPRA, Pondicherry University, Central Institute of Classical Tamil Chennai, Shree Somnath Sanskrit University, Rashtriya Sanskrit Vidya-peetha Tirupati, Sri Chandra Sekharendra Saraswathi Viswa Mahavidyalaya Kanchipuram, Sri Rangam Srimath Andavan Asramam, Karnataka Forest Department, Sharma Centre for Heritage Education



“ Environment and Heritage are the two major components of UMIFRE at French Institute of Pondicherry. ”

Interview

Frédéric Landy, Director



While inaugurating the 'Institut Français de Pondichéry', the first Prime minister of India, Jawaharlal Nehru desired that Pondicherry would be the 'open window to France'. How do you see the contribution of IFP and the UMIFRE over the years in bridging France and India?

The IFP was officially recognized by the 1956 Treaty of Cession of French "settlements" to the Indian Union. Scientifically, the IFP has three missions: research, higher education and expertise. We are consultants for Indian organisations, train Indian and French students, conduct research on India and we act as an interface between the two countries thus establishing multiple bridges. Interestingly, as for research, the Indian public and organisations recognize both the utility and legitimacy of the French Institute, since an original component of our tasks is to help maintaining, cataloguing, preserving, researching the cultural and natural heritage of India. Of course, all this is not fully known by the Indian public, not even in Pondicherry itself, but we have a very good reputation and the visitors are deeply impressed by the quality and the diversity of our research.



Training session in the Western Ghats for forest officials



Documenting Endangered Murals in Tirumalai

What are the missions of IFP now, and how have its research interests been relevant to today's South Asia?

In addition to training of students (master and PhD), hosting post-doctorates and expertising and consultation, our research is conducted in our four departments, Indology, Ecology, Social Sciences, and Geomatics (LIAG). In Indology, we focus on the key features of classical India, namely, its religions, its literature, its languages (mostly Sanskrit and Tamil). In Ecology, we concentrate on biodiversity and notably on the functioning of fragile ecosystems (forests, mangroves, etc.). The research in this department is crucial for South Asia given two major threats on the natural environment, locally (urbanization, population growth, etc.) and globally (e.g. climate change). The Laboratory of Geomatics (LIAG) has a component dedicated to research on Indian coasts and forests, mostly in relation with the department of Ecology. It is conducting pioneering work in modelling trees and forests by recent technologies (Lidar), or by using satellite imagery. The Department of Social Sciences promotes research on major social issues and on the relations between human societies and their environment: social management of water, urban development, demography and social mobility, migrations, finance and debt, impact of industrialization on rural systems, diffusion of new technologies, traditional health care systems, spread of transmittable diseases, etc. To conclude, two key words characterize our research: "environment" and "heritage".

How do you assess the academic, scientific and organizational interaction of the UMIFRE with the Indian counterparts?

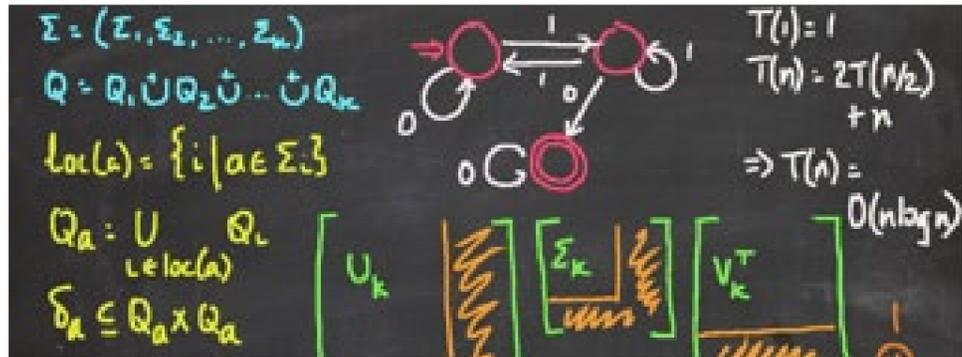
It is good. Comparatively, we need to intensify our interactions with institutions in France, which are paradoxically not so strong. As our research involves extensive fieldwork, we often need permission to get access to temples, forests, documents under study. Since most of our staff is Indian, since many Indian research centres and universities have a good academic level, we have a dense network of links with Indian institutions. Many Indian institutions are funding our research projects (Sanskrit universities, Department of Sciences and Technologies, etc.), and also private sponsorship. Some Indian and French researchers of the IFP supervise or co-supervise Indian PhD students.

Do you think that the French public in general and French scientific community in particular are aware of the documentary heritage and the knowledge treasure that the IFP represents and do you think they are extracting the maximum benefit from your institution?

Not at all! UMIFREs as such are too often ignored by the French scientific community, not to speak of the French public. Yet, they are unique tools (only France has such a network) for working as an entry gate and an interface between France and the host country.

Do you consider that the evolution of IFP has been healthy and how do you think we can further strengthen the Indo-French relations through IFP?

Scientifically, the evolution of IFP is relatively healthy since research production is good and often even very good. But financially it is quite alarming. The IFP cannot any longer reduce its staff and rely only on short term research projects. It has collections as well as a heritage building to maintain. The forest plot must be visited every year, with outside funding or without. Private sponsorship has to be more wooed, but it has its limits. In my opinion, the subsidy provided by the ministry of Foreign Affairs and CNRS is a very good investment in terms of research produced and scientific diplomacy per euro spent. CNRS should definitely increase its support to IFP (by more funds rather than by one more research position, if I have to choose). Lastly, CEFIPRA should be more open to social sciences.



© UMI RELAX / Mathematical objects

UMI RELAX

Indo French Research Lab in Computer Science

FAST FACTS

Date of creation : 2017

Director : Madhavan Mukund / madhavan@cmi.ac.in

Deputy Director : Dr Pascal Weil / pascal.weil@u-bordeaux.fr

Partners : Chennai Mathematical Institute, Institute of Mathematical Sciences, CNRS

Site internet : <http://projects.lsv.ens-cachan.fr/relax/>

At a glance

The Indo-French Research Lab in Computer Science (ReLaX) is the culmination of over 15 years of fruitful interactions between research groups from the two countries in foundational areas of computer science. Beginning with CEFIPRA projects around 2000, and progressing through P2R and other broader collaborations, the Indo-French Formal Methods Lab (INFORMEL) was set up as an LIA in January 2012.

In the five years 2012-2016, INFORMEL supported a number of exchange visits in both directions, generated about 60 joint publications, nurtured a number of jointly supervised PhD students and supported a few post-doctoral researchers. In addition, the LIA also provided a framework for researchers to apply for CEFIPRA projects on themes related to formal methods.

The goal of ReLaX is to expand this collaboration to researchers in other areas of computer science and related topics in mathematics in the participating institutions, and to also reach out to industrial partners.



Madhavan Mukund



Pascal Weil

Missions and research topics

The main research themes are foundational aspects of computer science, including formal methods and verification, models of computation, algorithms and complexity. In addition, ReLaX also hopes to reach out to related areas in mathematics, such as combinatorics, graph theory and number theory.

Main research projects

- Verification of hierarchical and distributed systems, quantitative and real-time
- Systems, infinite-state systems
- Security of protocols
- Automata over words, trees and graphs
- Computational complexity
- Developing efficient algorithms
- Approximation and randomized algorithms
- Distributed algorithms

The institutions and laboratories involved

French side : CNRS, Université de Bordeaux, École Normale Supérieure Paris-Saclay.
Indian side : Chennai Mathematical Institute, Institute of Mathematical Sciences.



ACTS workshop, CMI, Jan-Feb 2017

“ UMI-RELAX has an important role in accelerating the growth of computing research in India and creating a bigger impact at an international level. ”

Interview

Madhavan Mukund, Director



India's strength in mathematics and computer science is well known and is duly recognized by the French counterparts. You have established a productive Indo-French collaboration as attested by over 60 publications and a number of exchange visits. Can you trace the origin and the factors responsible for this durable bond with French counterparts?

Until the early 1980s, computer science research in India was limited to few institutions, notably TIFR and IIT Kanpur. Though there was already some collaboration with France at the time, substantial Indo-French collaboration in computer science started with the formation of IFCPAR/CEFIPRA in the late 1980s.

A workshop organized by CEFIPRA in 1989, brought together computer scientists from both countries, leading to joint projects in the 1990s involving well established researchers such as Gerard Boudol, Gerard Berry, R K Shyamasundar and P S Thiagarajan. These allowed a natural progression to active collaborations in the decade that followed, in automata theory, logic and formal verification.

Starting with a CEFIPRA project in 2000, we advanced to a CNRS-MAE supported research network project on timed and distributed models for control and verification, followed by an ARCUS project funded by MAE and Ile-de-France from 2008. A series of workshops were held in CMI. Deeper links thus led to the formation of an LIA in 2012, which has since evolved into the present UMI.

How do you intend to take advantage of the UMI towards scientific enrichment in the fields of computer science and mathematics?

The UMI broadly embraces all aspect of theoretical computer science and mathematics. The main participating institutions from France and India have strong groups in both areas and, importantly, also a long history of collaboration. We hope that the UMI will provide a framework to further develop these links and foster greater interaction across subareas, leading to new and interesting scientific developments.

Do you consider that the establishment of UMI would provide you with an impetus to obtain funding from other international or national sources?

Yes, we definitely hope that the establishment of the UMI will help us bring in funds from other sources. Our French partners have already experienced some success on this front, such as support for co-tutelle PhD students.

Computer science is undergoing an exciting transition in the Asian context with highly competent players as in China, Japan and Singapore. How do you see the position of Indian computer science in general, and the role of UMI-RELAX in particular, amidst this competitive atmosphere?

India is perceived globally as an IT powerhouse and Indians are prominent contributors, internationally, to computing research. Unfortunately, it has taken time for computer science in India to mature as an academic discipline. However, the number of active research groups is increasing and there are many young and energetic faculty members driving research in new directions. International collaboration is much easier now thanks to the reducing cost of travel, in relative terms, and, of course, the ease of communication through the Internet. We believe that the UMI-RELAX has an important role to play in accelerating the growth of computing research in India and creating a bigger impact at an international level.

LIA INFORMEL and eventually, the UMI RELAX display a strong partnership with industrial players both in India and in France. What is the nature of this partnership and how has this public-private partnership been mutually beneficial?

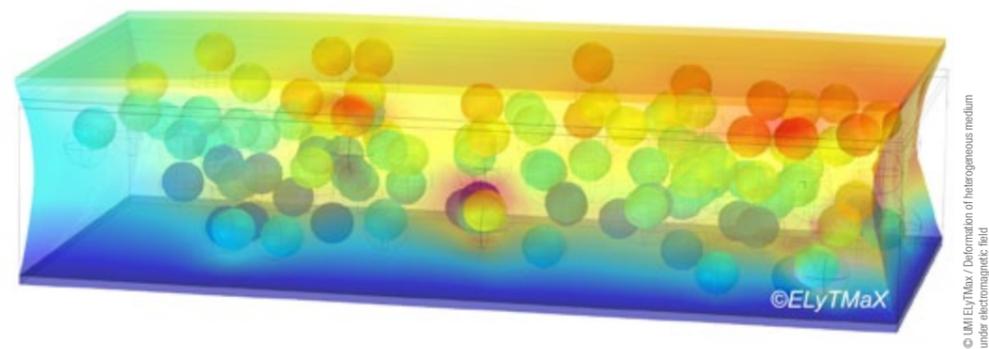
One of the main research themes of the LIA is automata theory and logic, whose main application area is the verification of computing systems. This has always been of interest in the design of safety critical systems – areas such as avionics and the nuclear industry. Today, software controlled devices are ubiquitous, including many sub-systems of automobiles and medical implants. In India, we have started collaborations with TCS Research and Honeywell to develop and incorporate formal methods for verification into their software design process. These partnerships are mutually beneficial as they also suggest new directions for academic research.

Pursuing your reflections on your public-private partnerships, what is the equation of UMI-RELAX with the ever-proliferating information technology industry in India?

The IT industry in India has traditionally been service-focused, with a limited need to interact with academic research groups in computer science. This is changing recently and there is growing interest in formal verification. Another very promising area is machine learning, given the proliferation of data and the desire across the board to use this effectively to provide new services and improve quality and efficiency.



Chennai Mathematical Institute, Kelambakam, India



© UMI ElyTMax / Deformation of heterogeneous medium under electromagnetic field

UMI ElyTMax Engineering Science Lyon – Tohoku for Materials and Systems under Extreme Conditions

FAST FACTS

Date of creation : January 1st, 2016
Director FR : Gaël Sebald / gael.sebald@cnrs.fr
Director JP : Kazuhiro Ogawa / kogawa@rift.mech.tohoku.ac.jp
Number of staff : 12 permanent staff (4 French + 8 Japanese)
Number PhD students : 4 double-degree (Université de Lyon / Tohoku University) ;
Number post-doc : 2 ; **Lab space :** 170 m²
Number co-publications : 5 from the creation, 16 international conferences (including 4 invited conferences).
Main events : Inauguration & Workshop 4 – 8 October 2016.
Cities involved : France, Lyon ; Japan, Sendai
Industrial partners : Discussions ongoing with three major industrial partners from France and Japan ;
Website : www.elyt-lab.com
Institutions and laboratories involved :
 French side (CNRS / Université de Lyon) : MATEIS, LGEF, LaMCoS, LTDS
 Japanese side (Tohoku University) : IFS, GSE, AIMR, IMR

At a glance

The collaborations and joint researches between Tohoku University and research teams from Lyon started more than 30 years ago, leading to the creation in 2004 of liaison offices at Tohoku University and Université de Lyon, along with numerous academic agreements facilitating the exchange of students and young researchers between the French and Japanese teams. Following the creation and the success of an international associated laboratory (LIA) in 2008, the links between the Université de Lyon, Tohoku University, and the CNRS were further strengthened in 2016 with the creation of the international joint unit UMI ElyTMax. Our laboratory is fully integrated into the dense cooperation network between Tohoku University, CNRS and Université de Lyon, and hopes to act as an intermediary between the newly-created Fédération Ingénierie Lyon Saint-Etienne (IngeLySE) and the engineering developed at Tohoku University. In addition to the UMI, it comprises a LIA ElyTGlobal having a broad scientific spectrum and an annual summer school ElyTSchool (created in 2009) intended to attract students into international curriculums.

Research topics

The research conducted at the ElyTMax laboratory (CNRS - Université de Lyon - Tohoku University) focuses on the behavior of materials—and the systems they form with other structures—under extreme and complex conditions (pressure, temperature, radiation, or highly corrosive environments).



Gaël SEBALD



Kazuhiro OGAWA

Two main areas of research in particular are being developed:

- **Analysis of the evolution of materials used in industry, for example in energy production or transportation.** The research is based on both experiments and modeling, within a context of extremely rapid deformation, aggressive medium, high temperatures, etc., in order to develop strategies for the conditioning, protection, and healing of surfaces used in industry. As an example, a strong activity is devoted to cold-spray technique for depositing different types of materials (metals, ceramics, and now polymers), thus developing innovative application fields for materials hardly processed otherwise, like ultra-high molecular weight polymers. More generally speaking, a bottom-up approach is applied to the analysis of physical-chemical mechanisms in real situations encountered in industries.

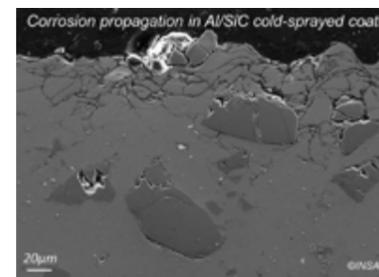
- **The study of microsystems used for the conversion of energy,** and their resistance to pressure and electric fields. Researchers study new materials and energy conversion systems, using both multi-scale (molecular, macroscopic, etc.) and thermodynamic approaches, in an effort to understand, for example, how the nano-architecture of materials is responsible for the macroscopic effects observed. The study and modeling of physical mechanisms makes it possible to simulate how the microsystems operate, and optimize them prior to their manufacturing. The goal is to design new numerical tools able to propose optimized systems based on structured materials, for given specifications.

A third activity related to ageing of materials used to biomedical applications should start in the next future, for example bone substitutes and prosthesis subjected to complex dynamic stress solicitations and physical-chemical environments.

Each of these research areas aims to elucidate the behavior of materials subjected to complex stress beginning with their production and implementation, in order to assess their life span. The projects under development rely in particular on the complementarity between French and Japanese researchers, which differs according to area of research. For example, researchers in Lyon have strong expertise in the electrochemical approach of the study of corrosion, while Tohoku University excels in the analysis of corrosion under extreme conditions. This cooperation thus makes it possible to envisage a complete approach of materials science, based on both the development of experimental techniques and the modeling of the physical and physical-chemical mechanisms in play.

Interview

Gaël SEBALD, Director



Sakura, Katahira, Tohoku University

ElyTMax is the most recent UMI in Japan but it actively interacts with a quite large number of researchers. How could you create such a large network so quickly?

From its origin, ElyTMax has been created upon a long established network of researchers. For more than 30 years, the French and Japanese scientific communities have recognized each other's international top level in the field of Mechanical Engineering, Tribology, Flow Dynamics and Materials Science... Gradually, academic institutions in Lyon (mainly ECL and INSA-Lyon) and Tohoku University have developed a whole range of scientific and academic collaboration, including an associated laboratory, ElyT-Lab, and multi-level bi-directional academic exchange featuring the ElyT Summer School and double-degree master and PhD programs. Thus, ElyTMax is "only" the latest and most integrated development of this collaboration with a permanent joint laboratory in Tohoku University supported by CNRS and Université de Lyon. This collaboration has been very dynamic and each part of it is enriching the others: for example ElyT Lab and ElyTMax have hosted up to now 16 co-tutored PhD students, including 7 presently. That is why we like to consider ourselves as the "ElyT Community". When our parent academic institutions celebrated their triple anniversaries (150 years for ECL, 100 for Tohoku University and 50 for INSA-Lyon) in 2007, our community organized its first workshop which brought together more than a hundred scientists. Since then, we go on regularly organizing symposiums which attracts a similarly large audience or even bigger: our ElyT Community is keeping well active!

In which way, operating an UMI represents a step further in the collaboration?

Working daily in an international environment breaks routine, and develops the researchers' creativity. The UMI environment is a true melting pot, and, combining both French and Japanese ideas, is favorable to the emergence of renewed creativity, through various and frequent scientific exchanges with excellent researchers from leading universities. It gives the researcher a wonderful opportunity to go deeper in his/her scientific questionings. In France, our labs are traditionally very open to blending of cultures (they are often mixed structures between research institutes and universities) and to international collaboration, but there is indeed a big step further in the intercultural exchanges while working in a UMI. For our partners also, notably our industrial partners, clearly the international nature of the UMI and its implementation in Japan is definitively an advantage, helping them to open their scientific research to international cooperation, and UMI makes them more confident for potential collaborations. Last but not least, the UMI expands the scope where its researchers apply for funding, as they can do it in Japan, in France as well as in Europe.

But working overseas also bears some difficulties, doesn't it?

Of course, at start, there is a culture gap and we have to pay attention to the language barriers, in both spoken and non-spoken communication, the latter one following codes that are quite unfamiliar at the beginning. Also, as we created a completely new structure, we faced numerous administrative issues which required a large involvement in every single of them to be solved. At the same time, we have received a huge support from all our parent institutions for all aspects – from practical to administrative issues. Eventually, everything turned out to work fine, even if some innovative solutions needed to be found. My best recommendation to my UMI fellow researchers is to always keep a positive attitude and also to be confident in the strong involvement of our partners and institutions to help their mobility. On a more personal side also, Sendai is a provincial capital where only few French have been living when ElyTMax was created, but thanks to the great support from Tohoku University and its staff, all the French members of the UMI were able to adapt quite rapidly and to invent their way of living here. And the difficulties soon became further richness.



ElyTMax in MaSC Building, Tohoku University



ElyTMax facilities



© Site internet umifre 19



Interview

Cécile SAKAI, Director



UMIFRE FRIJ French Research Institute on Japan (UMIFRE 19)

FAST FACTS

Date of creation : 1924 (• 1924 Institute • 2007 UMIFRE)

Directress / Director : Cécile Sakai / c.sakai@mfi.gr.jp

Contact : Maison Franco-Japonaise Bureau français 3-9-25, Ebisu, Shibuya-ku, Tokyo, 150-0013 Japan / 0081-3-5421-7641

Partnerships : CNRS and French Ministry for Europe and Foreign Affairs, CEFC, EHESS, EFEO, GIS Asie, INCAS, Waseda University

Staff : Researchers: Cécile Sakai (Director, Literature), Sophie Buhnik (Geography), Mathieu Capel (Film Studies), Guillaume Carré (History), Rémi Scoccimarro (Geography).

Administration assistant : Maki Mikasa (Management), Miki Nakajima (Programming), Sylvie Beaud (Communication), Yūko Shimizu (Librarian).

Website : www.ifre.fr/c/225

Keywords : Japan, social sciences, culture and society, globalization, space and environment, demography, modern history, contemporary literature and cinema.

At a glance

The French Research Institute on Japan is housed at the “Maison Franco-Japonaise” and carries out research on the cultural, social and economic transformations affecting Japan as a consequence of globalization, with a particular focus on the themes outlined below.

Research axes

- Environment, Spaces, and Populations
- Conditions of Contemporary Culture: Heritage and Invention
- Structural changes, inequalities and the emergence of new social compromises in Japan

Main research projects

UMIFRE 19 hosts 5 permanent researchers, including its director, and 16 affiliated researchers who conduct research on various aspects of Japanese society and culture.



Cécile SAKAI

The main themes of the permanent researchers include:

- Post-Fukushima Japan (Crisis, ruptures, and new dynamics in Post-disaster Japan; Energy Policies)
- Demography and Urban Dynamics
- Translation, Culture and Critique: Possible worlds in the 21st Century
- New Devices, New Images: Cinema and the Media context

- Social Mobility, Inequality, and Solidarity
- Consuming in Japan, Consuming Japan
- Social history of Japanese Kansai cities from the end of the Edo period to the Meiji Era (1850-1900).

UMIFRE 19 organizes around 80 academic events per year, including international symposiums, conferences and seminars conducted in French, Japanese and English.

UMIFRE 19 also holds a monthly seminar to provide methodological support to French-speaking Master and PhD candidates studying in Japan.

Recent publications

Ebisu Études japonaises, no. 53, “1914-18: A World war? The Japanese Perspective”, 2016. (Latest issue of the academic journal published by UMIFRE 19) <https://ebisu.revues.org/1817>

BUHNIK Sophie, «The dynamics of urban de-growth in Japanese metropolitan areas: What are the outcomes of urban recentralisation strategies ? », *Town Planning Review*, 88 (1) 2017, pp.79-92.

<http://online.liverpooluniversitypress.co.uk/toc/tpr/88/1>

CAPEL Mathieu, *Évasion du Japon. Cinéma japonais des années 1960*, Paris, Les prairies ordinaires, coll. « Cinéma », 2015, 405 p.

CARRÉ Guillaume, «Penser les statuts sociaux du Japon prémoderne (XVIe-XIXe siècles)», *Histoire, Économie & Société*, 2-2017, Paris, Armand Colin, pp. 4-29. <http://online.liverpooluniversitypress.co.uk/toc/tpr/88/1>

SCOCCIMARRO Rémi, «Le Japon, puissance inclassable» and «Le Japon : modèle en panne, société en crise ? », in Balaresque Nicolas (ed.), *Géopolitique de l'Asie*, Paris, Nathan, 2017, pp. 185-203 et pp. 204-220.

SAKAI Cécile (co-dir. Michael Bourdaghs, Kono Kensuke, Toeda Hirokazu, Wada Hirofumi), *Kawabata Studies – 21 seiki ni yomitsugu tame ni (Kawabata Studies – Rereading Kawabata in the 21st Century)* (in Japanese), Tokyo, Kasama sho.in, 2016, 312 p.



What is the specificity of FRIJ compared to the other CNRS units in Japan?

It is very simple: our subject is Japan! While the other units will focus on a specific scientific topic, we may tackle the whole range of humanities and social sciences, but always with a Japanese perspective – or opening to comparative and regional perspective on Asia. Thus all the unit researchers, we are specialists of Japan: before joining our unit, even the youngest usually have already spent three to five years in Japan and we all master the Japanese language. In principle, we have all a dual profile, being specialist of Japan and of a scientific discipline, such as geography, history, economy, cultural studies.... Developing a true expertise on a country requires for all of us a deep commitment, both intellectual and personal, especially when it is a geographically distant country with strong cultural differences, such as Japan.

So, you are performing areal studies?

That's right. In fact, even if the concept of “area studies” came out in the US in the 1950's, and was redefined about 30 years ago, France has a long tradition of running research units overseas and, right now, the Ministry of Europe and Foreign Affairs has the largest overseas network featuring 27 research units on the five continents. I feel it very important to develop and maintain knowledge and expertise about the main world cultures and nations. First it is an enrichment which will nurture the domestic scientific basis: humanities and social sciences are no longer an “ivory tower” and international confrontation of ideas is a necessary mutual condition for development. Second, in our fast moving world environment, it is necessary to have deep knowledge of the other cultures and ways of thinking. To take one topical example out of Japan, it is necessary to have a deep expertise of the Middle East to understand the present religious radicalism that we see in many locations of the world.

Does that mean that you consider yourselves as diplomats?

Of course not. But yes, I think that we participate somehow to the diplomatic mission. Besides our world network is under the authority of the French Ministry of Europe and Foreign Affairs as well as, on a scientific side, of CNRS. This is also clearly the opinion of Mr. Richard Yung, a French Senator who recently conducted a public study on our network: “the researchers established close links with the local scientific communities which contribute, even indirectly, to the French diplomacy”. In his report, Mr. Yung even calls for involving more our units into the public decision-making, by improving the dissemination of the results of our research among diplomats and policy makers.

Your unit seems to have a long history...

It is true that we are bearing a long and prestigious heritage, which makes it very challenging for us. Our unit is the French part of the “Maison franco-japonaise” (meaning the French-Japanese House but we always use either the French or the Japanese name “日仏会館”), a center for cooperation which was created in 1924 by two renowned personalities: the French Paul Claudel, at the time Ambassador of France but also a famous poet and playwright, and the Japanese Eiichi Shibusawa, famous industrialist, widely known as the “father of Japanese capitalism”. They both shared a vision full of ambition.

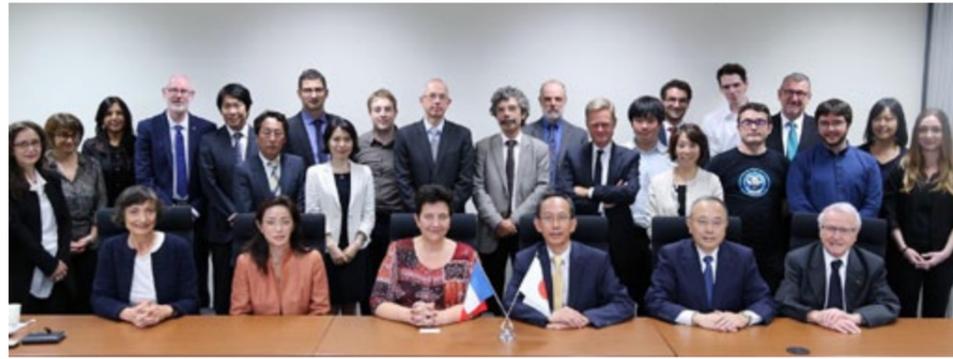


Maison Franco-Japonaise Building in Tokyo, hosting the FRIJ

At that time, Japan scholars wanted to open up to outside ways of thinking and the “Japanese school” within the French researchers was very limited and needed to be reinforced. Now, the Japanese studies related to the language and/or the civilization have well developed among the French universities. This represents about 5000 students studying and 250 specialists either teaching or researching on Japan. This means of course a lot of bilateral collaborations between Japan and France and our unit works as a unique hub in Social and Human Sciences, between all the networks formed by these specialists, both in France and in Japan. And the Japanese part of this Structure is now a Foundation under the Japanese public law, which hosts our unit, maintaining the same aim of French-Japanese Scientific and Cultural Cooperation.



A conference organized by FRIJ, 2017



© UMI-JFLI / Frédérique Vidal, France's Minister of Higher Education, Research and Innovation, visited JFLI in October 2017



UMI JFLI Japanese-French Laboratory for Informatics

FAST FACTS

Date of creation : January 2012
Director FR : Phong NGUYEN Phong.Nguyen@inria.fr
Director JP : Kae NEMOTO nemoto@nii.ac.jp
Staff : JP: 10 / FR: 6 (including 2 permanent)
Number of intern students : 5
Number of PhD students : 2
Number of post-doc : 4
Main events : French-Japanese workshop on Cybersecurity (Tokyo, Avril 2015 and 2017), JFLI Day (Tokyo, March 2016), Joint JFLI-KYUDAI Workshop (Fukuoka, Sept. 2017), Internship Seminar (Tokyo, July 2016 and 2017), Visit of France's Minister of Research (Tokyo, October 2017)
Involved Cities : Paris (France) and Tokyo (Japan)
Involved Institutions and Laboratories :
 • From France : CNRS, Inria and UPMC (Université Pierre et Marie Curie)
 • From Japan : University of Tokyo, Keio University and NII (National Institute of Informatics)
Website : <http://jfli.cnrs.fr>



Phong NGUYEN



Kae NEMOTO

At a glance

The French-Japanese Laboratory for Informatics was first created in 2009 as an International Associated Laboratory (LIA), and became an International Joint Unit (UMI) in 2012. Its main goal is to develop joint research projects in computer science between France and Japan, and to encourage scientific exchanges between French and Japanese laboratories in computer science.

Missions and research topics

Research carried out at JFLI deals with five areas of computer science research : Next-generation networks (analysis and models, mobile networks, sensor networks); Images and Multimedia; High-performance computing; Software, Programming Models and Formal Methods; Quantum information processing.

Recent research projects

Networks (SDN, wireless networks, multiplex networks, network algorithms), Images and Multimedia (image falsification detection, geometric algebra, computer graphics, global illumination), Cybersecurity (next-generation cryptography), Formal Methods (applications of geometry of interaction, applications to information security).

Recent Grants

Inria-JSPS Associate Teams CRECOGI (NII) and LOGIS (Keio Univ), JSPS Kakenhi, JSPS mobility, Team Erasmus Mundus mobility.



The famous Akamon (or "Red Gate") of the University of Tokyo

Interview

Phong NGUYEN, Director



Do you consider it meaningful to come overseas and work on a long term basis in a joint laboratory?

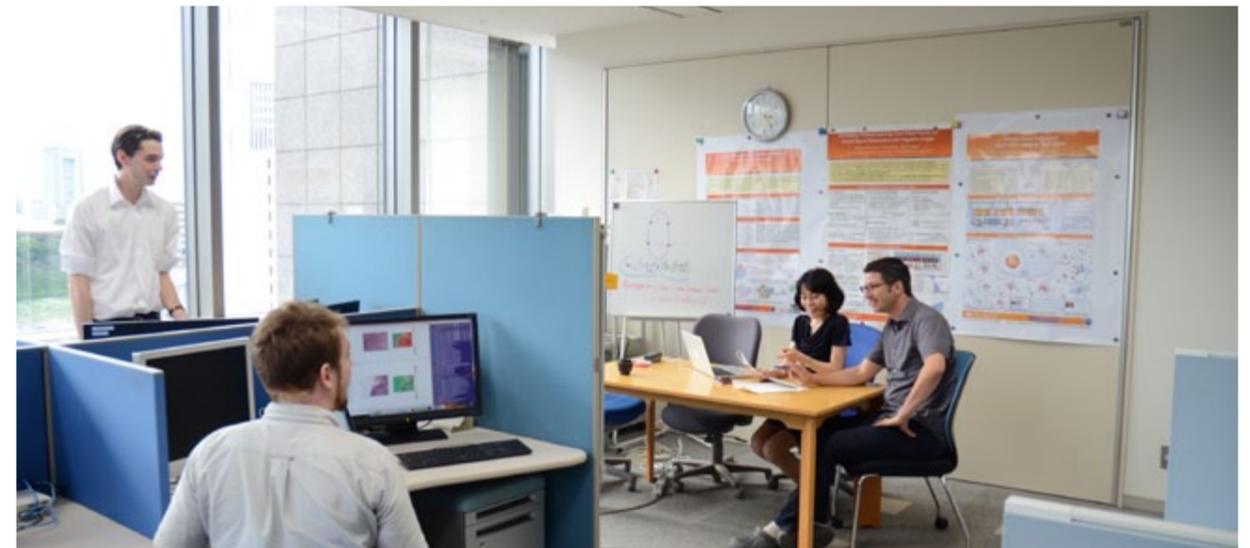
Absolutely. It is very rewarding to experience a new environment and to be challenged with different ways of thinking. In France, we tend to have a universalist view of the world, in the sense that we like the idea of having universal values and principles which are true anywhere in the world. So we can easily believe that there is only one way to do research, which of course is not the reality. It is not a matter of being right or wrong, but rather to look at things from a different angle or to use a different approach. In science, cultural aspects are also meaningful, and it takes time to apprehend these differences: to give an example, I cannot run a working group in Asia the same way as I was doing in Paris. This is where a long-term mobility can really add value, compared to short-term research visits. The UMI is a unique structure which can bring many benefits to all the involved research institutions and also to each individual researcher. But it represents a significant investment for CNRS and its partners and I hope that they make sure to get back all the scientific and human profit from it.

Is there a specificity about collaborating with Asian partners?

I believe that my previous comments are valid for any overseas joint laboratory, but obviously, France is culturally closer to other European countries and the United States than Asian countries. And that is one of the reasons I'm here: I did my postdoc in the US, and afterwards, I was involved in several European projects, so I wanted to experience Asia, which has led me first in China and now in Japan as director of JFLI in Tokyo. Not only is Asia very different from Europe, there are also many differences within Asia. I was born and raised in France, but as my name indicates, I am of Vietnamese origin. Vietnamese cultural values were transmitted to me, yet I now realize that it is only when actually living in Asia that I can fully apprehend some of them. Perhaps that makes the UMI model most meaningful here, both for French and Asian partners. Living in the country is irreplaceable, both on a scientific and personal point of view. For instance, teaching, advising students, applying for grants are very helpful to understand a country.

On another issue, JFLI has many parent research institutions. Why is that?

All the UMIs have many scientific partners, both in France or Europe, and in their host country. They work as hubs between scientific networks. But it may be true that, because JFLI deals with informatics, it has the specificity to require less infrastructure compared to other fields: our equipments are usually inexpensive, and even supercomputers can be accessed remotely. So we are not attached to one laboratory in particular, which makes it easier to bring together several scientific partners and to introduce new topics, like artificial intelligence. Besides, interacting with multiple institutions provides more information on the research ecosystem.



JFLI Lab in National Institute of Informatics



© UMI_JRL / Humanoid robots for human-assist device evaluation

UMI JRL Joint Robotics Laboratory

FAST FACTS

Date of creation : December 2008

Director JP: Eiichi Yoshida / e.yoshida@aist.go.jp

Deputy Director FR : Abderrahmane Kheddar / kheddar@gmail.com

Staff : full time 11, part time 8 / **Nb of PhD students** : 7

Nb of post-doc : 1 / **Nb of laboratories** : 1

Nb of co-publications : 42 journals, 59 International conferences

Main events : Visit Officer Ministry of Finance, March 17th, 2017

Visit Delegation IHEST, April 5th, 2017

Steering Meeting AIRBUS-CNRS-AIST, April 27th, 2017

Visit METI Parliament Secretary, July 27th, 2017

Visit of the Ministers of research and education of the G7 countries 2016

Involved cities : FR (Montpellier, Toulouse, Paris) ; JP (Tsukuba, Tokyo)

Partners : National Institute of Advanced Industrial Science and Technology (AIST) (JP); CNRS (FR)

Industrial partners :

France : AIRBUS (air plane manufacturer), MICHELIN (tire manufacturer)

Japan : TOTO (house implements), APLICA (baby/child products), AISIN (automotive sector products), Mitsubishi Electric (NEDO project in factory visualization)

Website : <https://jrl-umi3218.github.io/>

At a glance

The JRL was promoted from an LIA to an UMI in December 2008. The first mandate was renewed from December 2012 for a 4 years term up to 31 November 2016 with an extension up to 31 December 2016 for a new start. The UMI is a CNRS full-flagged laboratory lasting four years, renewable after an evaluation. For AIST, the JRL was a collaborative research team (CRT) until 31 March 2015, and was promoted as a Research Laboratory under the Department of Information Technology and Human Factors, which gathers six Research Units, among which the Intelligent Systems Research Institute, since 1 April 2015. The JRL main objectives is to achieve quality research on advanced complex robotic systems and science, with a focus on applications with economic and societal stakes.

Missions and research themes

The JRL is a medium-size research unit, with a high-dynamic mobility and flow exchange of its research members. Although the research objectives address a large panel of robotic topics, JRL focuses on specific themes which balance between the necessity of sustaining the results and catalyzing robotic research exchanges between CNRS labs and AIST, that are:

- Humanoid robotics with a focus on multi-contact planning, control and model-based optimization, retargeting;



Eiichi YOSHIDA



Abderrahmane KHEDDAR

- Interaction and advanced interfaces;
- Human modeling and applied neuroscience.

There is a strong integration and open-source software development policies at JRL. It is thanks to such efforts that complex demonstrators are achieved.

Main research projects

CNRS-AIRBUS-AIST Joint Research Program, EU projects : FP7 : VERE, ROBO-HOW, KOROIBOT, H2020 COMANOID, Several JSPS Kakenhi projects

Exhaustive list of projects

- JSPS Kakenhi Houga • JSPS Kakenhi B • Japan (AMED) – German (DFG/BMBF) funding for Computational Neuroscience 2013-2016, understanding energy optimization during hitting (impact) • EU FP7 STREP Koroibot • JSPS Kakenhi B : Beyond Multi-Contact Planning • EU FP6 Marie-Curie Ongoing grant • EU FP7 IP RoboHow.Cog project • EU FP7 IP VERE project • EU H2020 RIA COMANOID • AIRBUS Group – JRL Joint Research Program • JSPS Kakenhi B : Cutting edge Multi-contact planning • JSPS Kakenhi A: Comprehensive dynamics theory for anthropomorphic motion synthesis • METI/AMED : Robotic Devices for Nursing Care Project • JSPS Strategic Young Researchers Overseas Visits Program for Accelerating Brain Circulation • NEDO : International R&D and Demonstration Project in Environment and Medical Device Sector / the International R&D and Demonstration Project on Robotics Field (USA) / the R&D on Disaster Response Robot Simulator based on the Choreonoid framework • NEDO : International R&D and Demonstration Project in Environment and Medical Device Sector / the International R&D and Demonstration Project on Robotics Field (USA) / the R&D of disaster response humanoid robot : HRP-2Kai • JST : Innovative Cybernetic System for a ZERO Intensive Nursing-care Society • Teijin Limited (Private Funding) : Pilot research for workload reduction during labor tasks through support suit with motion and vital sensor • Aprica Children Products (Private Funding) : Research on prediction of postures of infants with childcare products • TOTO Limited (Private Funding) : Research on human-centered design of daily-life support products in living space, FY 2016-2017 • METI : New market-creation oriented standardization for wearable waist assisting robot, FY 2015-2016

Involved laboratories

French side : University of Montpellier, LIRMM, LAAS

Japanese side : University of Tsukuba, Tokyo University of Agriculture and Technology

Other country : None

Interview

Abderrahmane KHEDDAR, Deputy Director

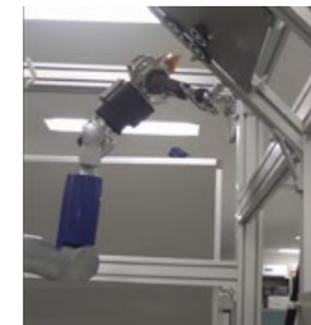


What is the origin of JRL?

At start, it is the vision and the scientific affinity of two researchers: the French Philippe Coiffet, then at the Versailles Robotics Center, and the Japanese Kazuo Tanie, then Director of the AIST Intelligent systems research institute. They worked together and designed this collaborative project on humanoid robotics. They quickly understood the interest French and Japanese have to work together: we look at the same problem, but from different angles. The difference of perspective and of culture brings creativity, complementarity and new ideas, even on subjects that you think you know well. About robotics, obviously there have been scientific skills that the French have which were of interest for the Japanese and vice versa.

And this project worked?

Absolutely. JRL has become one of the leading world laboratories in its fields. We are frequently invited to the best world conferences on robotics. We could receive the attention of leading industrial companies which we are collaborating with, notably the Airbus Group. Most importantly, we could expand our researcher community, including training a lot of young researchers.



Nat bobbing humanoid (with Actus)



Multi-contact planning and control algorithms

What is the key factor of this success?

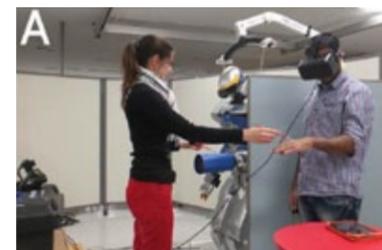
This question reminds me a conference I was recently attending in Beijing and where we were discussing about what characterizes the human intelligence. Then Rolf Pfeifer, the famous specialist of cognitive robotics, came out with this answer: it is human capacity to collaborate. I fully agree with this idea. Collaboration is the basis of the intelligence. And this is all about what is an UMI. It brings the capacity to put together in a same location different cultures, different visions and it brings new ideas. Besides when you think about the world scientific leaders in any given field, you usually recall about researchers and not about the labs. Yet the environmental structure is important and you need the right framework: the UMI is really a catalyst which makes it possible to confront the cultures and the views on a daily basis.

This concept of international laboratory is easy to conceive, but you need the proper experience and administrative tools to actually build and run it. CNRS has got it for years. In fact, it is really

part of CNRS DNA as, even on a purely domestic basis, CNRS runs most of its laboratories in exact and natural science jointly with universities, other research institutions or even private companies. CNRS just extended internationally its domestic way of operating research units.

So, for a researcher, it is worthwhile working in a UMI?

As I said, working in a UMI, you benefit on a daily basis from the emulation coming from the confrontation of different cultures, ideas and perspectives. It is very stimulating and very efficient. Also the UMI are working as a true hub connecting networks of specialists in Japan, in France and in Europe. This also represents a wonderful opportunity for the UMI researchers. And, last but not least, you can apply to calls for projects in Japan, in France and in Europe. For example, our COMANOID project (standing for Multi-Contact Collaborative Humanoids in Aircraft Manufacturing) is a RIA four-year European research project that started in January 2015 as part of the Horizon H2020 program.



Humanoid embodiment



© UMI LIMMS

UMI LIMMS Laboratory for Integrated Micro Mechatronic Systems

FAST FACTS

Date of creation : 1995

Director FR : Eric LECLERC / eleclerc@iis.u-tokyo.ac.jp

Director JP : BeomJoon KIM / bjoonkim@iis.u-tokyo.ac.jp

Staff : 36 ; **Doctorants :** 2 ; **Post-doc :** 8

Laboratories : 16

Co-publications : 230 journal papers, 300 communications in international conferences since 2004 ; **Events :** Regular seminars, 1 to 2 workshops and ~10 laboratory tours a year

Cities : Tokyo, Japan, Lille, France

Industrial partners : L'Oreal, Nikon Essilor Joint Research Centre

Website : <http://limmshp.iis.u-tokyo.ac.jp/>

Institutions and partners :

French side : CNRS ; For the SMMIL-E project : CNRS, Centre Oscar Lambret, Université Lille 1 ; For the iLite project : DHU hepatinov, P Sud, UTC, ENS Saclay

Japanese side : University of Tokyo, Institute of Industrial Sciences

Other countries : For EUJO-LIMMS : Switzerland-Ecole Polytechnique Federale de Lausanne, EPFL / Germany-Department of microsystems engineering of the University of Freiburg, IMTEK / Finland-Valtion Technical Centre of Finland, VTT / Netherlands-University of Twente, MESA+

At a glance

LIMMS, Laboratory for Integrated Micro Mechatronic Systems, is a joint laboratory between CNRS (INSIS – Institute for Engineering and Systems Sciences) and The Institute of Industrial Science of the University of Tokyo. LIMMS researchers are hosted in 16 research groups mainly located on Komaba Research Campus of the University of Tokyo. Since its creation in 1995, the laboratory has been working in the field of micro/nanotechnologies and Bio-MEMS. In April 2004, the laboratory acquired the status of International Research Centre from CNRS and IIS. In 2016/2017, more than 60 people were involved in LIMMS activities including Host Professors and their teams, CNRS researchers, engineers, JSPS post-doctoral fellows, contract post-docs, PhD students, Master's students and administration staff.

Since 2011, LIMMS became the European Union's first international laboratory in Japan called EUJO-LIMMS and has been hosting researchers from Ecole Polytechnique Federale de Lausanne in Switzerland, University of Freiburg in Germany, Valtion Technical Centre of Finland, and University of Twente in the Netherlands. In 2014, LIMMS inaugurated a mirror platform in Lille in France through the SMMIL-E project, Seeding Microsystems in Medicine in Lille-European-Japanese Technologies against cancer. Since 2016 LIMMS is involved in investment for the future via the project iLite dealing with innovation in liver tissue engineering. LIMMS celebrates its 20th Anniversary in 2015.



Eric LECLERC



Beom Joon KIM

Objectives and research topics

Since its creation, LIMMS has been promoting the concepts of micro and nanotechnology. Based on its expertise, the laboratory operated on 3 research axes:

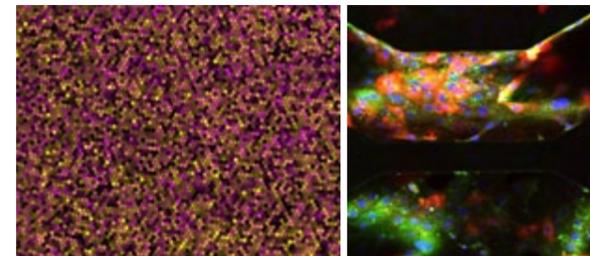
- Development of Nanotechnologies
- Micro and nanotechnologies applied to Biology
- Advanced integration of MEMS and NEMS functions

In 2016, LIMMS has highlighted 4 general fields of applications related to clinical and translational research, Integrative Bioengineering, Energy, and Smart sensors in society.

Main research projects

- **Advanced MEMS, Smart sensors** : "on-chip" integration of distributed control functions and components such as actuators and sensors. Functions with new materials like polymeric flexible substrate and new processes for low cost nanostructuring and large area MEMS have been launched too. LIMMS leads advanced activity on silicon nanotweezers for molecules and cell handling. Breakthrough results were obtained from sub atomic surface characterisation by AFM, lab in TEM and in liquid observation.
- **Integrative bio engineering** : the characteristic dimensions of biosystems addressed by our biochips vary from some millimeters for cell/tissue engineering applications, down to few tens of nanometers when we work on applications to biomolecules. High impact publications were obtained in vitro molecular programming and organ on chip technology
- **Energy** : LIMMS works on the high density formation of quantum dots in III-V materials to enhance performances of lasers, phononic, heat transfer at the nanoscale, energy harvesting. Breakthrough results were obtained in heat focussing device.
- **Clinical and translational research** : SMMIL-E: includes the setting-up of a new platform of the Institute of Industrial Science of the University of Tokyo in the Lille university-hospital area, close to medical teams. First research location of IIS out of Japan, the implantation is backed by CNRS, Centre Oscar Lambret and Lille 1 University as a UMI, International Joint Unit, mirror site of LIMMS/CNRS-IIS UMI 2820. Scientific activities encompass BioMEMS research against Cancer, technology development and bio-related experiments.

iLite: LIMMS was successfully associated to a Research Hospital University (RHU) project funded by the French investment for the future. iLite project for Innovative Liver Tissue Engineering aims at integrating macro and micro tissue engineering knowledge, innovative in vitro and in silico methods, to improve and propose solutions in liver therapy. iLite is the research project associated to the Hospital University Department (DHU) called HepatinoV.



Digital droplets microfluidic

Interview

Eric LECLERC, Director



What brought you at LIMMS?

In fact, my relationship with LIMMS started a long time ago, when I pursued a post-doctoral position here in 2000. Among the possibilities I had for this position, I selected LIMMS because of the image full of mystery I had of Japan at that time, at least more than the possible alternatives, Germany or Norway. The fact is LIMMS has a quite long history as it was established in 1995 by two visionary scientists, Prof. Jean-Jacques Gagnepain, Scientific Director of the CNRS Engineering Science Department, and Prof. Fumio Harashima, Director of the Institute of Industrial Science of the University of Tokyo. It turned into an UMI in 2004 and has remained such ever since, thus becoming the oldest UMI in Asia. Nonetheless, after my stay here, I went back to France where I kept up pursuing my research career.

So what brought you back at LIMMS?

During all the following years, I had been keeping regular contacts with friends in Japan and colleagues in LIMMS and even collaborating with them on several research projects. Then in the late 2012, I have been proposed to come back in LIMMS as a director. At that time, LIMMS had accomplished over the years a lot of impressive achievements: many collaborative projects had been successfully completed, LIMMS managed to get EU funding to become the first European laboratory in Japan, associating four countries in addition to France and Japan. LIMMS was developing into very attractive new technological areas. As an example, after Prof. Yamanaka was awarded the Nobel Prize in 2012, LIMMS has been one of the many players in Japan working hard in the field of iPS (induced pluripotent stem cells), interestingly following a mixed bio-engineering approach while in France we were keeping focused on more fundamental biology research. Also the management aspect of the position has been very appealing to me, especially in an international context. When you lead an UMI, you somehow make "daily diplomacy" and I like it very much. So, further keeping developing LIMMS has just been a huge, but irresistible challenge for me!



Institute of Industrial Science, the University of Tokyo

Japan – Centre Oscar Lambret in France

Is Japan keeping its mysterious image for you?

Very soon after I arrived in Japan for the first time, I have felt very comfortable living in Japan. I believe that the Japanese and the French are very close one of the other culturally. They do share a lot of common values: the relation to the history, to the culture, to the gastronomy... At the same time, they also like to cultivate a sense of melancholia. They both have this ambivalent attitude of being very proud of their culture, while being able to be critical at the same time. Maybe the Japanese are more faithful to their tradition and values, so it happens that some attitudes and situations remind me of my parents' generation. One aspect of the Japanese society, which I like particularly, is that it still exists a lively local community activity: even if Tokyo is one of the largest city in the world, it is just in fact a multitude of small villages.

And professionally, what is your image of Japan?

In this matter also, I am feeling very comfortable working here. Especially, I feel our Japanese partners at the Institute of Industrial Science of the University of Tokyo have the right balance between fundamental research and the wish to come up with actual industrial applications. It means they are working on 10 to 15-year projects with several intermediate pragmatic exit points. This proximity of the university with the industry dates back from its origin and they have been able to maintain it. The professors and researchers are aware that they participate to the development of their country, they are proud of it and they strongly wish to actively contribute to it. Personally I feel this attitude very motivating.



LIMMS photo 2017



© UMI LINK / 6th NIMS-UR1-CNRS-SG workshop in 2016



UMI LINK Laboratory for INnovative Key materials and structures

FAST FACTS

Date of creation : 1st January 2014 (opening ceremony, 28th Oct. 2014)

CNRS Director : Fabien GRASSET / GRASSET.Fabien@nims.go.jp

NIMS co-director : Tetsuo UCHIKOSHI / UCHIKOSHI.Tetsuo@nims.go.jp

Saint-Gobain co-director : David LECHEVALIER / LECHEVALIER.david@nims.go.jp

Staff : JP : 7 / FR : 3 (average full-time equivalent : 2.2 permanent staff and 2.8 non-permanent staff)

Number of PhD : 2 ; **Post-doc** : 3 ; **Number of post-doc** : 1

Number of Laboratory : 1 ; **Number of Publications** : 26

Main event : 6 co-organized workshops ; **Involved city** : Tsukuba (Japan)

Industrial partner : Saint-Gobain ; **Research budget** : contributions from Saint-Gobain, NIMS, CNRS, ANR, JSPS, UR1...

Involved Institution and Laboratory :

France side : CNRS-INC, Saint-Gobain R&D Centers (Global Network) / Japan side : National Institute for Materials Science-NIMS, Saint-Gobain K.K.

Mirror unit : Institut des sciences chimiques de Rennes at the University of Rennes 1

Website : <http://www.nims.go.jp/eng/collaboration/hdfqf10000083jv1.html>

At a glance

The UMI LINK is the 1st international chemistry laboratory created in Japan. Such joint laboratory aims at representing an innovative collaboration model between two academic, NIMS and CNRS, and one industrial partner, Saint-Gobain. The UMI LINK was created in January 2014 for a period of 5 years (January 2014-December 2018) and established at NIMS in Tsukuba Science city in October 2014. The laboratory Institut des sciences chimiques de Rennes (ICSR UMR 6226) at the University of Rennes 1 (UR1) was selected as the first CNRS "mirror unit" in France for the UMI LINK.

Missions and themes of research

The mission statement of LINK consists of 4 goals :

- Setting up joint basic research projects with researchers of multicultural background,
- Reinforcing relationship between French-Japanese academic and industrial communities,
- Stimulating participation in calls for joint projects,
- Ensuring education and support career development for young researchers.



Fabien GRASSET



David LECHEVALIER



Testuo UCHIKOSHI

Research activities at LINK include the creation and synthesis of novel materials, the innovative refining processes and the characterization of physical and chemical properties.

The research performed in the UMI is a part of the basic science covered by the CNRS, the NIMS and Saint-Gobain on nanotechnology innovations for the building materials industry. The selected projects focus on the synthesis and characterization of nanocomposite materials involving metal atoms clusters and oxides. The potential of this class of new materials for applications in the fields of energy, environment and photonic is explored. The goal of LINK is the elaboration of model materials (powder, colloids and thin films) comprising the optimization of experimental processing procedure and an accurate characterization of physical and chemical properties in order to establish the correlations between physicochemical characteristics and potential applications.

LINK is built on a win-win partnership model and relies on the strong relationship between all partners. Our ability to build a sustainable project and work together across borders and cultures is considered as equally important as pure academic outputs. The terms and conditions of the collaboration and especially the governance rules of the collaboration are defined by a Master Collaboration Agreement. The collaboration is reviewed annually by a Steering Committee composed of representatives of the 3 partners. In parallel, a Scientific Committee reviews the scientific activity and makes suggestions on the projects and for the corresponding resources.

Research axes

- Energy and Environmental Materials
 - Building and Construction Materials
 - Optical Properties and Multifunctional Coatings
 - Catalytic Surface Modification
- Main Research project
- Synthesis and Characterizations of New Nanocomposites Materials based on Metal Atoms Clusters and Oxides

Interview

Fabien GRASSET, Director



How have you ended up as CNRS director of this joint Japanese-French research laboratory? Is it only mere chance?

Chance is always very important but not only. My chance has been the decision of NIMS, Saint-Gobain and CNRS to create an UMI at NIMS but it was also the result of a 20-year long story. It started in 1997 when I first came to Japan to visit a friend of mine who was a postdoctoral fellow at NIRIM (now NIMS) in Tsukuba. For two weeks, I travelled across Japan, from Nagasaki to Sapporo, and I just felt passionate about Japan and its inhabitants. In 2000, thanks to Prof. Jean Etourneau, I received the opportunity to come here by myself as a JSPS-CNRS postdoc for 18 months in the group of Prof. Hajime Haneda and Prof. Naoki Ohashi. Since that time, I have been keeping collaborating with them at NIMS, which is an amazing place for making science. Thanks to them I came several times to Tsukuba for regular short-term visits, from a few days to three months. Of course, I have to mention also the strong support of my family, especially my two kids. To shorten it, that's how I could join the LINK Laboratory in October 2014.

Has living in Japan been a challenge to you?

Of course. To start with, despite all the time elapsed, the language remains as an unsurmountable barrier for me. Japan is a wonderful and fascinating country, but it is also full of contrasts and surprises, where it is easy to get lost in translation to quote the famous film by Sophia Coppola. At the same time, the Japanese are very close to the French, notably when it comes to tradition, sense of excellence and quality that you find in both countries in gastronomy, in craftsmanship or... in science and technology. Also the Japanese hospitality is very strong and the sign "Welcome in Japan" that you can read when you arrive in airports are not empty words, but a daily reality that I have been experiencing for 20 years. At the end of the day, even if I faced some difficulties, it has been very easy to adapt to this country, mainly thanks to the Japanese's empathy, modesty and self-restraint. Also I often tend to follow my intuition by keeping in mind that I am only living here for a limited time and wishing to participate as much as I can in the Japanese culture and traditions.



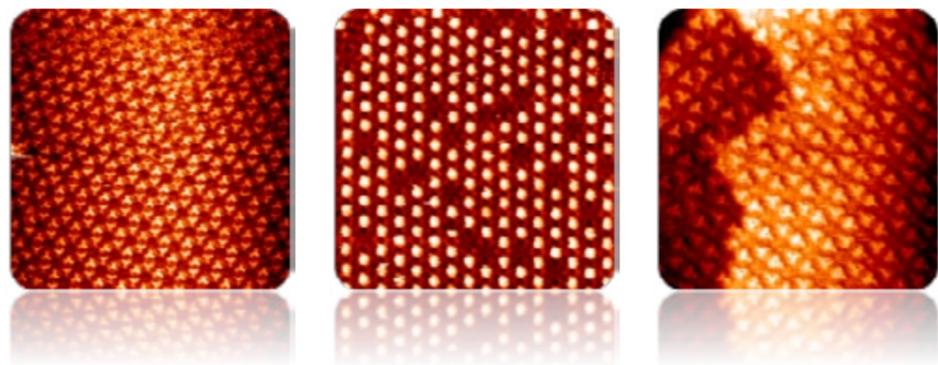
Building GREEN-MANA of NIMS where the UMI LINK is located.

As one of Director, how do you cope with this culture gap?

As I said, it has been a long collaboration, so we have been able to form a small homogenous team divided almost equally between experienced researchers and younger students and postdocs. One key factor for success has unquestionably been our mutual commitment to succeed, to push on going up and to support each other. We are also sharing Japanese and French management methods and good practices on a daily basis. Most of the experienced researchers have a long international practice. For instance, my predecessor as LINK Director, Mari Kono of Saint-Gobain, is a Japanese who lived in Canada several years. Thus she was very good at bridging the cultures and understanding the various points of view. When I arrived at LINK, Mari and I were convinced that building the team on common values is a key factor for success. Still today, we are working in this way with David Lechevallier and Prof. Tetsuo Uchikoshi, co-directors of LINK. One of the values is "pleasure", meaning that we have to make sure that every researcher actually enjoys working hard at LINK. Personally, it is also important to give back what I received and to try to prepare the next UMI's generation. Lastly, we have also been careful about keeping the ability to collaborate at distance with our collaborators in France at the University of Rennes 1 or Saint-Gobain research centers. Our industrial partner, Saint-Gobain, is very experienced in this matter as it operates a global network of major research centers located in Brazil, China, France, Germany, India, Korea and USA. Although it is a real challenge, I think that we have been quite successful in developing an efficient academic-industrial collaboration over the distance.



New-Year party "Shinnenkai" 2017 of UMI LINK and COE NIMS-Saint Gobain.



© UMI 2B-FuEL / Building-Blocks for Future Electronics

UMI 2B-FuEL Building Blocks for Future Electronics Laboratory

FAST FACTS

Date of creation : 1st January 2017

Director FR : André-Jean ATTIAS / andre-jean.attias@upmc.fr

Director KR : Eunkyong KIM (Yonsei University) / eunkim@yonsei.ac.kr

Director KR : Jeong Weon WU (Ewha Womans University) / jwwu@ewha.ac.kr

Nb of Laboratories : 1

Main events : Launching by the end of 2017

Involved institutions : (France) CNRS-INC, Université Pierre et Marie Curie (UPMC) ; (Korea) Yonsei University, Ewha Womans University

Academic partners : (France) Universités de Aix-Marseille, Lyon et Strasbourg

At a glance

The UMI 2002 '2B-FUEL' is the first one established in Korea. This joint research unit was created in 2017 in Seoul in partnership between CNRS, Université Pierre et Marie Curie, Yonsei University, and Ewha Womans University. This UMI builds on well-structured and fruitful partnerships previously established between France and Korea through two CNRS international cooperation tools: one International Research Network (GdRI) and one International Associated Laboratory (LIA).



Location of the UMI at Yonsei University (Advance Science Building)



André-Jean ATTIAS



Eunkyong KIM



Jeong Weon WU

Missions and research topics

2B-FUEL aims to imagine new materials and explore original routes to use them in novel device architectures in view of providing flexible (and disposable) organic (opto)-electronics. The multidisciplinary approach developed to achieve these objectives will involve research fields ranging from organic synthesis, to physics, materials science, electronic engineering, and process technology for applications development for organic electronics.

Scientific research topics

2B-FUEL aims to imagine new materials and explore original routes to use them in novel device architectures in view of providing flexible (and disposable) organic (opto)-electronics. The multidisciplinary approach developed to achieve these objectives will involve research fields ranging from organic synthesis, to physics, materials science, electronic engineering, and process technology for applications development for organic electronics.

Major research projects

The main objective of the UMI '2B-FUEL' over the next five years will be devoted to the development of functionalized two-dimensional (2D) materials-based hybrid multilayer heterostructures and molecularly-thin devices for future printed, organic, and large-area flexible electronics towards autonomous and integrated smart systems.

Interview

André-Jean ATTIAS, Director



What led you to create the first UMI in Korea?

I remember very well the starting point of the France-Korea cooperation which has finally led to the creation of the Building-Blocks for Future Electronics Laboratory (2B-FuEL): it was an international conference in Cancun in 2005 where my French fellow researcher, Prof. Audebert from ENS-Cachan, and I met Prof. Eunkyong Kim from Yonsei University. We discussed a lot and came out with the idea to collaborate. First, we could get a funding from one of the Hubert Curien Partnerships (PHC - Star) which are part of the French Ministry of Foreign Affairs' policy. It helped us to organize several workshops, alternatively in Korea and in France. Every time we were meeting, we could enlarge our collaboration, bringing up new scientific partners both from France and from Korea, always of very high scientific level and with whom we developed a very strong personal relationship. With the support of CNRS, we strengthened this network through an International Research Network (formerly known as GDRI) that we established in 2010. The following step should have been



Yonsei University



Ewha Womans University

an International Associated Laboratory (LIA), but the result of our collaboration has been so positive that, when Prof. Jeong Weon Wu from Ewha Womans University suggested jumping to the creation of an UMI, CNRS replied "let's do it, under the condition that a very exciting project be submitted". The UMI (the first one established in Korea) was created last 1st January by CNRS, UPMC, Ewha Womans University, and Yonsei University.

But precisely, why creating an UMI rather than following other forms of collaboration?

Since all the partners share the same scientific ambition, the UMI framework has given us the freedom to pursue our mutual interests with a less restricting way than usual calls for proposal. It was just like if in a dance or a skating competition, we wished to perform a free programme, instead of compulsory figures. Of course, Prof. Eunkyong Kim and Jeong Weon Wu, the Korean Directors and I are now facing the challenge to mobilize all the energies, competences and resources to build up and successfully achieve our project. It is like the writer facing his blank page, as everything in the project has to be created. It is indeed a huge and stressful challenge, but also at the same time it is very exciting and rewarding. Korean and French, we are very complementary and we have so much to learn from each other. For example, from my contacts with my Korean colleagues, I could develop my sense of usefulness by always thinking about the possible industrial application. We have many cultural differences but working together is definitely an enormous advantage and it brings a huge leverage.

So, no worry about moving soon to Korea?

I know that moving and settling into Seoul will be challenging at first. Especially concerning the housing, as I have heard the renting agreements are a lot different compared to France. Nevertheless, I am truly eager to go there. In fact, from my very first contact with my Korean colleagues and from my first trip in Korea, I have always felt very comfortable. As I said before, in this project, we have all developed a strong personal relationship and many of my Korean colleagues have become close friends. When we meet in international conferences, I often have dinner with them, rather than just staying with other French colleagues. This relationship remains even if our paths sometimes diverge. I am also feeling confident because I know I can rely on the Korean Director, Prof. Eunkyong Kim, as much she can rely on me. As an example, last year we successfully submitted a project in the framework of the Global Research Laboratory (GRL) program of NRF. Moreover, beside attempting to insert the UMI in the organization chart of research at Yonsei, she is always looking ahead towards the future and also caring about developing our network, especially associating and forming the younger researchers. This is why I am really looking forward to developing this great scientific and human adventure !



© UMI BMC² / Signature of a research agreement between our lab and pickcell during the Singapore-France Innovation days

UMI BMC² BioMechanisms of Cellular Contacts

FAST FACTS

Date of creation : 2014

Director : Virgile Viasnoff / virgile.viasnoff@espci.fr

Partners : Joint lab : FR : CNRS and ANR ; SG : MBI, NUS and NRF

People : 14 **People :** Postdoc : 4 ; PhD : 4

Co-publications : 10 between 2015-2017

Website : <https://www.viasnofflab.com/>



Virgile Viasnoff

Mission & Research Themes

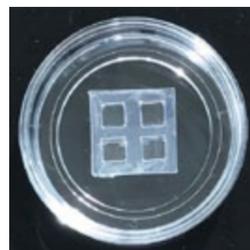
We study the effect of the microenvironment on the cell-cell interaction. We particularly focus on the molecular interactions of cells with the extracellular matrix, the mechanosensitive response of adherent junctions and the cell ability to acquire an apico-basal polarization. Our approach is to reverse-engineer the interactions of cells with their microenvironment by creating protein pattern and artificial microniches that allow a precise control over biomechanical stimuli of cells. Optimal control of cell interactions with their environment then led to decipher its influence over cell-cell interactions in the context of epithelium formation, liver regeneration and cancer metastasis.

Our biophysical approach consists in developing biomimetic interfaces that allow stimulating cells in 3D. We then study from the molecule to the tissue level how force stimulation and microenvironment sensing is integrated at the cellular and tissue level.

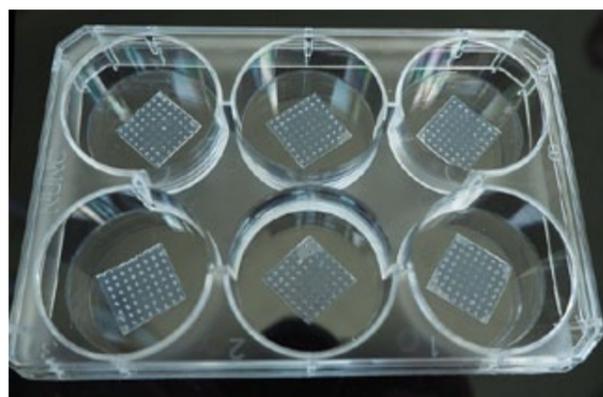
This problem is addressed by combining microfabrication with high and super-resolution imaging as well as advanced biological tool to address the above questions in a very multidisciplinary way. We benefit from the one of its kind environment at MBI that gathers expertise from all these fields under the same program the UMI is participating to.

Ongoing Projects

- Development of artificial microniches (lab and industrial scale)
- 3D superresolution imaging
- Mechanical response of Adherens junctions
- In vitro and in vivo tubulogenesis of apical lumen in liver and mammary gland
- Cancer cell environment sensing



Petri Dish Membwell



Combinatorial control of microenvironment cues in 3D

“ Interdisciplinarity in a multicultural environment : a fruitful challenge. ”

Interview

Virgile Viasnoff, Director



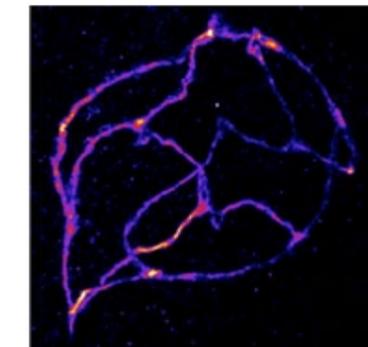
May we ask: “Why Singapore?”, and “how UMI BMC² started”?

I first heard of Singapore in 2009, from a colleague who had moved there in 2006. I then was looking for opportunities to change direction in my research, but not specifically to leave France, since I had joined CNRS only 5 years earlier. However, I got really attracted when the Mechanobiology Institute (MBI) was created, with a mission to group biologists, physics, material scientists, optic engineers, and bioengineers so that they can work hand in hand. The idea was to create a world leading center to understand how mechanics and biology interact, which defined Mechanobiology as a discipline, which it has since become. I felt it was a terrific idea so I took the risk to leave ESPCI to move to Singapore. The CNRS was very supportive. After two years and some nice progress, everyone was convinced that joining forces by means of creating a UMI was a good idea, aiming to bring the best of what both Singapore and France have to offer in the adventure. The UMI was signed in May 2014.

How easy is it to deal with both France and Singapore partners? What are the administrative and scientific pros and cons of managing a UMI?

Unlike men, all UMI are not created equal. BMC² has the great chance to be organically integrated in MBI. We participate to their strategic meetings; we are eligible to Singapore grants and so on. I believe this was key in our ability to raise money rapidly, to develop our own projects and to quickly obtain some very nice results. BMC² has deep relationships with IINS in Bordeaux, through collaboration with colleagues I knew since my PhD thesis. I do not usually say that but we managed miraculously to get the best of both systems with a minimal amount of hassles. In other words, I almost can manage my UMI as a fully independent lab.

Though the UMI is young, you already filed patents and launched two start-ups with your lab. Do you still publish? And how to deal with both theory and concrete innovations?



Single molecule super resolution imaging in 3D

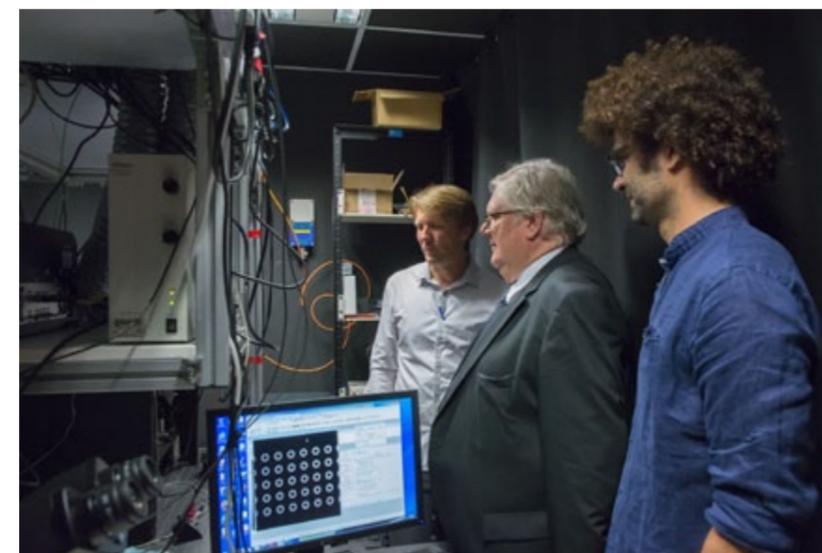
Yes we do publish, and pride ourselves with three papers accepted by two top journals: two in Nature Cell Biology and one in Nature Methods. We had a total of about 10 papers in the past 5 years. The new methods we created associated well with a soaring and trendy field. We mildly deal with theory. We have our own restricted field of scientific interest (tubulogenesis and cell-cell interaction), but along the way we created new methodologies as we always try to keep in mind a broader view on whether our work could also be more useful to the larger community. We were lucky to find 2 nice applications that lead to start-up companies. In fact, we didn't explicitly aim for it. And yet we still have a few more coming, in the pipeline...! I'll attend the next AUR@SIA meeting, meet me there!

How international is BMC²? (Is it strictly FR + SG?)

Administratively, the UMI partnership is purely bilateral, France and Singapore. In the lab we have Singaporean, French, Chinese, Indian, Italian, Birman, Swiss and Australian students and postdocs. It is a great deal to create a common culture and common working ways, but it works. As external collaborators we add UK and US researchers. Just to simplify the equation. But this is the magic of science. It works in a fruitful and productive way. Especially because one can get access to the best parts of every academic system.

What do you expect from AUR@SIA 2017?

Well, a bit of publicity, some useful contacts, an extra boost of energy to pursue our “Quest”, and maybe some unexpected sparkling ideas?!



Presentation to Alain Fuchs (former president of CNRS) of our new commercial prototype for soSPIM imaging, that combines optics and microfabrication to image molecules in 3D inside cells lodged in artificial microniches.



© Cyril FRESILLON / CNRS Photobiologie / Salle Blanche MEMENTO, membre du réseau RTB (Recherche technologique de base).



UMI CINTRA CNRS International NTU THALES Research Alliance

FAST FACTS

Date of creation : Established in 2009, renewed end 2013, pending renewal end 2017

Director : Philippe Coquet / philippe.coquet@cnrs.fr

Partners : Joint lab : FR : IEMN-Lille, XLIM-Limoges, IMS-Bordeaux, LNIO-Troyes, C2N Saclay, ESPCI Paris, MPQ Paris, LPICM-Ecole Polytechnique, IMEP-LAHC-Grenoble, Lab-STICC-Brest, LPA- ENS Paris, Institut Fresnel Marseille, CRHEA Nice. **SG :** NTU / Thales Solutions Asia / UMI BMC², UMI MAJULAB. **JP :** UMI LIMMS, UMI JRL

Industry : Thales : Thales Research Technology France, Ill-V Lab, Thales Systèmes Aéroportés, Thales Optronics, Thales Alenia Space, Thales Underwater Systems

People : Around 60 People : Postdoc: 13 / PhD: 26

Co-publications (2016) : 92 (59 articles)

Website : <http://cintra.ntu.edu.sg>



HE Marc Abensour French Ambassador to Singapore and NTU President Professor Bertil Andersson visit in March 2017



Philippe Coquet



DINH Xuan Quyen



TAY Beng Kang

At a glance

CINTRA UMI3288 is a French-Singaporean joint laboratory between the French National Center of Scientific Research (CNRS), Nanyang Technological University (NTU) and Thales group. Based on NTU campus it has been established in 2009.

With the involvement of the three partners, CINTRA aims to harness the latest in science and technology to develop innovations in nanotechnologies for nanoelectronics and nanophotonics.

Missions & Research Themes

Nanotechnologies, Nanoelectronics, Nanophotonics

Research Axes

- Carbon based materials and devices
- New nanomaterials and structures
- Nanophotonics Technologies

Past projects

Presentation of CINTRA to the French President during his State visit to Singapore in March 2017. Visit of the President of CNRS, Alain Fuchs, to CINTRA and of Thales CTO, Marko Erman in November 2015.



Introduction of CINTRA to the former French President François Hollande during the state visit in Singapore in March 2017 – (photo credit: A*STAR)

“ Exemplifying the added-value of Private-Public Partnerships in scientific research. ”

Interview

Philippe Coquet, Director



CINTRA's 4-year review meeting in March 2017

CINTRA stands for CNRS International NTU Thales Research Alliance. Created late 2009, it was then the second UMI launched in Singapore. Prof Coquet came to Singapore as CINTRA's new Director in September 2013.

Could you please summarize UMI CINTRA's activities?

In a few words, CINTRA develops research activities on Nano-electronics and Nano-photonics technologies, with the objective to harness the latest in science and technology and innovate in these fields. So doing, we promote cooperation between academic and industry researchers in France and Singapore, aiming at making a significant contribution to strengthening pathways between technological breakthroughs and innovation in industry.

Are there key-figures you wish to share?

As of today, 60 people are affiliated to CINTRA, for 46 Full-Time Equivalents, including 26 PhD students, 13 research fellows. Since 2010, over 80 researchers or students from France and Europe have worked at CINTRA, among them 20 PhD students and 50 interns. CINTRA is proud of its scientific production, with more than 500 publications since 2010, of which 60% in journals of increasing Impact Factor. The average impact factor in which our papers are published has increased 3 fold during the past four years, now reaching 6.09. We've been also involved to date in 40 funded projects, and have filed 5 patents.

What are the motivating factors drawing a technological university like NTU and an industrial group like Thales to partner with CNRS?

CINTRA's goal is to transfer advanced academic research to new, highly innovative devices. Our 3 partners share the vision of the complementary between NTU's expertise at developing new materials, CNRS' ability to create new components using these materials, and combining them with Thales' advice and vision as an industrial user. The scientific added value of CINTRA therefore relies on the interdisciplinary of our activities, drawing coherent synergies from materials synthesis, device fabrication, characterization, and multiscale modeling.

Multi-partnered, multi-disciplined, how multi-cultural is CINTRA?

CINTRA is a bridge between various sources of expertise and also a vibrant platform for exchanges between Singapore & France, on research methods, cultures and more largely, way of life, which also favor collaborations with research teams in other countries. Also several nationalities are represented in CINTRA among our 60 affiliates: France, Singapore, Germany, Indonesia, China, Malaysia, Vietnam, India etc....

Last March, UMI CINTRA had its second 4-year review. Could you elaborate on the impact that such review sessions bear on a UMI?

CNRS requires reviews prior to renewing a UMI. They occur every 4 years. A panel of independent scientific experts is assembled to assess the UMI's past and future activities, who then report to the UMI's partners, for their decisions.

More than a strict evaluation session, our 4-year review was very useful, bringing in an external international view on our activities, helping us to benchmark our research versus other international groups and advising our partners on possible future scientific orientations and strategies, so as to reengage the commitment of our partners for the next term.

So, what is CINTRA preparing for the coming years?

We want to push further towards translational research. The first phase of CINTRA (2009-2013) was devoted to setting-up strong foundations for fundamental (upstream) academic research, through the second period (2013-2017) we also developed connections with Thales Global Business Units. For the next term, we want to go forward in this orientation with the development of a few demonstrators, while maintaining a good balance with fundamental research.



© UMI IPAL / 15th International Conference On Smart homes and health Telematics



UMI IPAL

Image & Pervasive Access Laboratory

FAST FACTS

Date of creation : Collaboration since 1998, the UMI was established in 2007

Director : Mounir Mokhtari / mounir.mokhtari@ipal.cnrs.fr

Partners : Joint lab : **FR :** CNRS, UGA (Université Grenoble Alpes), INSTITUT MINES-TELECOM, UPMC, INPT Toulouse. **SG :** A*STAR (I²R, Institute for Infocomm Research and Bio Informatics Institute, BII), NUS (SoC, School of Computing)

Industry : PSA Group, AXA, Dassault System, SPIE Com

People : Around 34 People :

(20 FTE) (15 research staff) /

Project Manager-Liaison Officer:

1 / Part-time admin support: 1 /

Postdoc : 4 / PhD : 13

Co-publications : more than 200

Website : <http://www.ipal.cnrs.fr/>



Mounir Mokhtari



DONG Jinsong

Co-Director (I²R, A*Star) :
(pending replacement)

At a glance

IPAL focuses on Digital health and Inclusive smart spaces to enhance the quality of life of ageing people, in line with the Smart Nation initiative launched in Singapore. While the main motivation and focus of its project lies in building an integrated knowledge exchange framework, the software infrastructure aims at solving the general problem of linking big data analytics with the internet of services in a smart city context.

Missions & Research Themes

- Semantic reasoning for urban data;
- Web and social media data analytics;
- Deep learning and multimodal big data applications;
- Low and high-level methods for egocentric vision;
- Formal verification and model checking;
- Biomedical imaging

Research Axes

- Inclusive Smart Cities and Digital Health New

Ongoing projects

- VHP Inter@ctive

Investment of the Future. Concluded March 2017

- Drainbot, IPAL-NUS NRF funded, led by Nizar Ouarti. Started January 2016 for 2 years
- Merlion, IPAL-BII, led by Thomas Boudier. Started 2016 for 2 years
- City4Age, Horizon 2020 granted. IPAL PI, Started 1st December 2015, for 2.5 years
- Industrial contract: IPAL-PSA PEUGEOT-CITROEN. Smart mobility & Well-being. Started 1st October 2016, for 3 years.
- PULSE, Horizon 2020 "Big data for health". Started 1st November, 2016 for 3 years



Engagement session with the Former President of the French Republic François Hollande, during State Visit in Singapore (March 2017)



IPAL hosted Paris Region President Valérie Pécresse for a demo of smart ageing solutions and presentation of the future SILVER programme



IPAL Director, M. Mokhtari talks about Digital Health & Ageing during Le Monde Smart Cities Innovation Awards

“ Inclusive smart cities and Digital Health ”

Interview

Mounir Mokhtari, Director



IPAL was established in 1998 and became UMI2955 at the start of 2007. Prof Mounir Mokhtari joined in 2009, and became its Director in 2014.

Hello Mounir, how did you get to know the UMI IPAL?

In 2003, I organized in France a conference called ICOST (International Conference On Smart homes and health Telematics) and had the visit of a delegation from Singapore, which I had never heard of before. They were keen to host the conference in 2004, as they perceived a lack of conferences about our theme: Smart homes for independent living... So in 2004 Singapore hosted the conference and I discovered its impressive research ecosystem.

So you met UMI IPAL in Singapore?

Yes, after 2004 I regularly visited NUS¹, and met with the team which founded the UMI IPAL. In 2008 a new director came to IPAL, and as my topic was in demand in Singapore, he offered me to join him to develop IPAL. At that time the only way I knew to do research abroad was to take a sabbatical from my institute². I discovered that I could be seconded to CNRS who could then support me to IPAL. So I went for it, and we started a second research axis for IPAL...

Did the UMI open the door for you to move forward?

Yes, on top of IPAL's original research activity on "Biomedical Imaging" we started a second axis: "ambient assistant living". We ended up changing IPAL's name from "Image, Perception, Access & Language Laboratory" to "Image and Pervasive Access Laboratory".

How interdisciplinary is IPAL?

When I joined IPAL in 2009, its French partners were CNRS and UJF of Grenoble. For the 2011 renewal, we enlarged the partnership to Institute Mines-Télécom and UPMC. With the 2015 renewal, we brought INP-Toulouse and BII in as associate institutes. This multidisciplinary dimension is one of the key opportunities that you have in a UMI that you probably don't find in most labs in France. Working with different research partners like A*STAR or NUS, brings two complementary ways of thinking, one more academic and one more applied to industry.

In terms of personal scientific enrichment, how do you perceive the UMI opportunity?

In France for your own career evolution, you need to be specialised, but my topic is by essence multidisciplinary as human factors are important. So I did the other way around : I went from peoples' needs, how to translate them into technical recommendations, then go back to fundamental research to solve the major societal problem related to independent living.

Can you give us some key figures about IPAL?

We are around 34 people, half from France and half from Singapore for a total of 20 full-time equivalents. 40% senior and 60% young researchers. We truly are international: ASEAN, Middle-East, Spain, and Eastern Europe. We ambition to improve both young and experienced researchers' expertise and career: you join as a young associate professor and then when you strengthen the ability to drive research (HDR), ambition to a Professor position. 100% of our PhDs/interns found either a job or pursued their education. Some stayed for a PhD.

IPAL is involved in 10.9 M€ project-funding with 2.7 M€ to IPAL as effective budget in the last 4 years:

- 46% is from FR (ANR, FUI, CNRS-PEPS, Investment of the future, etc.);
- 25% from SG (JCO, SERC, NRF);
- 22% from EU (H2020);
- 7% Industry (PSA-SG).

Are visits by high-level visitors from France important to start big projects?

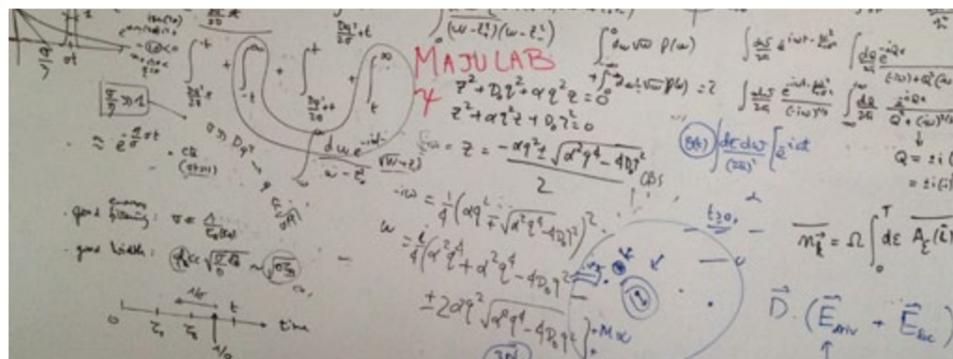
High-level officials coming from CNRS or other institutions make our daily life easier with our hosts. We now are working on a very large project with the Singaporean government, and that somehow results from AUR@SIA 2015. As well, when French President François Hollande visited Singapore last march, he met with A*STAR chairman and I had the chance to introduce him to our work at UMI IPAL. Prior to that we didn't have access to some grants, which we now can reach. Let's say this visit of the French President unlocked this situation.



Visit of former CNRS president Alain Fuchs to IPAL. Picture from left to right: J. Bellmunt (IPAL PhD student), I. Sadek (IPAL PhD student), A. Doucet (Scientific Delegate International Relations, INS2I), J. Y. Marzin (Director INSIS), A. Fuchs (CNRS President), M. Mokhtari (Director of IPAL)

¹NUS : National University of Singapore

²Mounir is from Institut Mines-Télécom



Writing the walls: a typical MajuLab whiteboard.



UMI MAJULAB France Singapore Quantum Physics and Information Laboratory

FAST FACTS

Date of creation : January 2014

Director : Christian Miniatura direction@majulab.cnrs.fr

Partners : Joint lab : FR : CNRS / Université Nice Sophia Antipolis
Laboratoires : INPHYNI (Institut de Physique de Nice) ex-INLN (Institut Non Linéaire de Nice), LKB (laboratoire Kastler Brossel). / **SG :** NUS: with CQT (Center for Quantum Technologies), NTU: with SPMS (School of Physical and Mathematical Sciences) and CDPT (Centre for Disruptive Photonic Technologies)

People : 34 People : Postdoc: 5 / PhD: 6

Co-publications : 103 (January 2014 – April 2017)

Website : <http://majulab.cnrs.fr/>



Experimental set-up to cool atoms with lasers.



Christian Miniatura



Berthold-Georg ENGLERT



Qihua XIONG

At a glance

The France-Singapore collaboration which led to MajuLab started in 2005. It kicked off with a PICS in 2008 accompanied by the secondment of 3 French researchers at CQT in 2008-2009. A MoU (2009) and a LIA (2010) followed, superseded by the UMI MajuLab (2014 -2017). If approved, the next term of MajuLab will be 2018-2022.

Missions and research themes

Quantum Info, Quantum Computing, Quantum Gases, Quantum & Mesoscopic Transport, Quantum Communication in Space, Trapped Ions, 2D Materials (Graphene) & Surface Science, Complex Soft Matter, Microfluidics, Laser Physics, Optics and Photonics, Meta-Materials & Plasmonics.

Research Axes

Quantum Matter (theory & experience), Quantum Information and Computation, Quantum Computer Science, Quantum Photonics, Chemistry of Materials and Interfaces.

Ongoing Projects

- ANR ALCALINF project (started in 2017)
« Interférométrie à ondes de matière d'alcalino-terreux. »
- C3QT project (under MoE Tier3 evaluation)
« Characterization, Control and Certification of Quantum Technologies. »

“ Opportunity to join a UMI? Don't hesitate, Go! ”

Interview

Christian Miniatura, Director



Former President of CNRS Professor A. Fuchs visits MajuLab and CQT (Nov. 2015).

Abroad, is it easier to manage international and regional relations, and similarly, how to remain in contact with your communities in France?

Our UMI budget is mainly dedicated to missions, invitations and the organization of bilateral scientific events. Thus, we contribute to our partners' visibility and initiate new collaborations, particularly through the Embassy's Merlion program. The UMI also favours the co-supervision of Singaporean students, or cotutelle whenever possible: when Singaporean students work in France, they keep strong links with their French colleagues, and reciprocally.

On the international side, I would like to develop links within the region, for example with the UMI JFLI in Tokyo, and as such, I perceive AUR@SIA and AUR@ positively.

Is French institutional support important?

It is fundamental, and I thank the CNRS, INP and DERC, as well as the University of Nice and the UPMC for 9 years of constant support. The help of the Embassy is also crucial, especially the PHC Merlion initiated by Antoine Mynard in 2006. Finally, I appreciate the supportive relationship we have with the CNRS Office in Singapore.

Christian, ultimately, why should such research be conducted abroad?

To bring new institutional partnerships and international visibility to France and CNRS, to increase and extend our scientific influence, in particular in a region of the world whose weight is increasing more and more. Let me also say that we could not have achieved in France what we have done in Singapore, at least neither on the same scale nor as quickly: Singapore brings us a lot of resources, skills and also alternative ways of working. With a UMI here in Singapore we access varied research funding and infrastructures, as well as different dynamics and approaches. It also favours a cultural enrichment: MajuLab involves many nationalities: French, Singaporean, Chinese, Indian, German, Italian, Polish, English and American...!

The UMI MajuLab was signed in 2014. Is its inception so recent?

Indeed on the paper UMI MajuLab is almost four years old, but actually it is the long-term convergence of a scientific appeal, a political vision and a personal affinity. In the early 2000s, Singapore recruited leading European colleagues whom I knew well. Curious, I visited them in 2005 for 18 months. At CNRS headquarters, Bernard Hébral was keeping an eye on Singapore, where Artur Ekert was hired to help create the CQT, and knew that I was at NUS in 2005, working with Berthold-Georg Englert, the actual deputy director of MajuLab, in connection with Bernard Luciani at the embassy. He encouraged me to structure a collaboration there. From then on, the CNRS showed a constant support: PICS in 2007, MAD in 2008, MoU in 2009, LIA in 2010, and UMI in 2014.

The UMI helped you to shift from a national to an international logic?

In accompanying the CQT creation project, I became aware of quantum technologies. And here in Singapore, in agreement with INP management at the CNRS headquarters, I was able to set up a task force with two other motivated people, Benoît Grémaud and David Wilkowski, and do a fantastic job combining since 2008 our partners' resources and strategies with CNRS collaborative tools!

Any advice to a researcher who can't decide to join a UMI abroad or to stay in France?

I clearly say, «Go, choose the UMI!»

There are some intricacies regarding career progression and later reintegration to France, since we are far away and can easily be left aside... So: «go ahead! But do not forget the career dimension.»

How do you manage the interdisciplinarity of the project, this double axis: quantum physics and quantum information?

When Artur Ekert created the CQT, he wanted partners of excellence. For the “cold atoms” axis, France qualified well, with the groups around Alain Aspect, Claude Cohen-Tannoudji, Serge Haroche, etc. Likewise, the French school in quantum computing is one of the best worldwide, so Artur reached out to Miklos Santha, with whom I work in good concert and have regular and excellent exchanges.



A laser-cooled cloud of Strontium atoms.



Seminar Natures and Cultures in Southeast Asia, Chulalongkorn University, January 2017



UMIFRE IRASEC

Research Institute on Contemporary Southeast Asia

FAST FACTS

Date of creation : UMIFRE22 established in 2001, USR3142 established in 2007

Director : Claire Thi Liên Tran claire.tran.irasec@gmail.com

Partners : Joint lab : **France:** CNRS and French Ministry for Europe and Foreign Affairs, GisAsie, Afrase, Case, Cessma, IAO, IrAsia, Ecole Française d'Extrême Orient, IRD - Université Paris Diderot, Inalco, IEP Paris, Université de Dijon, Université de Lyon, Université de Rennes, Université de Rouen, Université d'Aix Marseille, Instituts français and Alliances françaises in SEA. / **Thailand :** Chulalongkorn University (Institute of Asian Studies (IAS), Center for Social Development Studies (CSDS), Urban Design and Development Center (UDDC)), Thammasat University (Centre for Contemporary Social and Cultural Studies (CCSCS)), Chiang Mai university (Regional Center for Social Science and Sustainable Development (RCSD))

People : Researchers: 6 / PhD: 6

Co-publications : 10 (2016-2017)

Site internet : <http://www.irasec.com/>



Claire Tran

Major research projects

Societies and Environments in Southeast Asia
Religious mobilities in Southeast Asia
Memorial practices and nation building in Southeast Asia
Urban planning and Walking in Southeast Asian cities

Principal events 2016 - 2017

- 1 Annual seminar: Irasec/University Chulalongkorn
- 1 regional workshop with Philippe Descola (Collège de France)
- 3 Co-organizations of international conferences
- 4 Participations in International conferences :
- GisAsie, - AAS Seoul, - ICAS Chiang Mai, - SEASIA, - Bangkok.
- 3 Co-organizations of international conferences
- 5 Book Launches
- 3 funded projects : - AIT (Asian Institute of Technology, Bangkok) ; - France Terre d'Asie ; - USPC/NUS.



Launch of *Indonésie contemporaine* book in Indonesian, Jakarta, March 2017

At a glance

Irasec (Research Institute on Contemporary Southeast Asia) is a French leading research centre dedicated to the study of the Southeast Asian region, based in Bangkok. Irasec engages the humanities and social sciences broadly defined in an interdisciplinary and comparative perspective. The main objective of Irasec is to develop knowledge of the Southeast Asian region and to analyze the contemporary major developments that affect individually and collectively the ASEAN countries - Brunei, Myanmar, Cambodia, Indonesia, Laos, Malaysia, the Philippines, Singapore, Thailand, Vietnam and Timor Leste, as well as the Asean itself. It intends to stimulate research and debate within scholarly circles and enhance public awareness of the region.

Missions and research topics

- Contemporary research projects on Southeast Asia;
- Regional & international cooperation;
- Support to young scholars;
- Scientific publications.

Research Axes

- Political Transitions: political cultures, civil societies, ethnic and religious nationalism;
- Territorial Challenges: maritime and land spaces, natural resources, sustainable cities, land policies;
- Social Dynamics: Law, education, health, women's rights and status, migrations;
- ASEAN: economic perspectives and regional integration;
- Societies and Environments: climatic change.

“ Contemporary challenges in Southeast Asia : the Irasec Expertise ”

Interview

Claire Tran, Director



For how long have you been in charge of Irasec?

I am the director of Irasec since September 2016. Based in Bangkok, created in 2001, Irasec is the youngest Umifre and covers the 11 countries of Southeast Asia.

How fast did you define your strategic directions?

With an 'HCERES review just on my arrival and a context mixing reduced budget and staff, I'm now glad that the evaluation last May went well: the evaluators took into account our particularities, with the necessity to synergize the objectives of CNRS, favouring a roadmap anchored in the local and regional academic landscape and MEAE's own expectations.

Based on your experience, what else precisely could be helpful from CNRS and MEAE?

I feel all new Umifre directors would like if CNRS and MEAE could agree to:

- organize a pre-departure visit to all the interlocutors at CNRS and MEAE involved in the management of the Umifre;
- coordinate better the preparation of visas for researchers assigned to the Umifre;
- share across all Umifre in Asia a support personnel for project-funding proposals.

Was your departure abroad the result of an opportunity, or a career desire?

As an associate professor teaching history of Southeast Asia and an historian on Contemporary Vietnam at the Paris-Diderot University, the time that I could dedicate for field research was limited, so I was particularly interested in working at Irasec. These last years, I have developed collaborations between universities in Southeast Asia and my research unit Cessma² (Paris-Diderot University,



Team Irasec at the launch of *Asie du Sud-Est 2017*, Embassy of France, Bangkok May 2017

ComUE³ USPC). I think it's important to highlight the Southeast Asian region as the crucial crossroads in Asia in terms of cultural and religious diversity and economic and military challenges. The recent appointment of a Southeast Asia specialist at the direction of 'GIS-Asia will contribute to promote the region researches in France.

How to understand local partnerships?

Obviously, we are based in Asia to work with our local partners, and not only to be a «French laboratory in Bangkok». The dynamics of our work is rooted at local and regional levels: in Bangkok with seminars, conferences and workshops co-organised with Chulalongkorn University, Thammasat University, but also Chiang Mai University. In the other countries of the region, our researchers also structure partnerships, nonetheless at the end of their mandate it is often difficult to remotely maintain Irasec's projects.

The editorial activity that has long characterized Irasec has been recently rebalanced with research cooperation with local academics, keeping our focus on a reasonable programme of 5 collective publications, including the yearly and unique synthesis in French *Asie du Sud-Est, bilan, enjeux et perspectives*.

Tell us about the event that Irasec organizes next November in Chiang Mai?

It is a workshop on "Natures and Cultures in Southeast Asia", organized by Irasec in close partnership with the University of Chiang Mai, associating also IRD. The famous anthropologist Philippe Descola (Collège de France, CNRS Gold Medal 2012) will take part in this workshop with other researchers from France and the region, funded by the French embassies in Thailand, Vietnam and Cambodia...

What is Singapore's place in this regional ecosystem?

Irasec has a long-standing collaboration with NUS Press. More recently, when I was still in Paris-Diderot, Irasec was associated with an USPC/NUS research project about religious mobilities. We should also integrate Korea, Japan and Taiwan in the picture, as they invest heavily in research in ASEAN. AUR@SIA may be useful in promoting this panasian dimension.

How does Irasec remain anchored in the French ESR?

We are closely linked through researchers seconded to Irasec from French universities and research institutions as Case⁵, IrAsia⁶, IAO⁷... In France, GIS-Asia and Afrase⁸ (which I presided in the past) are two preferred means of connecting researchers and PhD students. Irasec also intends to develop cooperation with European research institutions.



Irasec booth at ICAS International Conference, Chiang Mai, July 2017

¹HCERES: Haut Conseil de l'Évaluation de la Recherche et de l'Enseignement Supérieur

²CESSMA: Centre d'études en sciences sociales sur les mondes africains, américains et asiatiques (UMR 245)

³ComUE: communautés d'universités et établissements, French entities gathering locally several universities, schools, innovation and research institutions

⁴French Network for Asian Studies

⁵CASE: Centre Asie du Sud-Est, UMR8170

⁶IrAsia: Institut de Recherches Asiatiques, UMR7306

⁷IAO: Institut d'Asie Orientale, UMR5062

⁸Afrase : Association française pour la recherche sur l'Asie du Sud-Est



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UMI MICA Multimedia Information Communication and Applications

FAST FACTS

Date of creation : Established in 2002, became UMI in 2006, renewed 2010 and 2014

Director : Eric Castelli / Eric.Castelli@mica.edu.vn

Partners : Joint lab : France : CNRS / Grenoble INP. **Vietnam :** Hanoi University of Science and Technology (HUST).

Industry : Samsung, Toshiba, SoftBank Telecom, Linagora, Uniiity, FPT, VNPT, KhmerDev, etc.

Other countries : 14 MOUs, Over 150 partners from 31 countries, Founding member of AUR@

People : 90 people / 59 research actors / PhD : 19 / Internships : 31

Co-publications : 259 (from 2015 to 2017)

Website : <http://www.mica.edu.vn/>

At a glance

The International Research Institute MICA is a Franco-Vietnamese research institute under the supervision of the Hanoi University of Science and Technology (HUST), CNRS and Grenoble INP. The MICA Institute is a joint international unit of the CNRS - UMI2954.

MICA is mainly affiliated to InS2I and secondary affiliated to InSIS and InSHS. In 2002, MICA Institute was created under the structure of an international research center. It became an International Research Institute in September 2011. MICA Institute was created to meet the need for the development of information technology in Vietnam.

Missions and research topics

Research and R&D activities include scientific research, technology transfer and advanced training in the field of information processing: speech and image processing for multimodal human-system interaction, computer vision for knowledge extraction, sensor networks and pervasive environments for ubiquitous computing, etc.

Applications: mobile devices, smart building and smart cities, robot companion, endangered languages, IT for biodiversity, IT for heritage preservation, etc.

Research themes

Linguistic & Natural Language Processing, Computer Vision, Ubiquitous Computing, Pervasive Environments, Human-system interaction, Endangered languages

Research Axes

- Speech communication and Natural Language Processing
- Computer vision
- Pervasive spaces and interactions
- Technology transfer & applications



Eric CASTELLI



NGUYEN Viet Son

Major research projects

- Speech processing and natural language processing
 - Viet-Muong Translation project (2017-2019)
 - AuCo «AUDIO COrpus of Vietnamese minority languages» (2009-2020)
 - DoReMiFa «Données des Recherches linguistiques de Michel Ferlus en Asie du sud-est» (2014-2015)
- Computer vision
 - “Geometric scene analysis as a navigational aid to the visually impaired” (2014-2017)
 - “Medicinal Plant Identification and Collaborative Information System” (2015-2017)
 - “Rice seed assessment using advanced image processing techniques and machine vision tool” (2015-2016)
 - “Abnormal event detection of patients using computer vision techniques” (2013-2015)
- Pervasive Spaces and ubiquitous computing
 - “IoT system for public health and safety monitoring with ubiquitous location tracking” (2017-2019)
 - “Flexible antenna and RF device for wireless applications” (2017-2019)
 - SIM-CITIES «Sustainable and Intelligent Mobility for Smart Cities» (2015-2017)
 - “Development of multimodal localization methods in indoor perceptive environments” (2014-2016)
- Multimedia
 - ShootMyMind (2015-2017)

Interview

Eric CASTELLI, Director



UMI MICA is one of the first UMI in Asia; can you briefly describe MICA's evolution since 2002?

MICA is the result of a 20-year cooperation between Grenoble INP and HUST. The draft agreement was signed in 1982. Numerous Vietnamese students have come to Grenoble to take master-degree courses often preceding a PhD. Within this framework, both the Programme de Formation d'Ingénieur d'Excellence au Vietnam (PFIEV) and two master-degrees in computer sciences and in signal processing were launched in 1999. In February 2000, the HUST President wished for Grenoble INP to contribute to the establishment of a laboratory which would be connected to the master-degrees. The CNRS took part in this project. The International research center MICA was created in 2002 under the joint supervision of CNRS, HUST and Grenoble INP.



MICA demos

MICA became the UMI2954 on January, 1st, 2006. The UMI was renewed in 2010 to become, in 2011, a Research Institute, the highest level for a research institution in Vietnam. The UMI was renewed once again in 2014. Its upcoming evaluation is due by January 2018.

Creating MICA was a true challenge, but this bottom-up initiative, based upon both 20 years of dialogue between the partners and an exemplary motivation from the French and Vietnamese scientists, was the best guarantee to success.

Can you describe the interdisciplinarity behind MICA's relationship with INS2I and as well INSHS and INSIS?

Interdisciplinarity was built at different level, beginning with the institutional one. Indeed, MICA is a computer sciences laboratory affiliated to the INS2I but two engineering schools are supervising entities (INSIS).

Secondly, MICA scientific multimedia-centered axes are divided into several research fields: natural languages processing, image processing, and smart environments studies. A common research area is devoted to the human-machine interactions, implying for the human user to be considered at the central node of the system.

Finally, the applications are multidisciplinary: assisting people with disabilities, studying biodiversity in Vietnam, safeguarding the Vietnamese heritage, or developing tools for the optimization of buildings' power consumption, impacting the issue of global warming. MICA scientists also work in the field of digital humanities.

How are your links with the Vietnamese academic and scientific community?

MICA's development was largely eased by a 20-year cooperation between the supervising entities, leading them to mutual trust. In a Vietnam culturally rich from its Confucian philosophy, professors and scientists, considered as erudites, are highly respected. Though, despite this auspicious context, the competition is between France and the other countries cooperating with Vietnam strong.



MICA RF platform

Have you cultivated an international dimension for MICA?

MICA's international dimension has been written in its terms and conditions since its creation. MICA scientists have met this expectation and have worked with more than 150 partners from 31 countries. We now wish for MICA to be recognized as a quality partner in Vietnam, but also in Asia. Its position as a founding member of the AURA consortium goes along the idea to place it at the center of a network of excellent laboratories located in other Asian countries in order to lead joint research projects but also to share their experience and points of view.

The regional context is essential. Since 2016, ASEAN has taken a new dimension with a reinforced dialogue between the 10 countries setting it up. Among them, Vietnam wants to become a driving force. This dynamics opens to new cooperation opportunities with our partners in the region.

The French scientists working abroad have a dual mission: to lead quality research projects and to take part in the French economic and scientific diplomacy. The UMIs should serve as a scientific hub for French researchers who wish to carry out concrete actions in ASEAN countries showing very high development potential.

Are relations with companies important for an UMI?

Just like any other laboratory, a UMI has to develop projects according to the “Research-Innovation-Industrial transfer” triptych. However, in an emerging country, the need to develop applied research is significant.

When MICA was created, there was barely any productive bond with the Vietnamese firms, as they were only devoted to spreading solutions from abroad. With the establishment of major international companies in the field of information technologies, implementing new R&D centers in Vietnam, Vietnamese firms had to develop their own solutions not to lose their market shares. Now, even more companies are asking us to get involved in joint projects.

This booklet was made at the occasion of AUR@SIA 2017. November 2017.
Special thanks to all contributors and GAO Peng (graphic design).

AUR@SIA 2017 was supported by the AXA Research Fund.





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