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Donnons un sens à l'innovation

Interactions

The digital economy

Axelle Lemaire, French Government Minister in charge of the digital economy

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FROM THE PRESIDENT'S DESK

The Sorbonne Universities (SU) cluster, a catalyst for innovative projects. Next steps on the path forward?

This issue of 'Interactions' is devoted essentially to reports on the experience and projects developed within the Sorbonne Universities cluster, UTC being one of its Founder Members.

Whether we refer to the 'Special Days on Tele-Health', organized by the e-Biomed Chair in the framework of the University Institute for Health Engineering (IUIS), or to the global issue of "Transportation and Urban Mobility" for which research scientists working at UTC-GSU (urban system engineering) are involved, via two projects 'Partless' and 'Aim', or again to the PLEMO3D platform which offer the very latest data processing techniques, modelling protocols and building analysis (applied to the Cathedral at Senlis) to the heritage aspects of architectural monument preservation, or, last but not least, to the UTC 'Table Tatin' application that underpins the project to create a Digital Hall, … **we can note that the diversity of the examples serves to demonstrate the richness of the interactions and complementarities** that benefit UTC within the SU cluster, through pluridisciplinary collaborative work with some truly eminent partners. The UTC campus life, with a plethora of interesting, rewarding operations (student contracts, the Imaginarium Festival, the Mare Nostrum project …) constitute a real structuring cement conducive to building up a SU student community.

Beyond this strong commitment of UTC and its highly dynamic participation in the projects today, we now face the question of the path UTC will follow in the recent academic construction called COMUE (community of universities and establishments) and hence of the position reserved for Technology and Engineering Sciences within SU, with respect to the specialty fields (Sciences, Social Sciences and Humanities, Management …), organized and proposed by the other Founder Members.
This is an issue that calls for a consolidation of UTC's strategic policy stance and an appropriate vision of our University's future. ■

Professor Alain Storck
President and Vice-Chancellor, UTC

Inauguration of the UTC Computer Science Centre

In the context of the launching of the Robotex Project at the UTC Heudiasyc Laboratory, the university authorities inaugurated the new UTC Computer Science Centre, with some noteworthy and prominent guests present for the occasion, viz., Michel Bidoit, Executive Director of the INS2I Institute of the CNRS, René Anger, Director of the Privy Council of the President of the Picardie Regional Council, Ms Valérie Cabuil, top regional education authority, accompanied by several front-line industrialists such as Renault, Citroen-PSA, EDF ■

http://webtv.utc.fr > Inauguration du bâtiment du Génie Informatique

The launch workshops for Robotex Compiègne and the special "TECH DAYS"

These workshops, organized by the Robotex network brought together the engineers and technicians who manage and operate all the robot development and experimentation platforms in France. They met up at the UTC Innovation Centre, 8-9 July 2015. ■

http://webtv.utc.fr > Table ronde «Systèmes robotiques autonomes pour la mobilité»

Three UTC graduates as laureates of the I-Lab Competition

Three UTC graduates, Matthieu Herman, Adrien Wartel and Baptiste Derongs, were declared laureates in the results of the I-Lab competition for their start-up 'Pipplet', which offers an on line innovative English language skills test. ■

www.pipplet.com

UTC laureate among the 2015 ARCES 'Comm and PR'awards

UTC was awarded First prize on the occasion of the 30th anniversary ceremony for ARCES, June 4, 2015 at the Sorbonne, Paris, in the category "Digital Communication" for its 'My UTC' app. which allows UTC students to receive their exam results individually via a push protocol and to follow UTC latest technology articles, news, videos and campus events in two languages (French and English). In the category "best editorial work" UTC was also awarded a prize for its comic strip history sequence "Somewhere in the Future". ■

http://interactions.utc.fr/hors-serie

UTC App and MY UTC can be downloaded at

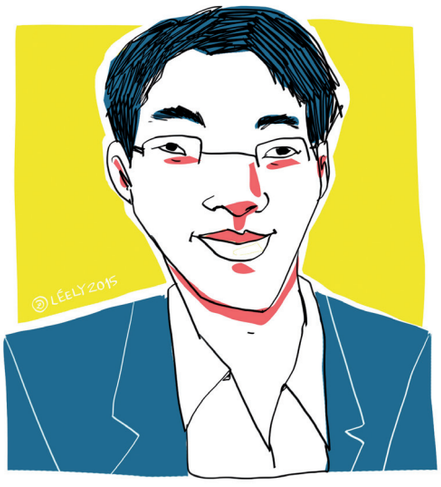
Available on the iPhone App Store

ANDROID APP ON Google play

2015 THESIS PRIZES

" Life-changing theses "

The ceremonies for the 10th edition of the annual "Guy Deniélou Thesis Prize" took place at the university, April 190, 2015 and awards were made for Philippe Xu's research (the Picardie Regional Authority's Prize) and for Tony Dinis (the ARC Prize). P. Xu spent three years in research, between the University of Beijing and UTC to finalize his thesis under the co-supervision of Professors Thierry Denoeux and Franck Davoinen, UTC Heudiasyc Lab. The title of the thesis was *"Information blending as an aid to understanding video scenes"* offers a wide-scope, evolving framework that can model, for instance, how a driverless car 'sees' the world and the surrounding objects. The second thesis benefited from a partnership between the UTC BMBI research Lab (biomechanics and bioengineering) and the Department of Biomedical Engineering of Tufts University (near Boston) for a thesis entitled "Artificial nerve prosthetics using silk fibre to repair and help regenerate peripheral nerve connections" co-directed by Professors Christophe Egles and Fréderic Marin.



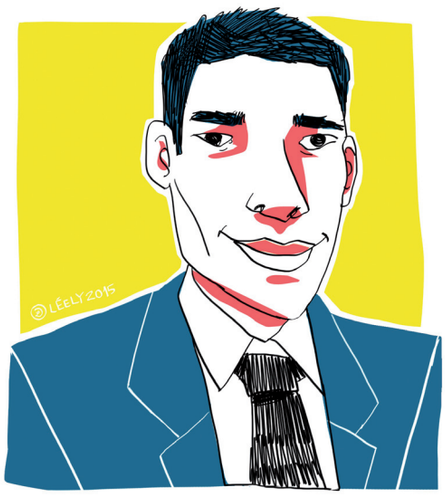
Philippe; we've been hearing about driverless cars for a few years now. What are the main difficulties that hold back their development?

Philippe XU - A human driver, normally, does not experience any difficulty to distinguish a letter box from a pedestrian. But this is a real problem for a computer-controlled vehicle. All the more acutely when other vehicles re on the road, and roadside equipment and even buildings, as well as many other forms of "obstacles". In an urban setting, the main difficulty lies is the capacity for the vehicle to distinguish and identify the various objects composing its 'scene' and to make appropriate deductions. My research led to my proposing a framework for the video analysis and for a subsequent understanding of various road scenes. What is does is to integrate different forms of sensor in a single tool (lasers, cameras, radars …), and different modules that can process the incoming data and provide for a homogenous frame to represent the data, whatever the source. This frame then builds up a virtual scene and organized the objects as identified by the sensors and algorithms, in compliance with a set of on-board, grammatical rules. To illustrate, suppose we have *"a cyclist on the right side of the road, in front of the pedestrian, the latter on the edge of the pavement"* is a proposal for a coherent scene descriptor. In contrast, if we say that *"the cyclist is above the road, in the middle of the sky"* the object in fact might be a nearby aircraft. The sensors provide data that help correct errors when it comes to interpretation, with the objective to come up finally with a coherent scene description.

What do you see as the strong assets of your tool described in the thesis and what are its most significant features?

The fact that you can represent in a single 'space' data coming from a range of sensors allows you, firstly, to have an evolving tool. New sensors can be added on, or there may be new ways to process the data, or again there may be new objects in the scene. Modularity and flexibility together constitute a strong feature of the tool. Not only can the tool adapt and evolve as and when innovations in detection systems arrive, but also it can integrate all sorts of novelties in terms of the interactions between the vehicle and its environment or between vehicles. Today we see lots of networking connected objects and no doubt the future will see vehicles that can communicate among themselves, or interact with road signs and other infrastructures. The system I am proposing does not, for the time being, allow you to integrate vehicles signalling their positions, or data coming from a pedestrian crossing, but nonetheless the design is sufficiently 'open' to

envisage adapting someday to a context like these. In order to successfully complete my work, I had to investigate lots of research papers produced by various teams on a global scale and to integrate those findings I thought most appropriate to my own work. The time I spent in meeting colleagues was every bit as important as the hours I spent in the lab, in terms of a learning process to become a research scientist. The automobile company Peugeot offer me some test-cars on a loan basis and ensured an advisory role for my research. The two years I spent at the University of Beijing also helped enlarge my vision as to how to approach sciences and to convince me that learning how to do research is a scientific affair and equally so an opening to the diversity of today's world of research and innovation.



Your thesis, Tony, presents a new type of nerve prosthetic. What are the challenges here?

Tony DINIS - My research relates to a new type of prosthetic designed to repair and help regenerate serious damaged nerves in the peripheral nerve system; these are the nerves that ensure sensitivity and motricity control between the spinal cord and the limbs. Damage here typically is the result of an accident, for example road accident collisions. The limb concerned loses its sensitivity and the control function, occasionally to the point that the limb becomes totally paralyzed. The only way till now to care for this sort of trauma is to graft a nerve taken from another zone with the same characteristics. Operations such as these cannot always be performed given the risk of collateral damage where the substitute nerve is removed, and they imply several major surgical acts with an estimated recovery rate of 80%. The techniques developed in my research work present a lower level of risk and less unwanted side-effects and hopefully will allow for a better full recovery ratio. The biomaterials I propose do not carry any risk of reject as is the case with grafts from compatible donors.

Tell us a bit more about this technique you are working on?

What we have is a nerve prosthetic comprising a bioactivated silk tube that call for use of molecules selected for their capacity to help regenerate nerve cells. The prosthetic device replaced the damaged nerve and is connected electrically at both ends. The porous tube, with its aligned silk nanofibers, is close in its constitution to real life physiological nerves and this helps regeneration and 'growth and placement' for the new nerve cells. This bioactivation enables full development for the neurons that were 'lost' or damaged. In the space of 3 to 4 years, the artefact graft is absorbed, disappears with a trace and the new nerve takes over completely. Silk is a biomaterial that comes from the cocoons of the *bombyx mori* silkmoth. It is already used for various other tissue engineering interventions, but this way of making it 'functional' and reshaped to copy human nerve cell structures is one of the main striking features of my work. Preclinical tests with rats have led to some encouraging results and present recover rates higher than can be obtained by nerve autotransplants. The research will necessarily continue before practitioners envisage using the technique on human patients. ■

plus d'infos

http://webtv.utc.fr/recherche : Prix de thèse 2015

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ACADEMIC CHAIR

E-health and connected objects

May 27-28, 2015 at UTC, JETSAN held their 5th edition of their 'special days' conference. The event provided an opportunity for research workers, medical practitioners and institutional representatives to meet and update their knowledge base on the latest technologies designed to improve life-styles for senior and/or handicapped citizens.

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Over the two day conference, there were presentations of new tools and research topics but also talks given by health practitioners and patients. The state-of-the-art in terms of recent technologies and also the assessments for various solutions with respect to the needs and life styles were among the subjects addressed. *"The JETSAN conference is both a scientific seminar and a moment to reflect on health issues"*, says Dan Istrate, head of the-Biomed Chair at UTC, who was this year's conference organizer. The theme chosen for the 2015 edition was "connected objects" that represent a possible route to autonomy for a large number of dependent or handicapped persons. "Senior citizens are often at the heart of e-health issues, but we also wanted to discuss the case of handicapped persons, going beyond categorical boundaries", adds the e-health expert.

JETSAN 2015 covered continuous monitoring of vital parameters, support in rehabilitation programmes at home or detection of stressful situations but also aids for leisure activities and day-to-day life and serves as a show-case for numerous applications of connected objects to serve the aim of patient autonomy. Dr Didier Pradon, a practitioner at the Raymond Poincaré teaching hospital (CHU), at Garches (Paris region) spoke about the results he has registered via his study of the use made of connected objects for brain damage patients.

> A state-of-the-art resume for today's technological challenges, an assessment of the relevance of certain solutions, in terms of the patients' needs and lifestyles; these are just some of the points covered in the conference.

Several research scientists from the UTC-BMBI Lab (Bio-mechanics and Bio-engineering) received awards for their presentation of a 3D system that gives an excellent representation of the human skeleton and muscles that offers some novel approaches to rehabilitation. Several other speakers insisted on the importance of having a co-design process that includes the users to propose solutions adapted to their specific problems. Several presentations focused on real-life experiments.

JETSAN 2015 also focused on accessibility, presenting several new interfaces. The audience

UTC-COSTECH Conference on "Young researchers in cognition sciences"

June 3-5, 205, the UTC-COSTECH Lab organized its 9th edition of the "Young researchers in cognition sciences". The objectives were to promote cognitive sciences to learn about and encourage colleagues' work, to encourage also meeting of young scientists and interdisciplinary exchanges in this field.. ■

https://webtv.utc.fr > Enseigner l'écriture collaborative dans le secondaire

Two UTC undergrads laureates of the Pépite [Nugget] Prize

Antony Rouhban and Nicolas Latorre were declared laureates of the 'Pepite' [Nugget] Prize awarded by the UTC Tremplin for Entrepreneurship Association for their Biofeedback Postural Project (pre-certified by the UTC Innovation Centre in Sept. 2014). Their product is a connected object designed to signal an inappropriate body position, in order to limit the negative impact of sedentary work and to help reduce muscular-skeleton disorders. ■

listened with keen interest two presentations by PhD students at Telecom SudParis related to the possibilities to use voice recognition notably to improve man-machine communication (robots or kits adapted to cognitive ailments). The challenge here is quite considerable. The system (named Vassist) which allows patents to voice-control a TV set, a computer or a Smartphone. It was developed by the Institut Telecom, associate industrialists and several European engineering school, was one of the tools presented.

This rendezvous was also a forum for exchanges and reflexions *"We were invited to jointly design the technologies we incorporated (and not deal with them separately) for handicapped persons and senior citizens"*, adds Professor Jerôme Boudy, research scientist at Telecom SudParis who attended the conference. "Several cases we heard allowed us to understand concretely how these patients life outside our laboratories », adds the specialist for fall-detectors and autonomy. As he sees it, the level of connectivity of digital tools enables the users to free themselves form their isolation. *"If we develop on-line user communities allows us to adapt and upgrade existing solutions and to disseminate innovations the same way s open source software"*, he concludes.

"There were many solutions developed in laboratory settings but none was finalized industrially and sold at affordable prices", explains his colleague Olivier Meulle (Telecom SudParis) who worked on the man-machine interfaces. *"Tele-medicine and monitoring systems are well-suited to emergencies but we must also be able to allow handicapped persons to enjoy leisure activities and to feel free"*, concludes Olivier, who addressed the JERTSAN audience not only in his capacity as a research scientist but also as a user, suffering himself from a motricity disorder. ■

http://webtv.utc.fr > A la une > 5ème édition des jounées d'étude sur la Télésanté :

http://interactions.utc.fr > Actualités > E-Biomed : une nouvelle chaire pour les objets biomédicaux connectés

EUROPEAN PROJECTS

'Quieter' helicopter engines

Can we reduce helicopter engine exhaust noise? This was the challenge successfully met by the European Hexenor Consortium (Helicopter EXhaust Engine NOise Reduction technologies). This research project was coordinated by Professor Jean-Michel Ville, UTC, chair of acoustics and industrial vibration); an excellent example of technical and scientific co-operation in the framework of the European Commission programme 'Cleansky.'

Hexenor, co-financed more than 50% by the European Union funds under the EC Cleansky programme, is a part of the Turbomeca Aerospace Group. The call for projects aimed at developing noise abatement technologies, and more specifically, in the aeronautical sector – dividing perceived noise level by a factor two was the objective targeted by the Advisory Council for Aeronautics Research in Europe (ACARE). ACARE is a private-public co-operation among European industrialists – notably Airbus and the SAFRAN Group in France – who proposed technological research topics that could be investigated by academic research institutions.

UTC already had good experience in aeronautical acoustics – numerous partnership agreements with SAFRAN to reduce jet engine noise and successfully met the prerequisites of the proposed contract specification established by Turbomeca. The technical objective was to design and prototype efficient, light and less expensive exhaust muffler units for helicopter turbine engines. *"Our research role"*, says Jean-Michel Ville *"usually consists of producing design tools (theoretical models an d associate test protocols), for the aeronautical, automobile and railroad sectors; with the Hexenor project we were entrusted with the design and assembly of prototype exhaust muffler units ready to be installed on the demonstrator rigs"*. Thanks to two years of 'live' experimentation ad research, the Compiegne team were able to develop and finalize anew muffler design that called for the addition of a perforated plate and extra exhaust cavities that effectively attenuated a wide frequency band of the ambient engine noise. Three mufflers with varying lengths based on the new model will soon (early 2016) be tested by Turbomeca.

Under the overall UTC supervision, this research programme also called for the mobilization of numerous industrial skills and know-how throughout Europe. In order to provide materials that could not only resist the turbine outlet temperature (around 600°c) and the additional constraints due to high speed air flow (> 300 km/h), but also prove light and economical, the enterprises from three different countries were approached. The French engineers at Aperam – an ex subsidiary of Arcelor-Mittal based in the Nord-Pas-de-Calais Region produced the stainless steel component parts. German engineers at GFE and FormTech machined and shaped the titanium alloy plates. The mechanical engineering design work was handled by Rumanians at Comoti.

"The engineering contents of the project represented a non-negligible work-load with the financial and legal departments of UTC, for a contract of over 1.06 Meuros. Out of the 660 k€ distributed to the project partners, UTC received 338k€ for its two year research contributions. This sum was used to cover costs of tests, missions and part-salaries for the University personnel involved – 4 in all – plus the costs for a post-doc research scientist for a period of one year. The Picardie Region supported this project by financing a post-doc research scientist for two years and the Sorbonne Universities cluster also contributed with financial support for the "Europe Unit". ■

The 'Sorbonne Universities' Dossier

The Sorbonne Universities

(SU) cluster and interdisciplinarity

Policies aimed at bringing universities closer together have always been (and still are) sensitive political issues. Ascertaining the position and weight of UTC in a COMUE* alongside two major French Universities (Paris 4 (Sorbonne) and University of Paris 6 (Pierre & Marie Curie, or UPMC) has been no simple matter. Among the issues is the place for technology in a world of traditional 'pure' science. Another is the pedagogical contribution of the arts and humanities that have been an integral factor for UTC, in both teaching and research since the beginning.

-*COMUE - community of universities and establishments

The two large universities focus largely on the mastery of research work and the teaching of natural sciences and humanities, and saw technology as one of the consequences of pure science. To illustrate this point, we observed that UPMC proposed engineering courses but technology was seen as a consequence of its statutory obligations as a scientific establishment. For UTC, technology is a science, the science of techniques, processes … Investigating hard facts and implementing technical processes is a full-scale science, and in contradistinction to so-called natural sciences focuses not so much on what "is" but more on what man can assemble, build … without losing from sight that they go both necessarily hand in hand and rely on each other.

Notwithstanding, the difference noted above is not an opposition, but it allows us to make a rewarding combination of complementarities. UTC talks a global view of technology and thus takes into its stride the contributions of social sciences and humanities, thereby opening up a new landscape between Paris 4 (Sorbonne) and Paris 6 (UPMC) and acts as a sort of 'missing link'. For example, in the field of health engineering, UTC has integrated both scientific and technological innovations in terms of the equipment acquired, and also the human (patient) aspects. Given that the prime objective of the Sorbonne Universities Cluster is to build up a community to open up new opportunities for launching new research topics, this form of complementarity opens the way for research scientists to set up partnerships with colleagues who otherwise (i.e., outside the COMUE framework) would have been difficult to access.

To date, multiple efforts have been made to identify potential partners in the COMUE and to establish project agreements to help build the COMUE further. This phase is now mature and the Cluster is at a crossroads. UTC has the intention to enhance and bolster the vision of technology and to integrate it in an 'excellence' certified ensemble that will gain in international recognition and notoriety, an aim for which the policy coherence is patent and potentially attractive, as we said above. One of the challenges consists of going beyond a simplified project logic to make good use of the 'open' features and structural assets that the COMUE can offer. Various Chairs and Institutes that have been instated recently mobilize strongly anchored research programmes where the benefits have exceeded the expectations in terms financial support and the intrinsic 'opportunity' of the projects. UTC has found a rewarding position in this new and dynamic framework and has become invested in health, heritage, humanities, musicology, environment and ecology, which are all themes carried by the five new Sorbonne Universities (SU) institutes. Via SU, UTC has been in a position to set up common campus operations and shared pedagogical innovations. We believe that beyond the 'ordinary' and traditionally complex relationships, sometimes stereotyped, arts, humanities and the sciences and technology, can all progress together within the Sorbonne Universities Cluster. ■

RESEARCH

Modelling cathedrals: between science art the history of art

If the producer of Pixar comic films called in experts in fluid mechanics to model the swamp mud-baths of Shrek the ogre, then why should cultural heritage experts not do likewise … for a cathedral? This is the objective of the PLEMO3D platform for the modelling of heritage services, i.e., making an offer that uses the very latest digitization techniques, to model and analyse building structures.

"This 3D modelling platform has a more ambitious objective than just making digital 3D representations of architectural structures, archaeological remains, history of art assignments, cultural heritage or urbanism" underscores Eduard Antaluca, The platform is integrated among the transverse structure activities of the Sorbonne Universities Cluster and brings together research teams working with a set of tools such as 3D optical, digital microscopes, large-dimension mobile scan units that enable scientists to produce a digital scan of a complete building. The UTC research scientists are focused today on using the laser equipment to modelise buildings and to derive digital mock-ups.

Cap sur la cathédrale de Senlis

The Cathedral Notre Dame, Senlis was the first building to benefit from a modelling research programme. Notre Dame is a master-piece of Gothic architecture from the 12th and 13th Centuries and was the object of intense attention by scientists from the UTC Roberval and Avenues-GSU (urban systems) Labs as well as that of colleagues at the André Chastel Centre, a mixed Sorbonne CNRS research team. The Modefsenlis programme is part of the Sorbonne Universities Convergence programme "Science and cultural heritage". *"The project allowed us to make a first digital mock-up of the cathedral's 78m high spire and to ascertain a first set of mechanical behavioural results for this structure"*, declares Jean-Louis Batoz, UTC Project leader.

"There were some sixty measurement points installed for several days' work each, as needed to gather the data to model the 3D digital image of the spire", explains Eduard Antaluca. But this modelling work did not end with a cloud of points enabling an inert picture to be constructed. *"What we needed was to understand the choices the masons made when they built the spire so as to deduce information providing for a better mechanical description of the structure"*, underlines Alain Rassineux, a specialist of geometric and digital modelling at the UTC-Roberval Lab. At this and with our desire to understand the aims and choices of the 13th Century architects, help really was needed from an art historian with interest for architectural heritage.

Understanding the building

The Modefsenlis project then invited a PhD student in art history, Mathieu Lejeune, whose constant advice enabled the research teams to select the most relevant hypotheses at each stage. *"Making a digital mock-up implied that we had a precise knowledge about the way Gothic period buildings were in fact built"* explains Alain Rassineux, adding that one must also know the mechanical, thermal properties of the materials used, their nature and other parameters in order to model the structural behaviour of the spire when undergoing the strains of its weight and external climate forces. The finalized digital object therefore is more than just a static mock-up, to the extent that it integrates numerous functional and dynamic constraints; the result is a tool that can be used to continue dynamic spire simulations. For example, *"it could be used to understand why some cathedrals from the same historic period, an example being the Cathedral a Beauvais, have deteriorated, or to better understand how ten structures evolve as time goes by"*,

explains Alain Rassineux. In the way a historic account was needed to understand the period and its architectural practice, in order to make the digital model, the latter will now become a source of knowledge for historians who want to carry out simulations to verify or refute their hypotheses. The spire model for the Cathedral Notre Dame, Senlis remains as the flagship work of UTC in the "Science and cultural heritage" programme and serves to support the development planned for PLEM3D, the UTC GSU (urban system engineering) laboratory also benefited for this success to open a project workshop. In close liaison with the *Société d'histoire et d'archéologie de Senlis* and the André Chastel Centre hosted by the University Paris 4 -Sorbonne, a group of 20 UTC students were invited to spend one day per week, over a three month period to build a 3D model of the city of Senlis … in the 13th Century! This student work was done in less detail than the analysis of the Senlis Cathedral spire but confirms the vision upheld by Eduard Antaluca for the PLEMO3D programme: "to offer a modelling platform capable of implementing and completing projects that run from raw data collection to heritage management". Several complementary, interdisciplinary research topics are being pursued currently by the Sorbonne Universities Chairs. ■

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www.sorbonne-universites.fr > Nos lettres > Lettre n°6.

RESEARCH

Transportation and urban mobility:

is it worth scientific and pedagogical studies?

Questions related to transportation are key to studies on urban environments and life-style, not forgetting city pollution, traffic jams and ill-served areas. The research scientists at UTC-GSU (urban system engineering) and, in particular, the Avenues team are looking at the issues from a global point of view in the PARTLESS and AIM projects developed respectively in the framework of the Convergence and Innovative Training programme supervised by the Sorbonne Universities Cluster COMUE (community of universities and establishments).

Modelling fine particle emissions

The first project, PARTLESS, modelises, from particle sources to the sanitary consequences, the fine particle pollution of the air in an urban context, including impact on our health. In order to integrate the complete chain, from emission to impacts, the project brings together experts in combustion engines and fuels (UPMC - University Paris 6- Pierre & Marie Curie). Other scientists are interested by questions of transportation in urban areas (UTC-GSU) with colleagues investigating the consequences on health of inhaling fin particles. The PARTLESS project started in 2014 and ended in August 2015 set up a research framework round a main route inside Paris where analyses and modelling of traffic generated fine particle emissions. The research model brings in several parameters in order to test various situations. For example, it is possible to introduce differing fuel compositions, road traffic control and urban architecture to take note of the impacts on particle concentration levels and on our health.

The Brazilian experiment

"The prototype was tested with various scenarios and gave some interesting results", underlines Gilles Morel, who initiated the project at UTC. This research scientist nonetheless detailed that the fine particles emitted by industry were not taken into account on a large scale and could alter the models substantially: *"another interesting prospect lies in comparing this model with non-European situations"*, explains Gilles Morel who is envisaging to register a future research phase in the framework of an agreement with the University of Rio de Janeiro, Brazil. Relationships have already been set up with Brazilian scientists in the framework if the project 'Sorbonne Universities Globo Atlantico', covering research and training around global change themes and potential impact in the South Atlantic regions. *"It would prove interesting to introduce PARTLESS urban and transportation components in this programme"*, explains Gilles Morel, adding that the results will normally be presented during the Globo Atlantico school in the Rio de Janeiro area.

Franco-Brazilian Workshops

Another project that involves Brazil and the Sorbonne Universities Cluster is the Innovation Workshop for Metropolitan areas (AIM). The UTC-GSU Department overviews the AIM project in a partnership with the University Paris 4-Sorbonne and UPMC. This is an international scale operation that calls for a pluridisciplinary approach to transportation and mobility thematics. The students involved are spread over two pilot sites, one in Paris and the other in Rio de Janeiro and the workshops will focus on concrete urban situations proposed by the contractors. The project is being prepared today and should start in 2016.

The work covers pluridisciplinary aspects, a mix of research, pedagogy and project management and also aims at building up a network of experts (both public and private) and to promote the use of collaborative platforms for the project management. The Sorbonne Universities Cluster framework represents the 'minimum' link in order to unite research scientists, students and contractors, in a pluridisciplinary, multi-country set-up. ■

plus d'infos **More about the UTC-GSU Avenues team: www.utc.fr/avenues**

www.sorbonne-universites.fr

http://webtv.utc.fr > Infos TV > La voiture de l'avenir

http://webtv.utc.fr > Infos TV > Table ronde «Systèmes robotiques autonomes pour la mobilité»

ON CAMPUS

Engaged citizen students

Building up a real campus life project that involves students who interact with their host city or local area is necessary and important, because universities cannot be reduced to a disconnected system that only produces training and research.

The French University campus model, which began with the creation of the Sorbonne in the 13th Century is still very different from that the main Anglo-Saxon universities. The latter, given their size and associate services, and more recent creation, are true university 'cities in the city'. The concept of the Sorbonne Universities SU COMUE (Community of universities and establishments) is also in the city and surrounding territories and open to opportunities, is desirous to boost its notoriety and development. The idea is to design and propose an environment, a dynamic campus that meets the challenges that not only ensure academic success and scientific excellence, but also to comply with the notions of territorial rooting and an open stance vis-à-vis Society.

"The objective is to consider campus life as one of the 'transforming' features' needed to build a community of universities and establishments (this so-called COMUE-Sorbonne Universities) and to anchor them in a city areas or a region", underlines Frédéric Huglo, Director Delegate UTC. This development is made possible by involving students in the transformation process and in the anchoring role, and can go as far as having them be prime movers of the transformations. Three priorities have been identified, in this context, to develop tomorrow's universities … and the future citizens: student employment, suitably equipped campuses and student commitment to university associations. These policy priorities overlap in some instances and serve to demonstrate that a university can be a truly strong "life-intensive" element in a region, and this is a sense that UTC itself defends, designed as it was as a 'university in the city'.

Jobs that bring life to the campus

Societal debate rages - in a constrained economic and budgetary context - in regard to necessary building (and other financial) programmes concerned to enable any young person to make his/her professional project come true. Universities today are also faced with this issue, i.e., identifying the financial tools that students could access to obtain material conditions that make their academic success and later professional insertion possible. Ass Frédéric Huglo sees it, "it is preferable to privilege student jobs because, over and above the financial support that they bring, they give the students a sense of 'pre-professional' responsibility that will enable them to enter the professional world in better conditions when they graduate. Student jobs also get them better committed to the development of their institution (university …). A very ambitious job procurement policy followed by COMUE, in fact, completes the overall thrust to develop "life areas" for students, such as the Fab'Labs or the open access computer rooms.

> The policy aim is to design and propose a life-style and campus dynamic environment that complies both with the challenges for academic success and scientific excellence, and with the need to see these institutions firmly anchored in their territory whilst being open to Society at large.

With its actions, the SU-COMUE has secured student job openings covering several campuses. Other jobs are accessible to help handicapped students, to improve campus services, such as changing the opening hours of libraries and participating in knowledge dissemination programmes that target the secondary school colleges and lycées in poorer urban areas, for the benefit of the institutions represented in the COMUE.

Developing better life-style areas

When we refer to development of new activities, we are implicitly talking about the life-style areas for the students. SU-COMUE has adopted then policy to promote those areas where students themselves can organize and run events, the idea being that they are accessible for all students in the COMUE; developing student life on this sort of scale allows SU students who live in Compiegne to access UTC facilities, or even to register for a course module at UTC. *"The idea is to install structures that encourage and enhance the emergence of a Sorbonne-Universities Community and sense of "belonging" to it"*, explains Frédéric Huglo, who also underscores the fact he sees as important: to proceed with these installations in close liaison with the establishments involved. For example, the Fab'Labs of UTC and Paris 6- UPMC were designed jointly. Other options have been implemented to offer the premises to organizers of events covered by the COMUE, e.g., making available the rehearsal rooms at UTC for the UTC students musicians who perform in the SU Choir and Orchestra (COSU).

No half-measures or lukewarm projects

Activities? Jobs? The students and their institutions then only need to imagine and implement various activities to see their community come to life in their respective establishments. As far as UTC is concerned, you simply cannot ignore some of the events covered by the SU-COMUE banner.

The music festival *'Imaginarium'*, organized May 23-24, 2014 was attended by nearly 8 000 festival-goers. Two stages saw twenty or so pop rock groups among the best in France, such as The Do, with its duo Olivia Merilahti and Dan Levy. The *Imaginarium'* has – over just two years – found and adopted a lasting style, of national impact an seen as an original event alongside the other major music event the year. Technology at UTC played a special role with a contactless pay system developed by a UTC graduate start-up. And indeed this system has been adopted by other major music events, such as the 'Les Vieilles Charrues' at Carhaix, Brittany.

Another project, code-named *Mare Nostrum*, was a fascinating adventure. It began in 2013, with two students, Louis Wilmotte at UTC and Douglas Couet, at Paris-6 (UPMC) who paddled from Gibraltar to Istanbul in a

sea-kayak.! Their voyage gained them the Poseidon Trophy that is awarded for projects that relate to the sea. The two students carried out a set of scientific observations during their trip, lasting over a year. A real and new dimension was the sensitivity of these two students as they met and exchanged with people in their various ports of call.

Universities necessarily need a territory

While it is obviously important for students to be committed to the development of their university campus, it is also highly important that they become sensitive to "life in the town" and to local citizenship developments. This is embodied in the initiative called "Together for the City". Once every year, two days after start of term, the 'freshmen and women' at UTC devote their day to the needs of the City of Compiegne. The challenges they accept covers things like re-painting the school frescos, installing smoke detectors in senior citizens' (or handicapped persons') homes, or creating community gardens with and for the Compiègne citizens. *"The objective is 'two-in-one"* says Frédéric Huglo. *"On one hand, the programme serves to make the students sensitive to the social, cultural, historic and heritage background of their city and their establishments and, on the other hand, helps anchor the university in the city, in its territory and thereby demonstrates the added social value for local societies living closely together"*.

The underlying idea is to show that student generosity, creativity and commitment is there to help develop the City and enhance community life together.
Local elected officers are very sensitive to this initiative to the extent that it often leads to protects that are 'designed' and discussed jointly with the students and university. The partners here are well aware of the advantages in having a rich and creative student community that can organize artistic, sports, economic and societal events and projects that benefit the territory as a whole. ■

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http://webtv.utc.fr > recherche : Tous Unis pour la Cité - chorégraphie

PEDAGOGY

The BAC project – anticipating *knowledge testing: how is the problem shared?*

How can we test prerequisites to ensure appropriate monitoring of students and organise relevant and adapted pedagogies?

Encourage autonomy

This project, under the code name BAC for Anticipated assessment of knowledge testing, was introduced in the framework of support procedures for the pedagogical research conducted by the Sorbonne Universities cluster (SU) and seeks to answers questions that relate to the effects the reforms of the French Baccalaureate S programme (2013) will have on university students. The BAC project was initiated by UTC, with the aim to have a tool to combat student drop-out in first year and to encourage their autonomy and thereby make them more efficient as they launch or pursue their learning paths. *"To illustrate, if we can pinpoint a shift in level or an overload in work schedule, we can help the students to become aware of this and of the efforts needed to correct the situation"*, says Manuel Majada, Head of the UTC Pedagogical Support Unit. The new approach consists not only of identifying the mastery of certain prerequisites but at the same time to reinforce students' degree of autonomy and teach them how to manage their timetables and efforts.

Different contexts but with a common experience

The University Paris 6 (Pierre & Marie Curie – UPMC), partner to the programme has somewhat different aims and objectives. Given that the UMPC degree courses are far less personalized than at UTC and also the student levels at the start are less homogeneous, UPMC is seeking how to advise each student to enable him/her to better integrate a less modular course structure. *"However, despite the different contexts of both institutions (UMPC and UTC), experience has taught us that we can learn from each other and that a number of specific actions can indeed be shared between both"* underscores Manuel Majada.

Sharing tools …

For example, the first step of the assessment process consists of validating the prerequisites for the mandatory core courses. This is done by questionnaire, most often multiple choice models (MCQs) that can be used by lecturers at both UPMC and UTC. Efforts have been deployed to have homogeneous drafting of the MCQs questions and to offer supports with maximum portability between UPMC and UTC. *"It is also a project that enables the academic staff involved to build new relationships, over and above the common research aims and activities"*, adds Manual Majada.

… that UMPC and UTC can adapt to local needs

To be concrete, the MCQs are lodged on Internet accessible portals that enable several varying parameters to be by used, depending on the logistics available and on the aims of the establishments and teachers. *"The parameters will be different if it is designed to select student applicants or whether it is there to help students find solutions to their difficulties"*, explains Manuel Majada. Thus, it is possible to choose how long the test is, what is the marking system and values per correct answer, or again whether it is run in a classroom or on-line … or other options that relate to logistics of the test. At UTC, the tests are run on-line so that the students have a comfortable time period to work out their possible difficulties before the year starts, whereas UPMC has always preferred to run the tests in the class-room.
Once the tests are completed, those in charge of the assessment report back to the students and to their lecturers. The form of the report of course will be adapted to the local situation, and may lead to a dialogue being set up between students and the academic referral teaching staff. ■

PÉDAGOGY

The UTC Digital Hall, a shared, collaborative work-space

If we are to believe the philosopher Michel Serres, the act of communicating began when *homo sapiens* exchanged round a fire. The very invention of writing took the act out of caves and homes and shifted it onto a support, clay, papyrus, skins, parchment and paper … The printing machines throughout the ages, and then the Internet multiplied no end the trend and today the accepted standard is that we communicate by screen.

«But multiplying the screens means that there is a no place for shared work anymore, even if the communicators are sitting together in the same room", explains Thierry Gidel, a lecturer research scientist at UTC, in charge of the Digital Hall for the Sorbonne-Universities cluster. In order to modify the work place paradigm, Gidel propose that multiple individual screens be replaced by a digital zone for shared, collaborative work. The set-up is constituted by a table and flat tactile screen where each participant can interact with the information displayed on the table, modify it, add other data or organize them with the other participants all present round the table.

From classroom to Post-It®

What initiated this project was the idea to seek ways to improve pedagogical approaches for the elective specialty Project Management and Innovation, a team that Thierry Gidel joined after a career in industry. *"In the beginning, we had to move the table and chairs around, then we brought in boards, screens and used Post-its® to build an environment conducive to collaborative work in a course that focused on learning of design methodology"*, details the researcher Gidel. Rapidly, the idea dawned that all the above accessories should be replaced by a single digitized tool that would centralize the data, the presentations and the means to modify them and the displays.

The end of paper print-outs …

The "table" proposed has functions such as digital Post-its®, image modifiers, graphic processing of data and other tools to aid project management. The first prototype was started at the UTC Innovation Centre in 2007, and was rapidly coupled to a tactile screen fitted to the Table.
Today there is a special room at UTC equipped after work on the TATIN Project, in a partnership with the UTC Innovation Centre and the CUTSC COSRTECJH laboratories at Heudiasyc. The project is supported by the Sorbonne-Universities Cluster (COMUE) and became operational six months ago; the research scientist here are working on development of various table "apps". A new set-up is planned for the next academic year start, and will comprise four different environments with a table, a tactile screen where each arrangement will accommodate up to six students working together.

… but also the end of personal screens

The Digital Hall, designed as a tool to serve academics, is adapted to a project-oriented pedagogy in phase with the needs expressed by the industrialists. It will also serve students, inasmuch as it will gradually equip the entrepreneurial environments. Today our tools are designed to be operated with a single user, whereas the Hall proposes a total change in paradigm offering a collaborative, multi-user working place that bans personal screen usage. *"Various studies have demonstrated a lower level of performance when communicating singly via screen, compare with an interacting screen arrangement"*, underlines Thierry Gidel.

An open training area

This area is specially designed to receive trainees in project management, creativity enhancement, strategic analysis or problem-solving? "What we would like to see is the various specialties here becoming interested in this set-up and that many colleagues will be contacting us to use it", suggests Thierry Gidel. And although the Digital Hall is mostly oriented to management and design training, it could also prove interesting for various others domains as varied as publicity of archaeological research.
Having set up contacts with the Universities of Paris 4 Sorbonne, Paris 6- UPMC and the establishment MNHN (national museum of natural sciences), Thierry Gidel now wishes to develop partnerships with other teams in the SU- Sorbonne Universities cluster (COMUE community of universities and establishments); In order to test the tool in a distant learning framework, Thierry Gidel would like to set up some joint training courses with these other SU institutions. ■

THE IUIS INSTITUTE

The combined strength of the tryptic: hospital practitioners, engineers and research scientists

What, we may ask, is the connection between an expert in signal processing, a specialist in musculo-skeleton disorders and a practitioner in MRI (magnetic resonance imaging) techniques? The answer no doubt lies in some of the 17 projects financially supported by the Institut Universitaire d'Ingénierie en Santé (IUIS) [University Institute for health Engineering] set up in 2004 in the framework of transverse actions decide by the then nascent Sorbonne Universities Cluster. IUIS groups together the Faculties of Medicine and Engineering Science sat the University Paris 6 – Pierre & Marie Curie (UMMC)? The objective assigned to the Institute is to bring hospital practitioners, scientists and engineers closer together when they have the capacity to understand and express their common needs and to identify appropriate tools.

Why would one want to perfuse a liver organ?

Amon the 17 projects selected in June 2015 (out of some 40 proposals), 3 are financially supported by UTC. The first is to explore the feasibility of a liver perfusion machine designed to improve the quality of transplantable graft organs. Effectively, no matter what organ we wish to transplant, the possible graft candidates are rare and it is necessary to preserve them and even improve their functional quality.
The project NormoPerf arose through a demand by a group of surgeons at the Paris Pitié Salpêtrière Hospital. The research programme is managed jointly by Professor Olivier Scatton at the hospital and by Dr. Cécile Legallais, Deputy Director of the UTC-BMBI (biomechanics and bio-engineering) and the scientific reference for IUIS at UTC. The first objective of the project is to validate the feasibility for such an equipment.
"Machines that can perfuse organs made ready for transplantation operations exist already in Europe, offered by some specialist firms", explains Cécile Legallais, although we can note that the unit prices are still high. The NormoPerf project team would like to design a similar equipment in France that could be offered for sale at a reasonable price and correspond as best as possible with the needs expressed by the clinical practitioners who have drafted the unit technical and medical specifications.
A pre-clinical prototype should be tested and made available at the end of this semester, and will provide for a first assessment and hopefully validation of the tool, thereby opening the way to raising funds to pursue the research and prototyping development.

Placing an ergometer in a MRI scanner

A project that places a treadmill, a bike or a home rower in an MRI (magnetic resonance image) unit to study muscle functions for children who have musculo-skeleton disorders such as myopathy is research that has as its aim to design a device to collect information to follow the way the disorders evolve and their treatment. Whereas the first stage consists of eliminating all metal parts from the ergometer to make it compatible with the MRI unit, the bulk of the work is to correctly collect the data and analyse them. "The device automatically and simultaneously transmits the values of the forces measured at the ergometer and the MR images", explains Cécile Legallais. Signal processing then comes to play to analyses the data streams and to deduce medial information that will be used to monitor the young patients through time.

> The framework offered by the SU Cluster increases by a factor 10 the potential to elaborate this sort of project

The project, with its code name DERMYO, is supervised by Sabine Bensamoun, UTC and Dr Christine Themar-Noël at the Pitié-Salpêtrière teaching hospital, offers the UYC research scientists the opportunity to work in a collaboration with practitioners who have a direct contact with the young patients. For the medical staff, the opportunity is to work with and benefit from the techniques of signal processing with specialists who, in contradistinction, do not have the clinical framework in which they could develop such equipment.
The device has already been assembled and tested in the case of adult rehabilitation programmes while use for and with children with genetic pathologies has yet to be launched and explored.

A laboratory for…platelet research

Blood platelets are the essential component for blood coagulation, to the extent that if the concentration is too low there will be a potential risk of haemorrhage for the patients. Platelet transfusion is the only treatment possible today "but numerous attempts have been mad to produce artificial blood, unsuccessfully", explains Cécile Legallais. However, it is possible now to produce platelets in a laboratory environment.
The LaProPui Project, directed by Dr Anne Le Goff, UTC-BMBI (biomechanics and bioengineering) and Dr Isabelle Martin-Toutain, at the Pitié-Salpêtrière hospital consists of establishing a laboratory to produce blood platelets. PLATOD is a start-up associated with this project and has a method but with limited production prospects. The UTC research team are investigating the ways and means needed to render this production method "parallel" and thereby significantly increase the production possibilities. The process depends on use of cells present in the bone marrow where the platelet originate and the specialists envisage using the patients' cells directly to produce then needed platelets.

An academic chair for connected biomedical tools

The e-BioMed Chair is directly integrated to IUIS and has just completed some projects developed at the Institute. The objective is to ensure inter-communication of various existing medical devices into the day-to-day lives of monitored patients. For example, the possibilities offered by tele-medicine also enable senior citizen patients to stay at home, to monitor diabetes patients or women with at risk pregnancies.
A permanent staff member was recruited in September 2014, to manage the chair's activities, implying the integration of medical, signal and data processing equipment and home installed devices. QAs Cécile Legallais sees it, "this sort of project underlines the complementarity that exist between the establishments and institutions that form the Sorbonne Universities Cluster (COMUE)".
Collaboration with the electric equipment and domotics industrialist Legrand is being finalized. The laboratory assembled takes the form of a connected apartment and allows the research teams to study simulated 'home' situations to analyse the patient's movements and activities. Viable solutions certified via this pilot home will then be deployed in other medico-social structures, as found for example in the EHPADs [Medicare Homes for Dependent Senior Citizens].
"The framework offered by the SU Cluster increases by a factor 10 the potential to elaborate this sort of project", feels Cécile Legallais who sees a change of scale in the possibility now to set up research projects. "We have financially supported 6 new projects after the most recent call for proposals".
A conference is planned in November to officially launch the Institute and to demonstrate the advantages that would come from such a structure. There still remains a challenge: to ensure that the system will grow and show its potential to attract more important partnerships, on an industrial, international scale. The Institute entertains the ambition to be able to, assist the setting up of new, large-scale, projects. ■

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Cf. intra page 3 "E-santé et objets connectés"

A new look at
The digital economy

For Ms Axelle Lemaire, Junior Minister for The Digital Economy, reporting to the Minister of the Economy, Industry and Digital Questions, "*When we talk about the digital world and its actors, we often refer to young digital-intensive start-ups who produce hardware, software and associate services. Beyond being a purely technical domain, the digital economy often introduces new business models and totally changes the way we design, produce and distributes goods and services".*

We are moving into a new form of economy in which innovation cycles are shorter, rely on user and/or developer communities and occasionally 'dis-intermediate' or shunt completely certain sectors of the classic economy.

The answer here is that the digital economy is much more than a "sector" and that is why I prefer to talk about a 'digitized economy'. The various economic segments are no longer separate entities and they evolve along with the overall transformation of traditional economics. Smart textiles, connected objects, MOOCs, Web and smart phone applications in medicine, law, finance … there are only a very few sectors now that have not experienced innovative changes because of the digital world.

To what degree does the advent of a digital economy represent a major turning point for the French economy and is higher education particularly of interest here?

A digitized economy is an important turning point inasmuch as we must now live and think with new referrals and attributions: connected trade and business outlets, dematerialized public services, new jobs ... Our objective is to accompany start-ups as they grow and develop, on their way to becoming large(r) business concerns. The prime aim is to include Society as a whole in the trend, without making any differences of age, social backgrounds or territorial differences: the future will be made of everyone's participation and contributions!

> The various economic segments are no longer separate entities and they evolve along with the overall transformation of traditional economics.

Obviously, innovation goes hand in hand with education and research. Our main challenge for the coming years is to be in a position to train more and more people and to do this even better, to improve the competitive position of France in the global economy context: digitization has become an incredible lever to reach out to new audiences, via MOOCs but also provides a way to experiment new forms of apprenticeship, notably in project mode. Our Higher Education must also be prepared to train for new professions, to integrate new pedagogical approaches, to create bridges between the Universities and research areas – like the efforts you are deploying at the Sorbonne Universities Cluster (COMUE), to bring science and technology closer together.

Does France benefit from any advantages here and what is our position in Europe?

Yes, France has advantages, over and above the clichés: our universities are among the best in the world and attract some of very brilliant foreign students; investors and foreign enterprises continue to locate their business here – France ranks 4th for the amount of direct foreign investments; our infrastructures are reliable and efficient as can be observed with our very high data rate fixed networks (2nd in the world). the French count among the most connected nations- 83% use and practice Internet, 400 000 are matriculated for MOOC courses.

Along with Germany, France is a driving force for European digital strategies. We are moving towards a connected European 'single market' which will be a powerful tool for the expansion of our enterprises and, of course, useful for the consolidation of the European Union as the world's first economy power.

What actions in favour of digitization do you see as most strategic and innovative in coming years? And how should we reassure people who are scared of digitization?

This is indeed the objective of the French Government's digital plans, published in June. Thera are 4 priority thrusts: freedom to innovate, equality of rights, fraternity – digital access for all and an exemplary transition of the State services. These axes will comprise the spine of the digital economy draft bill I shall be presenting to Parliament before the end of the year.

In order to innovate freely we must make best use of 'French Tech', the promotion of open innovation, of open access (free access to research papers and publications), free user licenses. It is a way to guarantee and reinforce citizens' rights as to the safety of their personal data and/or on line payments; it also reinforces the confidence and transparency through having a truly neutral net context.

And the State authorities must be exemplary. Innovating also means developing dematerialized public services, combining ease of access, and efficiency: the « digital hospital, on line registration of complaints, social service simulations, mesaides.fr. … there are lots of projects in the offing. We should also be looking at the opportunity to do things more easily with a digital tool, such as being easier ways to collect data and this is the ambition of our programme "One stop question portal" or simplified access to administrative services as can already be seen at "France Connect". In a word, we have a splendid chance here to be "more open" in a digitized world. ■

DID YOU KNOW THIS?

110 billion €
The digital fraction of the French GDP, more than in financial service and agriculture.

1,5 M €
Value of jobs dependent on the digital economy in France

+40 %
Potential market turnover gains for a company that proves successful in its digital transformation.

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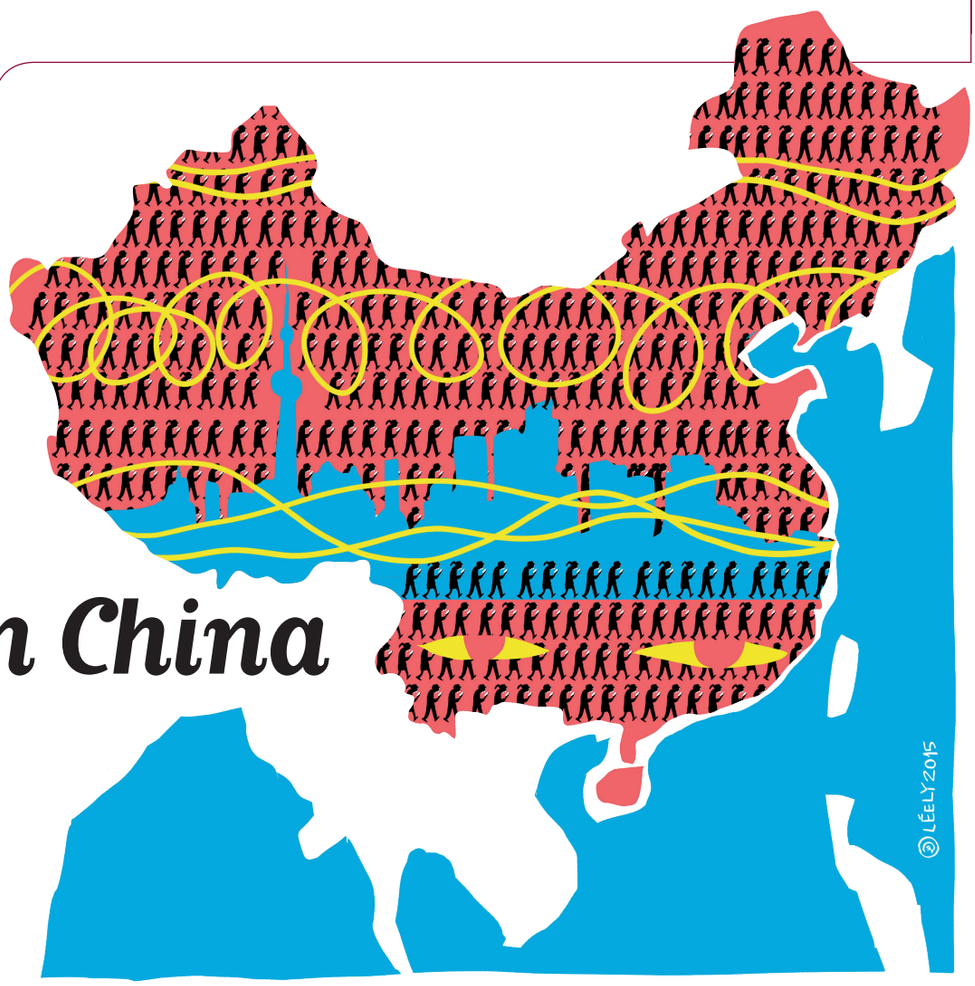
Axelle Lemaire, more at:
www.axellelemaire.eu

WORLD VIEW



The Net in China

Chine today counts 22% of the world's Internet surfers and "locally" designed "apps" and manufactured connected objects are multiplying no end. This "digital boom", however, masks a more complex situation, depending on which geographic zone you consider. Gurvan, Director for the Data Processing Department for a luxury goods company based in Shanghai, his responsibilities covering the Asia-Pacific Region gives us his 'world view' on the state-of-the-art of technologies involved in data processing in China.

Gurvan works and lives in the richest city in China and one which counts among the best connected urban areas in the country. Not a week goes by without our regional manager taking note of the number of workers drawing and laying and installing fibre cables along the streets of this 24 M inhabitant mega-polis.

All day, every day, he observes Chinese people constantly connected for private purposes. *"From a professional point of view, collaborative tools have not yet been integrated in Chinese minds and e-mails are still the rule of the day"* notes our UTC graduate in Artificial Intelligence and Man-Machine relations. Gurvan is astonished by the digital 'conservatism' of the thirty year age bracket of employees in his company.

What he has noticed is the development of completely Chinese innovations after using 'improved' versions of the famous Facebook *(Renren)*, Twitter *(Weibo)* and Google *(Baidu)*. He cites *WeChat*, a special network and chat forum combined as one of the most spectacular – with 1 billion subscribers in just 4 years. A recent report announces that the WeChat users consult their account, on average every 6 minutes! With a level of success such as this on the domestic Chinese market, the programme is now being exported over and beyond the Great Digital Wall. *"Distinct from earlier message systems, there is an on-board translation pack that allows the readers to have their messages sent in English and/or Chinese"* adds Gurvan who is an adept of the Chinese 'Net'. The only drawback for the moment is that publications seen are posted publicly but it is not yet possible to go viral and share massively a post.

When Gurvan analysed the supports used, he discovered that the Smartphone outstrips the PC as the preferential access mode to the Internet, adding that *"Purchasing a PC still lies beyond the financial possibilities of a large fraction of the Chinese population"*. The Chinese smartphone brands – challengers of i-Phones and Galaxy y- such as *Mi* or *Huawei* – have promised that will produce units at twice or three tome less than the price for foreign equivalents. As Gurvan underscores the situation, the democratization is not always respectful of intellectual property rights. On the Chinese equivalent of YouTube, *"Sur Youku"*, and also on a large number of 'streaming' specialist sites, you can find the entire pirated gamut of Western world copyright items – *"because there is no way go buy the original over the Net or in any shop"* says vigorously one of the luxury company employees.

As far as the quality of the connexions is concerned, our computer science specialist does have some misgivings. The Chinese Net seems to be having trouble in absorbing the exploding demand and all Chinese are not equal faced with the Net. *"Using some tests, we noted and analysed the access time to our own sales site, and saw that the times could be different by a factor of two or three, depending on where the request originated"*. The huge coast-lien cities such as Shanghai, Hong Kong or Tian Jin are continue to increase the number local urban subscriber connections but they in fact only represents a fraction of the reality of the Chinese net. In international terms, the quality of Internet links and phone line quality with Europe remains highly variable. *"And despite the encouraging changes we can see with the physical infrastructures, the maturity of the Chinese Net has not yet reached the level of its neighbours Japan and Korea or even Europe"* add Gurvan who has spent the past 4 years in China. *"The two State operators China telecom and China Unicom regularly face problems of net customer connectivity: if you want to consult a site via another supplier this proves difficult"*, he adds. Gurvan then describes how several major foreign groups have been led to building their own internal networks to handle professional data exchanges. In his analysis, Gurvan adds that the flow rate problems seem to be made worse by heavy-handed controls exercised by the Chinese authorities. *"The Chinese Government is aware of the opportunity that a digital economy represents and in all probability things will start to move in the right direction here"*, concluded our graduate in his world view. ■

CROWD-FUNDING

Tester and financing a project via the Internet

kickstarter.com was created in 2009 and since that date has raised 1.8 billion $US; it is one of the leading participative financing platforms, using a technique called "crowdfunding". *Watch-it-Made®* and *SensorWake®* are the code-names for two projects launched via *Kickstarter®* by two UTC students.

'Kickstarter's notoriety and the fact that the system proposed a way to finance product convinced us", says Florian Caroff, a UTC graduate who initially designed the Watch-it-Made® educational project based on a watch-making scheme in schools, conducted with the University of Cranfield, UK, where he gained a Master's degree. With 6 years' experience, 86 507 projects and 8.8 M contributors, *Kickstarter®* hosts a very wide range of products, running from comics trips, film-making, setting up an artisan company, implementing pedagogical actions or new "high-tech" products. No particular selection, *a priori*, is made for proposals in terms of quality or contents, with one exception 'humanitarian' activities for which there are specialist sites.

The funds collected run from several tens to hundreds of thousands of euros. *Watch-it-Made®* needs to secure 18 000 euros in order to make a wholesale purchase of the parts needed to assemble 400 watches. With the parts, the school children assemble the watches, enabling the donators to wear an original watch creation. *"This form of participative financing is different from equity crowdfunding – represented by the British site: www.crowdcube.com - which proposes shares in exchange for donations"*, says Florian who graduated from UTC in 2014. This "citizen shareholding" is more reassuring than applying to an investment fund or private investors who can prove somewhat 'greedy' with an easier access than to bank loans or state financed incentives and it enables the candidates to raise much more money than via donations for products.

Kickstarter® operates on a "go-no-go" mode. If the fund training campaign does not reach the targeted sum, no money is due by the donators. If the campaign is a success, then Kickstarter® receives 5% of the total donations. *"This allowed us to check if the market place was mature and to launch the commercial project only when the funds were made available"*, explains Guillaume Rolland, co-founder of the SensorWake® scent alarm clock. *"In order to succeed, you need to run a "PR" campaign way ahead (5 to 6 months) of the product launch. The base of e-mails we received at www.Sensorwake.com represents a 'faithful' community of some 10 000 persons who have expressed an interest even before we approached Kickstarter®"*, says our young entrepreneur who was advised by well-experienced 'crowd funders'."

As Guillaume sees it, the second stage was important and consisted of producing excellent graphics and presentation video. *"The story-telling part of the product, its presentation and the accompanying script were every bit as important as the product itself"*. Making the information circulate is also important. *"Marketing via the social networks and in the family and friend circles, plus good echoes in the media all count enormously"*, concludes our UTC first year student engineer, who is about to make an authorized one-year break in the framework of UTC's "entrepreneurship elite" programme. ■

plus d'infos **http://webtv.utc.fr > recherche > France 3 - Guillaume Rolland, le génie de l'invention**

http://sensorwake.com/

AT THE UTC DANIEL THOMAS INNOVATION CENTRE

Le start-up Week end
Compiègne au Centre d'Innovation

Sharing photos "live" with your friends, finding all you want to know about a City in a single "app", etc. These are just two of the projects that emerged during the Start-Up Weekend, Compiegne –that took place May 15-17, 2015 at the UTC Daniel Thomas Innovation Centre.

The concept of a Start-up Weekend initially came from the USA and was organized by the UTC students for the first time last year. The objective for the weekend is to set up a start-up in just 54h by collaborative team work. "*We want to develop the start-up spirit in the Picardie Region, and enable everyone to exchange ideas and identify possible associates"*, explains Cédric Carvahlo, a member of the organizing tam. The UTC Innovation Centre seemed an ideal venue for this sort of event, thanks notably to its "creativity rooms", Ninon Durivault, co-organizer confirms: "*The UTC Innovation Centre is indeed the ideal place to host an event like this. The project platform on which the participants work has its tables and mobile walls so that the can organize the work space as they wish. Moreover, the number of surfaces available allow the participants to write on the walls, to stick up Post-its® and express all their potential creativity"*.

This second edition saw 60 participants came to Compiegne, one third with no connections with UTC. *"The truth is, we decided to participate in the Start-up Weekend to finalize a project among a bunch of friends"* says Jérôme Durand, UTC student, for whom this was his first participation.

These participants (students, lecturers, research staff, "creatives", company mangers …) may or may not have an idea in mind when they arrive, as was the case of Fabrice Faradèche, manager of the *Blanchisserie Centrale [a chain of professional cleaners]* in the city of Soissons and President of the Picardie Entrepreneurs' Network, who wanted to find a way to 'mark', *i.e.*, follow clothes from residents in retirement homes. In every case, *"the participants had just 60 seconds to present their idea(s) and trigger an interest in the audience so as to be able to put a team together"*, explains Nicolas Borri, co-organiser.

Out of 23 ideas presented in this manner, 12 were pre-selected for the next step.

What is specific to this kind of event is that there is a rich mix of profiles in the teams. *"Given that the participants come from different UTC specialties (GSU-urban engineering, GI-Computer sciences, GM-Mechanical engineering, Master's in Design course and IUT students in computer sciences and software engineering), the transverse aspects of the projects was seen as highly attractive"*, says Jérôme Durand.

The selected participants then have exactly 54 h to specify their initial idea better, to produce and present a business plan and then make a prototype at the UTC Fab'Lab … all of which provides for an intense and very rewarding experience, as witnesses Jihane LFRIDI, a member of the PicatchUS team: *"Firstly, we wanted to create a conducive organization spirit, that would enable us to move forward efficiently. We progressed in team work discussions on the various points and then we assigned tasks to each team member. By analyzing the market, we were also able to present a business plan. It was great experience to test our limits in terms of work capacity and project concentration"*, adds Jerome who concludes: *"We were able, above all other considerations, to discover new project management tools specific to the world of start(ups and these we learned from the Start-up Weekend organizers and various coaches on hand during the event."*

When the 54h expired, the teams presented their work before the Jury – the latter comprising professionals of the fields studied and other staff members of UTC, to try to convince them that their projects were indeed viable.

In the final selection, three start-ups received awards after this year's edition:

- **CitiZEN:** an "app" desired to bring together a mass of information relative to a city: including transport, road works, landmarks ..
- **Picatch'Us:** this «app » allows you to create a photo-album that can be shared to simply exchanging photos on special occasions, events, nights-out.
- **Web Family:** a system to identify residents' clothes (in retirement homes).

For these teams, the game goes on, and the teams want to pursue their projects. *"For example, during the summer holidays we hope to develop the 'app' and we are beginning to imagine a partnership with the City of Compiegne"*, confirms Jérôme Durand, project CitiZEN. *"A long-range objective of our project would be to see it universally useful and spreads over a maximum number of cities: in this configuration, the 'app would update itself as it moves into, or nears a new city. However, we do not want to 'jump the gun', so to speak. Just making the app work for and in Compiegne is going to require loads of work, but at the same time it will allow us to adjust parameters to have the 'app' fit urban problems even better"*.

The *PicatchUS* team has the ambition to pursue the project to its end: "The 'app' base enables instantaneous sharing of the photos with a group of friends and family during a given event in a totally safe manner, adds Nicolas Zantour, a UTC graduate. Even for the participants exterior to UTC, the story goes on *"I would like to see computer science students collaborate for some of the 'app' developments accompanied by our Project leader"*, announces Fabrice Faradèche.

The adventure goes on too for the organizers of the Start-up Weekend: "The concept has been tested and certified and we now know exactly what our audience expect and the process we must follow for the next edition, in the 2015 second semester". ■

plus d'infos ▶ http://webtv.utc.fr > page d'accueil > Startup Weekend Compiègne

www.citizen-app.co

http://picatchus.fr

AGENDA

interactions.utc.fr • www.utc.fr

Presentation of the UTC Innovating Projects Competition
Sept. 24-25, 2015

The engineers, Master's and PhD degree students will present their projects at the 7th UTC Innovating Projects Competition, the projects covering science, technology, society, culture, art … at the UTC Daniel Thomas Innovation Centre. The objective of the competition is to allow for maturation of innovative projects and to support the best competitors with a financial aid and a personalized accompaniment.
http://interactions.utc.fr > Special issue: the UTC Daniel Thomas Innovation Centre

The Science Fête at UTC
Oct. 8-11, 2015

fête de la Science

The theme this year that the research scientists and students present at their workshops in the "science village" will be "light". (2015 is the international Light Year), climate and medical evolutions during the First World War (X-rays, medical emergency teams, reconstructive surgery, treatment of post-traumatic stress syndrome (PRSD), blood transfusions, antiseptics, aspirin, blood-pressure monitors …).
http://www.utc.fr/fetedelascience

The conference to mark the 40 years of Digital Mechanical Engineering …
… to Virtual Certification protocols
Nov. 26-27, 2015
The UTC Roberval Laboratory plays an active role in the development of digital modelling in the mechanical engineering sciences community. The Roberval Lab is organizing this conference to mark the 40 year of digital mechanical engineering, and aims as bringing together representatives of the industrial world and the research community to make a state-of-the-art analysis of modelling to date and to identify the prospects for further developments in the near future.
http://webtv.utc.fr > Laboratoire Roberval

UTC diploma awards ceremony
Nov. 21, 2015

The 2015 diploma awards ceremony will be honoured by the presence of this year's Godfather, Christophe Lecante, CEO and Managing Director of TKM, President of the Innovation Standing Commission of the Richelieu Committee and President of IHEST.
http://webtv.utc.fr > Notre quotidien > Remise des diplômes et Parrains
www.tkm.fr

PUBLICATION

Towards an automated Society

Bernard Stiegler, philosopher and professor at UTC, has just published *« La société automatique, Tome 1 : l'avenir du travail » [«Towards an automated Society, Vol.1 : the future of work»]*, Editor Fayard, Paris. *« Interactions »*, on this occasion, exchanged with the author about certain fundamental questions he addresses in this publication.

The idea of replacing human labour by machines is nothing new, so why is automation today unique, from a historic point of view?

"The previous phase of automation, called Taylorism, was a model launched by Henry Ford as early as 1912 was a form of mechanisation that called for unskilled workers who were nonetheless specialists. As digitisation and associate algorithmics progressed, they enabled modern automation processes to be implemented without the intervention of any human operators. A report, from the Roland Berger Consultancy agency, tells us that 3 M jobs will be under threat in the coming decade. Salaried positions in the long-term will become marginal activities. The Keynesian movement in the 1930s made Taylorism viable by redistribution, through work, of a part of the productivity gains and through creation of purchasing power. Today we need macroeconomic changes to implement the retribution function beyond job positions - and failing this, the national economy will become non-viable."

Can you identify for our readers the stages leading to data-intensive economics?

Internet developments led to what was termed, in the early 1990s, a networking Society – i.e., everyone is in a general network configuration. In the 2000 decade, the so-called Web 2.0 (combining meta-data, social networks and the smartphone users) led to what Crary calls "24/7 Capitalism" where data flow can be measured moving at 2/3 the speed of light - nerve signals in our human body only progress at 50m/s – enabling massive integration of biological, psychological, social and technological automation-intensive processes."

Are all professional sectors concerned?

"Yes, all professions, running from site labourers to medical practitioners will be concerned by automation. But "automation" does not only imply massive installation of robots: production of a large fraction of value is created beyond the enterprises and institutions' frontiers, via each person involved depending on whether we participate closely or not, in a data-intensive economy. It is the training courses in a massively network prone Society which economists like Yann Moulier Boutang refer to as "positive externalities". Generalization of salaried work positions was implemented to the detriment of work per se, which means that the position derive from a 'proletarian' process where the employee is "dispossessed" of his knowledge and know-how. Nowadays, we see the highest intellectual functions are concerned by the proletarian movement: that is what I am trying to demonstrate when I analyse the positions and statements of Chris Anderson and Alan Greenspan."

How should we go about creating a more equitable digital economy?

"Your question should not be limited to the notion of equity but extends to include solvability and even the survival of the human species. The redistribution of productivity gains will no longer transit via salaries. Automation in the next 20 years will allow us to gain lots of time during which people will be able to cultivate their talents and capacities. To encourage people to adhere, contributive networks will need to be developed enormously, viz., those that constitute knowledge co-operatives and remunerate the acquisition of new knowledge by a "contributive income", with the proviso that they understand that they must value add to this in a contributive social project (entrepreneurial, associative or financially supported by public authorities). Such a form of redistribution will consist of payments made on the same model as the entertainment intermittent staff, for what Amartya Sen calls "personal capacities'.

Digitisation therefore represents a very rich tool to share knowledge?

"As Lawrence Lessig foresaw it in January 2000 and as Dominique Cardon demonstrated more recently, the Web – which initially was based on value-adding to differences – has regressed to aa large extent. We really need to reinvent the Web. Europe invented the html code and should now build up what we at ITI call a "hermeneutic web" – which I practiced and sketched out with my UTC students in the IC01 credit course at UTC, via a platform where they could share their lecture-notes". ■

d'infos plus **http://webtv.utc.fr > recherche : Colloque "innover l'innovation" à la Sorbonne**

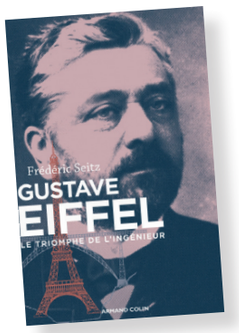
http://webtv.utc.fr > recherche : Séminaire "Innovation et Numérique", intervention de Bernard Stiegler

http://arsindustrialis.org/les-pages-de-bernard-stiegler

PUBLICATION

The Eiffel Tower

As France prepares to host the Universal Exhibition 2025, Frédéric Seitz, a DPLG qualified architect, in his recent publication « Gustave Eiffel, le triomphe de l'ingénieur [Gustave Eiffel or the triumph of engineers »], edited by Armand Colin, Paris reveals some of the less-well known facts about this most famous French engineer. Behind the image of a genius as a creator, as a promoter of industrial techniques, the book retraces the track-record of a businessman with definite scientific talents.



What biography Frédéric Seitz offers here depicts a strong, complex personality whose best features are not necessarily technical. *"The most striking thing about Gustave Eiffel is the capacity he displayed to have the best specialists in his service and to galvanize the influential people of his time, right from the start of his career"*, notes our lecturer-research scientist Seitz. He graduated from Ecole Centrale [one of the finest engineering schools in France] in the elective specialty chemistry which enabled him to plunge into material sciences, which later proved his strongest and most illustrious area. *"His professional path is astonishingly close to that of another Ecole Centrale graduate, Francis Bouygues, who created a reinforced concrete company that has now grown into a diversified industrial empire, directed today by his son Martin"* says Frédéric Seitz.

A talented opportunist

The Tower episode, so to speak, is the accomplishment of a virtuoso career in metal constructions, and also reveals some aspects that are far-removed from the legendary Eiffel. In the book, we discover that Eiffel in fact 'developed ideas' proposed by others. *"He allowed the engineers of his design office to work on the tower project. And when it was sufficiently advanced, he took over and part financed the construction out of his pocket, despite strong opposition from Parisian intellectuals and artists"*, we learn. From this obstination arose not only an exceptional technical feat, but also a grand financial success since the income from the entrance tickets quickly covered the cost of building the tower … The final chapters of the books look at the not well known scientific career of Gustave Eiffel in his late years. He was seriously condemned in what was known as the Panama Canal scandal, and at which point Eiffel abandoned his enterprise and concentrated on scientific matters and research activities. *"Towards the end of his life, Eiffel conducted experiments in three areas: wireless, meteorology and aerodynamics. He was recognized for this work by the scientific community at large. Some even say that he would have been one of the pioneers of modern aviation"*, note historian Seitz.

In the 300 pages of his book, Seitz also touches on some more personal aspects of the engineer Eiffel, including the strange 'family' formed by Eiffel, his daughter and son-in-law, an engineer also who took over the construction company. The book teaches us that while Eiffel enjoyed and led a flamboyant public life, he managed to keep his private sphere in the dark and thereby continue to reinforce his personal myth. ■

plus d'infos **http://www.utc.fr/avenues**

PUBLICATION

More (much more) about corrosion

Jerôme Favergeon, Director of the UTC Mechanical Engineering Department (UTC-GM) has co-authored with Sébastien Chevalier, a university colleague at Dijon, a book entitled *"French activity on high temperature corrosion in water vapor"*. The aim of the publication was to gather under one cover the contributions of various French laboratories in order to gain a better understanding of the phenomena intervening during a high temperature corrosion event with the presence of water vapour.

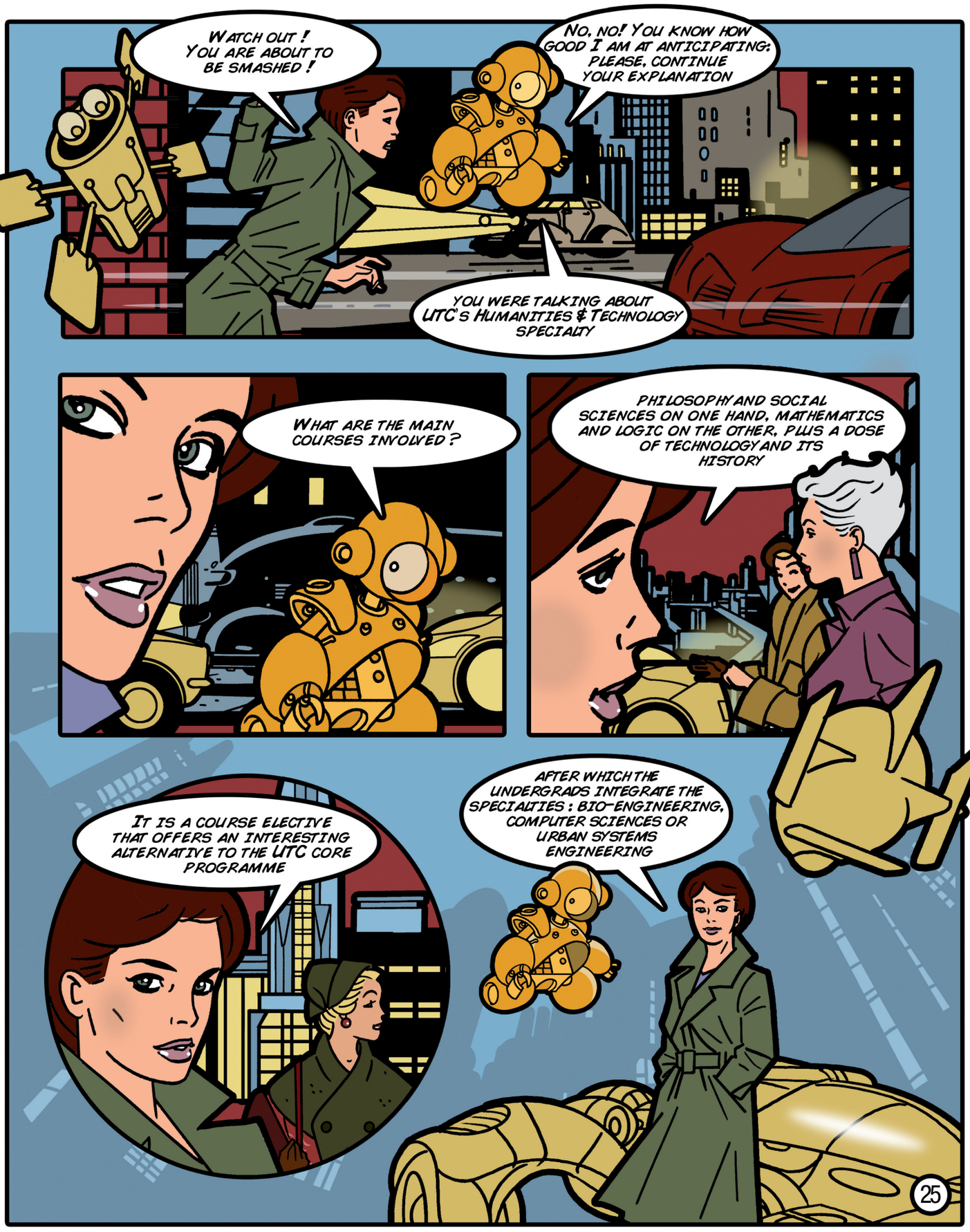
"When we attend international conferences on the subject, we do not hear very much about French activities despite the fact that we a lot of high-level research on corrosion in the country", explains Jerôme Favergeon, a specialist of high temperature metallic alloy durability and behaviour. The book is written directly in English, as a collective piece of work and hopefully will fill in this shortfall in 'comm' and PR success. The works covered are those conducted by the GRD created between 2008 and 2012 on the corrosion theme, under the aegis of the CNRS. Some 40 authors, representing 12 different laboratories throughout France. It is a collegial text, where each chapter deals with the reactions of a given family of metallic alloys.

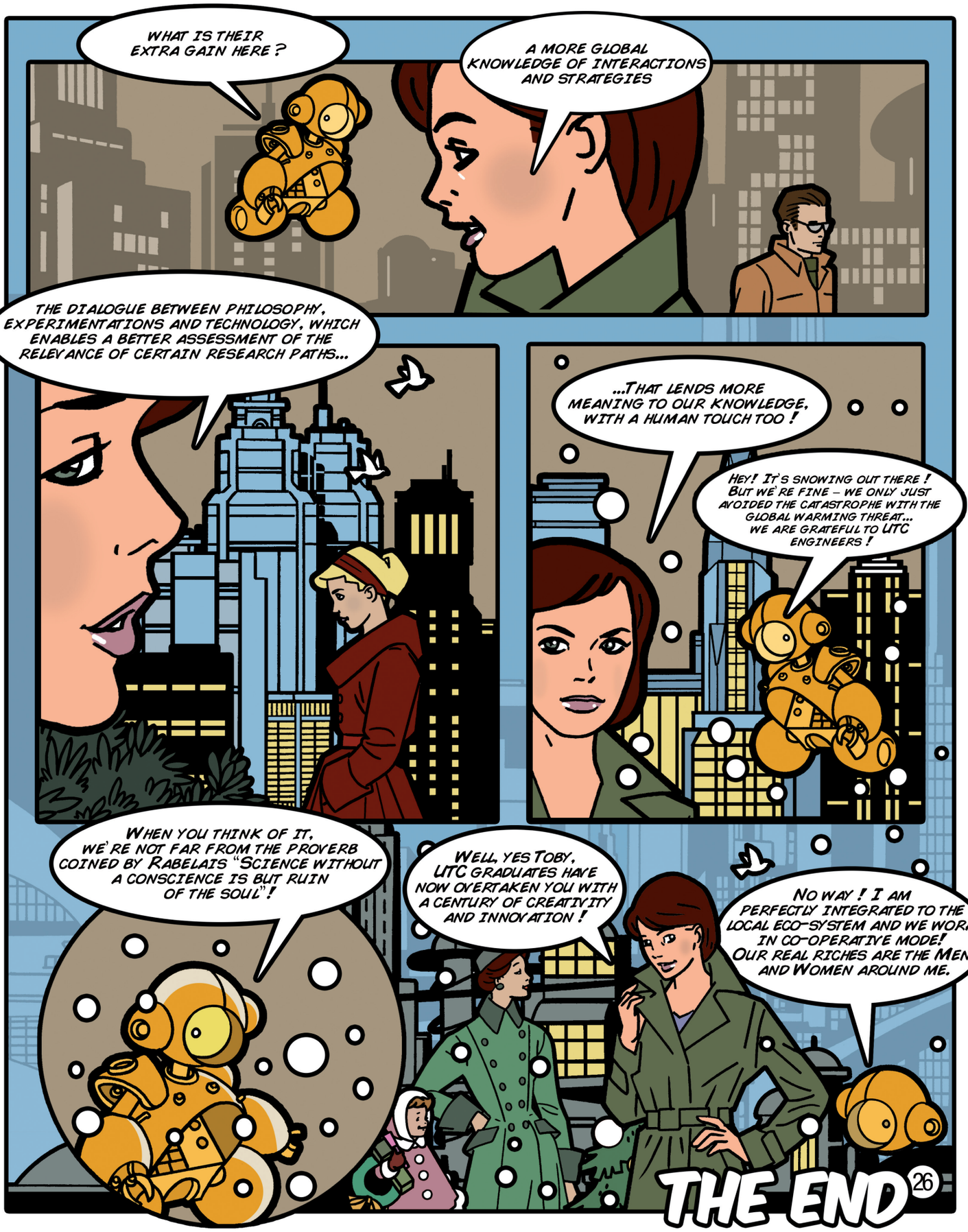
The results of these research activities have numerous direct impacts in industry. It was towards the end of the 19th Century that scientific studies were made of high temperature en corrosion but it only became structured, so to speak, as of the 1960s when nuclear power production was developed in France; the ambient atmosphere with a non-negligible water vapour content and numerous other heat-intensive technologies are also concerned. By studying high temperature corrosion with the presence of water vapour, we can assess the life expectancies for parts of internal combustion engines (cars), aircraft engines, fuel cells, industrial boilers or household waste incinerators …

We have known for a long time now that humidity accelerates corrosion, but the underlying mechanisms are still difficult to understand in real situations. The USA and Japan are now showing a keen interest in this domain. In 2017, UTC will be hosting the Special Days on Heterogeneous Kinetics that will contribute to throwing some extra light on French research in the field of high-temperature corrosion. It will also provide the opportunity to recall that UTC is at the cutting edge in investigations as to the relationships between mechanical behaviour and high temperature corrosion. ■

plus d'infos **www.utc.fr > Recherche / innovation > unités de recherche > Mécanique acoustique et Matériaux**

On its 40th anniversary, UTC rewrites its history, in comic strip style : **In the heart of the Future**




WHAT IS THEIR EXTRA GAIN HERE ?
A MORE GLOBAL KNOWLEDGE OF INTERACTIONS AND STRATEGIES
THE DIALOGUE BETWEEN PHILOSOPHY, EXPERIMENTATIONS AND TECHNOLOGY, WHICH ENABLES A BETTER ASSESSMENT OF THE RELEVANCE OF CERTAIN RESEARCH PATHS...
...THAT LENDS MORE MEANING TO OUR KNOWLEDGE, WITH A HUMAN TOUCH TOO !
HEY ! IT'S SNOWING OUT THERE ! BUT WE'RE FINE – WE ONLY JUST AVOIDED THE CATASTROPHE WITH THE GLOBAL WARMING THREAT... WE ARE GRATEFUL TO UTC ENGINEERS !
WHEN YOU THINK OF IT, WE'RE NOT FAR FROM THE PROVERB COINED BY RABELAIS "SCIENCE WITHOUT A CONSCIENCE IS BUT RUIN OF THE SOUL" !
WELL, YES TOBY, UTC GRADUATES HAVE NOW OVERTAKEN YOU WITH A CENTURY OF CREATIVITY AND INNOVATION !
NO WAY ! I AM PERFECTLY INTEGRATED TO THE LOCAL ECO-SYSTEM AND WE WORK IN CO-OPERATIVE MODE! OUR REAL RICHES ARE THE MEN AND WOMEN AROUND ME.
THE END 26

She chose the world as her challenge

Sabine Beslay, based in Shanghai, is Senior Manager for Project Engineering covering the Asia-Pacific Region for BASF. She graduated from UTC in the elective specialty Process Engineering and we invited her to comment on her rich professional track-record including numerous stays abroad.

Back in her high school and college days, science and technical classes were her preferred courses. Sabine Beslay chose to do engineering because of its concrete contents with rapidly visible results, so she registered at UTC in 1985 and chose the elective Process Engineering.

"To tell the truth, chemistry was not my favourite area, but it had the advantage of opening doors to a future engineering career", she notes. What she like above all at Compiegne was the polyvalent training students get there and the practical orientation towards operations tasks and design of production units – technical draughtsman work and handling of spatial problems.

Intellectual and human opportunities

"I have excellent recollections of UTC both in terms of the training received and also from a human point of view. UTC ensures you gain an independent mind and it teaches a rigorous approach to work", sums up Sabine. She then insists on the variety of themes and subjects covered at UTC that allowed her to acquire a large range of skills and knowledge without being dissipated. Numerous corporate internships during the cursus were seen as highly value adding experiences and useful for her future professional career. Direct application of her new academic knowledge was very appealing:

"My preferred courses were in the lab and workshop sessions where we were invite to directly develop and complete full-projects". The UTC *"melting pot"* saw students form all sorts of cursus, social; backgrounds and nationalities mix together. *"This led to a certain opening of the mind which you need if you want to work in international affairs"*. Another strong point of her 3 ½ year stay at Compiegne was the stimulating atmosphere without an exacerbated sensation of competing with each other. "Contrary to what happens in other major engineering schools in France, UTC students have both time to do their studies and enjoy their leisure-time too."

A truly international career

Graduating from UTC in 1989, Sabine Beslay began her professional career as a process engineer in Rhône-Poulenc (later Sanofi) factory in the Lyon area, producing silica with its numerous industrial applications. *"In Lyon, I was faced with a wide range of tasks to accomplish and I had to use what I learned in my course work and also what I learned "in the field"*, recalls Sabine, who is now responsible for a geographic area as large as Europe. Autonomy, challenges, short and mid-term projects, turned those early days into a background of moments of passion which marked the rest of her career. *"The links and exchanges with both colleagues at work and with our customers gave me lots of opportunities to travel. Thereafter I have also tried to avoid getting into a dull routine and am always looking for new challenges"*.

After working for a while in England, Sabine Beslay was appointed to the Middle Empire in the early 2000 years, again with Aventis. Her first contact with China played an important role in her decision to prolong her stay there. *"I began at Hangzhou, in a splendid setting which is so different from the gigantic, noisy Shanghai where I live presently"*. The enthusiasm of her Chinese colleagues, their desire to learn and to share knowledge and know-how, allowed Sabine to integrate the local scene quickly. Her early years in China also taught here some useful communication rules: *"I learned, for example, that a simple and polite "yes" does not necessarily means that the person has understood and you must not hesitate to repeat yourself"*. Since she arrived 15 years ago, the practice of English has progressed. The relationships you have with the Chinese authorities is still somewhat difficult unless you have some fluency in Chinese. Her advice to students tempted today by a career with a Chinese horizon, is that they seek an appointment with a foreign company.

Managing a team which comprises a majority of Chinese nationals also allowed her to discover and understand local management practice. Sabine note that her staff had a strong inclination to learn and displayed real enthusiasm for the job, but they were lacking in autonomy and the desire to take any initiatives. Much more than elsewhere, planning and regular monitoring of work in progress are fundamental to complete a project satisfactorily: *"the hierarchy and a total respect for orders play a far more important role than in Europe. You simply cannot set a target without giving precisely all the methodology to be applied to get there"*. Her conclusion is that in China, for the time being, the role of an individual is something that has yet to be defined. ■

BIO-NOTES

1985-1989 Graduated from UTC with the elective specialty Process Engineering

1989-1992 Process engineer Rhône-Poulenc Fine inorganic chemicals, Lyons

1992-1996 Process engineer Rhône-Poulenc Fibres & Polymers (Alsachimie)

1996-2000 Process Development & Quality Control team, Aventis Cropscience, UK

2001-2004 Process Site Manager, HSE & Quality (including Quality Control) for Aventis then Bayer, Hangzhou, China

2004 to date, Regional manager Asia Pacific Region, BASF, Shanghai, China

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