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APRIL 2025 ### N° 65
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FROM THE PRESIDENT'S DESK

Artificial intelligence (AI) technologies are now being deployed in many sectors, including Healthcare. However, these promising advances are not risk-free, especially when they directly impact us as humans. This implies the rigorous development of specific, reliable and robust tools, designed specially to meet the specific requirements of the biomedical sector.

For example, as part of the European MultiPhys Microcaps project, funded by a European Research Consolidator Grant (ERC), UTC's BMBI (Biomechanics and Bioengineering) Laboratory is in charge of studying the dynamic behaviour of deformable liquid-core capsules thanks to the development of digital microcapsule twins. This promising project aims in particular to improve and accelerate the development of innovative targeted therapies.

In addition, other AI applications are also emerging at UTC, with the same constant concern for efficiency and, above all, patient safety. This is particularly the case for the predictive model developed with the Amiens University Hospital to help prevent the risk of premature births, or the tools designed with the Charles Foix Hospital of the AP-HP (Assistance Publique – Hopitaux de Pars) to anticipate and alleviate muscle aging. UTC-Compiegne is also collaborating with the École Centrale de Lille on multi-scale models to better prevent the elderly from falling down. Similarly, personalized solutions to aid in the diagnosis and treatment of bile-related diseases are being developed in partnership with two laboratories at Sorbonne University and two AP-HP hospitals. Another flagship project concerns facial rehabilitation, conducted in close collaboration with the Amiens University Hospital.

All these tools - which are constantly being improved - provide valuable assistance to Healthcare professionals in terms of diagnosis and clinical decision support. Nevertheless, vigilance remains essential, particularly with regard to the sensitive issues of patient data confidentiality and security.

Claire Rossi,
directrice de l'UTC

TRAINING

A new course in the Humanities and Creative Industries in the Master's degree

As of September 2025, UTC will offer a new course entitled "Design, Uses and Technological Research" within the Humanities and Creative Industries Master's degree programme. From the start of the 2025 academic year, the first intake of some fifteen students will be trained in issues related to the interactions between humans and their natural, social and technical environment.

The new course 'Design, Uses and Technological Research' relates to understanding the issues related to innovation and complexity. The idea is to enable students to broaden their spectrum of attention, their vista, to better understand the processes of technical "constitutivity" in a diversity of environments. We do not choose the stance of technical neutrality or simple "solutionism" but consider that when technological issues are tackled by humans, it has effects on them individually and collectively," explains Olivier Gapenne, Director of the UTC Costech laboratory since last September. Established in 1993, the Costech research unit explores the questions related to technology, to the science of human production, with the aim of improving design. The internationally renowned philosopher Bernard Stiegler founded the laboratory and devoted his work to the question of technology and its implications for the understanding of contemporary Society. "The objective of the Master's programme, under the direction of Florent Levillain, is to provide students with new skills in design centred on the human experience, leading them to master the process of designing and producing innovative technological products and services." It should be noted that the Humanities and Creative Industries programme offers two courses at UTC, one of which is part of a dual curriculum in partnership with ESAD in Amiens, UTC contributing its knowledge in the field of cognitive sciences applied to design and user experience. Students enrolled in this "design and experience creation" course will follow the DNSEP (graphic design options) courses at the ESAD site for two years, as well as certain courses offered in the new course at UTC.

Relations between humans, technology and society

The UTC-Costech laboratory, a place of interdisciplinarity, now operates with five programme teams whose work is based on the common foundation of a shared thesis attributing a constituent role to technology. The research topics of narrative, vulnerability, bifurcations, intersubjectivity and cognition give rise to programmes that enable their study in conceptual, theoretical, concrete, experimental and even operational terms. This research is also directly connected to environmental concerns about sustainability and societal concerns about the sources of social fracture. "Our team is part of the Technology, Societies, Humanities (TSH) UTC department, and several of its members are particularly involved in the Hutech course, which teaches how to direct technological development serving high human and societal values," concludes Olivier Gapenne. The aim is to work together in a cross-disciplinary and collective way, including with other UTC research entities, so that engineering students acquire a real appetite for technological research. The need in this area is immense and many questions need to be explored in depth. UTC-Costech has no intention to content itself with academic research and is implementing real-life research for the benefit of numerous actors in Society." ■ **KD**

A common charter, symbolizing the unity and shared values of the UT group

Prof. Claire Rossi, Director of UTC, Prof. Christophe Collet, Director of UTT-Troyes and Prof. Ghislain Montavon, Director of UTBM (Belfort-Montbeliard), jointly presented the UT Group's basic identity values at a press conference held in Paris in December 2024 and co-signed a common charter to this end.

On December 10, 2025 Claire Rossi (UTC), Christophe Collet (UTT-Troyes) and Ghislain Montavon (UTBM-Belfort-Montbeliard), the three directors of the Universities of technology (UT), signed the UT Group charter. This marks an important step in strengthening collaboration between Groupe UT members. "Our universities, embodying the "third way" of higher education, have positioned themselves, since 1972 with the birth of the first UT (viz. UTC) as catalysts of innovation, training in engineering and research, a community carrying humanist values", emphasizes Claire Rossi, President & Vice-Chancellor of UTC. The group of universities of technology is positioned as a dynamic community of education, research and innovation, uniting the strengths of these establishments to meet current and future challenges in an ethical and responsible manner. Exchanges within the UT Group are proving to be very positive, driven by a strengthened collaborative dynamic. The teams at the various UTs are increasingly involved in a dynamic process, sharing as they do common objectives, demonstrating a real synergy. "My two counterparts, Claire Rossi and Ghislain Montavon and I are unanimous: together we are stronger than if acting apart. In an uncertain context, this unity enables us to speak with a more powerful and coherent voice, notably through coordinated and structured communication," assures Christophe Collet. The UT group enables us to change scale by bringing together a larger number of students, PhD doctoral students and alumni, while developing an even wider network of partnerships with companies."

A unique and valuable synergy in the academic landscape

This consortium makes it possible to carry out large-scale projects that would not be feasible on a single establishment basis. Cross-disciplinary research projects encourage innovation and collaboration between the various UTs. Internationally, initiatives such as UTSEUS and partnerships in Africa illustrate the group's ability to engage in shared projects, contributing to a global academic and technological network. "This collaboration not only reinforces pedagogical excellence, but also the ability to respond to contemporary technological challenges, while training tomorrow's engineers. UTBM stands out for its resolutely innovation-oriented positioning. In this respect, the integrated "CRUNCH" scheme, deployed since 2017, illustrates perfectly this ambition, promoting a cross-disciplinary and collaborative approach. UTBM has also invested in steering and decision-making tools. For almost a decade now, it has been developing sophisticated data warehouses and high-performance indicators to optimize internal management. These implementations are fully shared within the UT network," adds Ghislain Montavon, who believes that belonging to this network of universities of technology enhances the visibility and reputation of each establishment. "Indeed, the 'UT' collective brand is a guarantee of quality and expertise, recognized both nationally and internationally. This recognition attracts the best talents in both students and professors and arouses the interest of leading industrial and institutional partners".

A group committed to the dynamics of European universities and AI

UTT is committed to the dynamics of European universities, acting as AI coordinator of the EUT+ Alliance, the European University of Technology, and became involved in the dynamics of European universities at a very early stage. Today, European courses are already available to students, reinforcing the international scope of our courses. UTC has also become a member of the SUNRISE alliance of European universities since this year. Christophe Collet adds: "One of our current key areas of reflection also concerns the impact of AI (artificial intelligence) on engineering education and training. Through Groupe UT, we are working to train engineers in the thoughtful and ethical use of AI, to support teacher-researchers in integrating AI into their teaching methods, and to define the key skills needed to anticipate and respond to tomorrow's technological challenges." It's worth remembering that the UT Group establishments carry out ambitious, first-rate research. It makes a significant, even disruptive, contribution to scientific and technological advances for ethical and responsible progress," concludes Claire Rossi. We foster creativity in students and research scientists and engineers by stimulating transdisciplinary and intercultural approaches. But we do not neglect to cultivate the freedom to experimentation in order to encourage innovative, ambitious, even disruptive approaches, up to and including the launching entrepreneurship ventures." ■ **KD**

UTC STILL TOP OF THE BILL (FRENCH ENGINEERING SCHOOL RANKINGS)

UTC continues to stand out in the Engineering Schools 2025 rankings. It takes 5th place in the News Tank-Emerging ranking, which assesses cooperation with companies, highlighting its strong links with industry and its innovative training, as well as the high employability of its graduates. UTC is also ranked 1st in L'Obs's 2025 ranking of the best post-baccalaureate engineering schools, and 2nd among public post-baccalaureate schools in the Figaro Étudiant ranking, thanks to the quality of its training and professional integration. It ranks 4th among public post-baccalaureate schools (in the bracket 601-2 450€) in the Étudiant ranking. Finally, in the L'Usine Nouvelle ranking, UTC is ranked 3rd among post-bac public generalist schools, and 4th for all specialties combined. These rankings testify to its excellence in innovation, research and preparing graduates for the job market.

ANNE-VIRGINIE SALSAC LAUREATE OF THE 2025 SATT LUTECH TROPHIES

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Anne-Virginie Salsac, Director of Research at the BioMechanics and BioEngineering (UTC-CNRS--BMBI) Laboratory is declared the winner of the SATT LUTECH 2025 Trophies. She was one of 8 laureates honoured at a ceremony on February 6, 2025 presided over by SATT LUTECH President Philippe Watteau, in the presence of Philippe Baptiste, Minister for Higher Education and Research and Nathalie Drach-Temam, President of Sorbonne University. These awards highlight innovative research projects with high potential for scientific, economic and societal impact, promoting technology transfer to industry. Our congratulations go to Anne-Virginie Salsac and the other SATT LUTECH Trophy laureates!

SPORT ÉLITE AVIRON : AN AGREEMENT SIGNED FOR A UNIQUE PROGRAMME

UTC and Sport Nautique Compiégnois (SNC) signed a partnership agreement on January 25, 2025 to promote high-level rowing activities. The aim of this collaboration is to offer the student community a double curriculum of excellence, combining academic training with an ambitious sporting career. Thanks to the "Sport Élite Aviron" programme, students will be able to combine their studies with intensive training. The SNC will host these UTC students in its structure, with professional coaching and the equipment they need to progress. This scheme, unique among engineering schools, will enable top-level rowers to pursue their sporting goals while obtaining a top-quality engineering degree. ■ PS

RESEARCH / INNOVATION

Optimizing the sustainability of electric power battery units

Nicolas Damay, lecturer, works at the UTC Roberval laboratory. Khadija El Kadri Benkara, a research scientist in the same laboratory, is responsible for all electrical energy research platforms. Their research focuses on optimizing the life and performance of electric batteries.

While chemists are responsible for the development of new materials and the creation of high-performance battery cells, the problems associated with their control in systems fall more within the remit of electrical engineering. This means controlling electrical and thermal (or even mechanical) behaviour, while at the same time gaining access to information limited by on-board sensors.

Already proud of its recognized expertise in electrical machines, the team turned their attention to batteries in the early 2000s, under the leadership of Christophe Forgez. In the field of electrical engineering, this ranges from battery sizing to battery control, based on multi-physical modelling. The team's scientific approach is to better understand electrochemical and thermal phenomena, subsequently transcribed into coupled models known as "digital twins". "These tools are easier to manipulate than physical objects and will enable colleagues to work on optimizing design or control, with efficiency objectives in terms of mass reduction and durability, for example", explains Nicolas Damay.

In their research activities, the team members place great value on using an experimental approach to enrich and validate its models. This is done with a view to meeting and resolving technological and industrial challenges. Hence the development of various research platforms. "These platforms cover the entire powertrain chain, from the battery to the electric machine, including power converters. Generally speaking, my research focuses on the design and multi-physics modelling of on-board energy conversion devices. More specifically, I'm currently supervising a thesis dedicated to the thermal parameters of batteries", adds Khadija El Kadri Benkara.

It turns out that battery temperature is the primary factor influencing ageing. "Temperature also poses a safety problem. Hence the importance of measuring the heat generated by the battery, which can be precisely determined using calorimetry," adds Khadija El Kadri Benkara.

UTC's recognized expertise in this field enabled her to join the HIPOBAT (High Power Batteries) project, which brings together six French and six German laboratories to develop high-power "all-solid state" batteries for rapid charging and discharging. "It's a multi-disciplinary, multi-scale project. Research will focus on new battery technologies, particularly those based on sodium-ion. This choice is motivated by a desire for sovereignty - sodium can be extracted from seawater - but also by environmental impact", explains Nicolas Damay. ■ **MSD**


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KHADIJA EL KADRI BENKARA ET NICOLAS DAMAY

Biomechanics in Healthcare sectors:

using specific artificial intelligence models

Artificial intelligence (AI) has become indispensable in many fields, not least healthcare. At the Biomechanics and Bioengineering Laboratory (UTC-CNRS-BMBI) - UMR CNRS 7338 -, teams are working on issues such as improving the diagnosis and treatment of bile ducts ailments, preventing muscle ageing and facial rehabilitation in the event of transplants or paralysis. AI tools are used to develop "digital twins", notably for the development of microcapsules for targeted therapies or for the prediction of premature baby deliveries. Depending on the project, the patient-specific models developed by the teams help practitioners to diagnose, monitor or treat, and ultimately improve patient care.

AI tools differentiated by specific applications

Florian De Vuyst is a university professor specializing in applied mathematics and a research scientist at the Biomechanics and Bioengineering Laboratory (UTC-CNRS-BMBI). He explains the different models of artificial intelligence (AI).

Among the most widely used AI models are deep neural networks. "These models have the advantage of establishing a precise relationship between input and output data. However, the learning phase requires a large volume of data (measurements, observations, simulation results, contextual data...) and demands significant computing resources. This type of AI can be used to better understand the functioning of complex experimental devices where several physics are involved. Neural networks are capable of reproducing the general behaviour of multi-physics systems and enable sensitivity and optimization studies to be carried out on operating parameters", he explains. In collaboration with Timothée Baudequin, the laboratory is planning to use deep neural networks to predict the behaviour of electrospinning devices. "These are machines that produce nanofibres to make scaffolds for cell cultures", he says.

Other AI models used at UTC-CNRS-BMBI also include statistical learning or machine learning. "Members of the Characterization and Personalized Modelling of the Musculoskeletal System (C2MUST) team use this type of model to determine the behaviour of musculoskeletal systems and, for example, predict aging. It's a probabilistic approach that takes account of uncertainties in models, data or experimental conditions", stresses Florian De Vuyst.

Other AI tools are dedicated to assisting image processing, enabling the detection of anomalies or the search for important features in images, not

necessarily visible to the human eye. “These can be static images or videos, but also dynamic 3D or even 4D images. This is one of Isabelle Claude's areas of research, as she supervised Abdelhadi Essamlali's thesis on bile duct reconstruction. It's a patient-specific approach, where the patient's organ is reconstructed in volume to help the practitioner prepare for surgery,” he adds.

It is often the application that determines the development of a particular type of AI. “Take, for instance the case of determining the mechanical behaviour of living tissue. Usually, we define one or more laws and try to find the one that best reproduces experimental measurements. Now, we use AI techniques in which we integrate these empirical laws into a family of more general laws, and the neural network finds the sub-family and coefficients that are closest to reality. In a way, it's a general integrated approach that enables us to be more generalist and more precise when modelling a biological tissue”, he explains.

Finally and more recently, AI has been used to accelerate numerical simulations of mechanical models. “These include, for example, physics-informed neural networks, which have the advantage of being more general and faster than conventional solvers such as finite element methods. In the learning phase of neural networks, a so-called loss function is used. In a PINN, the loss function is an equation residue. The problem is solved when the loss reaches zero,” he explains.

Today, AI models are used in most fields. Nevertheless, a certain amount of vigilance is still required with regard to possible biases. “AI should be seen as an assistant which, particularly in the biomedical field, can provide a complementary analysis or diagnosis that must imperatively be validated by human practitioners”, concludes Florian De Vuyst. ■ **MSD**

Tools to prevent certain medical risks

Imad Rida is a senior lecturer and research scientist at UTC-CNRS-BMBI in the C2Must team. He contributes to the development of AI models adapted to various research projects, notably the prevention of premature birth and muscle aging.

After completing a thesis on machine learning and more specifically on representation learning for classification, at INSA Rouen, Imad Rida remained there for two years as a contract teacher-research scientist (ATER). In 2019, he was recruited to become a lecturer at UTC. His accumulated experience in AI has enabled him to develop a number of tools adapted to specific problems. “This is the case for the prevention of premature childbirth with Dan Istrate and Catherine Marque, for example, or the assessment of aging of the musculoskeletal system with Sofiane Boudaoud. In these two areas, my aim has been to introduce new AI techniques based on data, often electrical signals, collected using electrodes called HD-sEMG. I use AI techniques to analyse the data collected, as the data collection is carried out by other players, such as maternity wards for pregnant women, for example”, explains Imad Rida.

Among the specific tools developed? “When there is little data, I use parsimonious representation learning techniques. This is known as dictionary representation learning. However, when there's a lot of data available, deep learning techniques are used. We can, however, use deep learning in the first case, by using techniques known as “data augmentation”, by multiplying the interactions between the available data, or we can use generative AI. In my various projects, I'm mainly working on classification tools. Let's take the case of muscle ageing, where we define age classes: 20-30 years, 30-40 years, 40-50 years and so on. We know that the age of a muscle can differ from its actual age. We have a database with the muscular characteristics of different people of different ages and, when we recruit a new subject, the AI will assign him a class. This may be higher than the subject's actual class, for example, because the data collected from the subject's HD-sEMG shows that, for reasons of sedentariness or lack of physical exercise, the state of the subject's muscle does not reflect his or her real age”, he explains.

AI tools are constantly evolving, and other techniques are bound to develop to meet specific uses. “AI is certainly a most welcome aid to decision-making and diagnosis. But vigilance is still required, particularly in terms of confidentiality and data protection”, concludes Imad Rida. ■ **MSD**

Risks related to premature child-birth and to catching infectious diseases

A lecturer and research scientist at UTC, Dan Istrate works in particular on connected biomedical tools. Two current projects focus on preventing the risk of premature delivery in child-birth and detection of the risk of the elderly at home catching infectious diseases.

The first, carried out in collaboration with Imad Rida and Amiens University Hospital, concerns at-risk pregnant women. "Thanks to AI tools developed by Imad, the aim is to predict the date of delivery, enabling doctors to prepare for the birth and care of the baby under optimum conditions. HD-sEMG electrodes placed on the pregnant woman's lower belly pick up uterine muscle signals and, depending on the characteristics of the signals, predict that the woman should give birth 1 to 2 weeks after the measurements. This device can be used at home. We used machine learning, then deep learning. Not only does deep learning provide better performance, but it is also capable of generating artificial data that can be used to build more accurate models," he explains.

The second project is being carried out in collaboration with Vincent Zalc, the Toulouse University Hospital and the LAAS laboratory. "This project aims to detect infectious respiratory or gastroenterological diseases using a minimum number of sensors, while preserving the individual's privacy. We were particularly interested in people living in shared accommodation, to avoid the spread of disease. The system consists of a microphone and motion sensors in the living room and bathroom, plus a contact on the door to monitor entry and exit. A system that allows us to determine a person's coughing, sneezing or mobility," he assures us.
This system has been in place since 2022 in a 12-studio residence belonging to "âges sans frontières" and located in Brens, near Toulouse. "AI intervenes on two levels in this case. The first concerns sound recognition, where we use machine learning. The second, which we are currently developing, aims to exploit information concerning both sounds and movements, in order to generate alerts about a given person's state of health", concludes Dan Istrate. ■ **MSD**

Predicting and slowing down muscular ageing

Sofiane Boudaoud is a university professor and research scientist working with the C2MUST team at UTC-CNRS- BMBI. In particular, he is studying the assessment of muscle aging using AI tools in both basic and clinical research.

"It's a natural process that affects both the anatomy, architecture and physiology of the muscle, but also its capacities, particularly motor capacities. The neuromuscular system responsible for producing movement is also affected. Ageing is an inescapable process does not occur uniformly in all individuals. "In an article published in The Journal of Gerontology Series A, my colleague Professor Kiyoka Kinugawa, a neurogeriatrician at Charles-Foix Hospital and an expert in functional exploration in the elderly, demonstrated that a sedentary lifestyle induces accelerated muscle ageing by comparing the muscular characteristics of people with regular physical activity with those of sedentary people in the same age group. Sarcopenia, the ultimate stage of aging, is the antechamber to loss of mobility and falls", he explains.

The use of AI not only enables us to study the muscular aging process in greater detail, but also to detect risk-prone profiles and perhaps even anticipate the accelerated aging process. A thesis, as part of the Chronos project in collaboration with AP-HP, has been devoted to the prediction of aging by AI. "We use special algorithms the aim of which is to find the relationships between electromyographic signals measured on the surface of the muscle and age. We are currently finalizing an algorithm capable of predicting a person's age class by studying this electrical activity alone. Another of the team's projects concerns the development of a "digital twin" of aging muscle. This is a model that will mimic the muscle in all its behaviours, in a realistic, analytical and multi-scale way. In this case, we're going to train the AI to reproduce the behaviour of this "biofidelic" model to speed up simulations", assures Sofiane Boudaoud.

Other clinical projects with AP-HP are underway. "The first, HIPRESM, is a PhD project aimed at developing AI models to predict the ability of elderly people to recover from hip replacement surgery. The second, Chronos SARC, focuses on aging and sarcopenia. Prof. Kinugawa is the clinical investigator, and I am the scientific leader", adds Sofiane Boudaoud. ■ **MSD**

"Digital twins" for microcapsules

Anne-Virginie Salsac is a research director at the CNRS, in the Interactions Fluides Structures Biologiques (IFSB) team of the UTC-CNRS-BMBI laboratory. With Florian De Vuyst, she is developing "digital twins" of microcapsules under flow conditions.

In concrete terms? "A microcapsule consists of a membrane protecting a drop of an active fluid, like a drug. Like red blood cells, it enables the fluid to be delivered directly to the tissues, while avoiding side effects for the patient. Currently, therapeutic solutions on the market are nanoscale: their advantage (and disadvantage) is that they can cross all barriers, but the quantity of drug encapsulated is infinitesimal", she explains.

Hence the idea, as part of the Multiphys Microcaps project funded by the European Research Council, to develop larger, micrometre-sized vectors. "However, to ensure that the vectors are safe and can pass through capillaries or even smaller pores, we need to be sure of their deformability and resistance to blood flow. We are therefore developing numerical models that enable us to study their behaviour under flow and identify their mechanical properties by coupling them to micro-experiments. One of the quantities we need to estimate is their risk of rupture", she explains. This is a multi-physics problem requiring complex simulations. "We need to model the dynamics of the vector with its liquid core and thin membrane with non-linear mechanical properties, all interacting with the external fluid. The only way to do this is to develop our own high-fidelity digital codes. Being explicit, simulations are time-consuming, which led us to create digital twins. Having a large amount of simulation data at our disposal, we chose the "reduced-order models" approach, which can be seen as physics-based AI. Their interest lies in providing us with small-scale algebraic systems, which can reduce part of the high-fidelity codes, or indeed the codes in their entirety. Their other interests are to reduce calculation times and improve understanding of the elements driving fluid-structure coupling", stresses Anne-Virginie Salsac.

What is the next step? "We're going to bring our model reduction tools into a form of dialogue with more traditional AI tools. This is the aim of Lucas Wicher's thesis, which I am co-directing with Florian De Vuyst, co-financed by the Hauts-de-France Region and the UTC Safe-IA Chair. The aim is to determine which AI tools guarantee robust, safe and reliable digital twins", she concludes. ■ **MSD**

Patient-specific models coupled with AI for facial reconstruction

Professor Marie-Christine Ho Ba Tho coordinates, for UTC the FIGURES team led by Professor Devauchelle of the Amiens University Hospital, which performed the world's first face transplant in 2005.

Pioneers of patient-specific models, the team of Marie-Christine Ho Ba Tho aims to create the conditions for optimal facial rehabilitation following a transplant or facial paralysis, working with Stéphanie Dakpé, maxillofacial surgeon. "The clinical team has observed a lack of understanding of facial expressions. It is difficult to grasp the role of the facial muscles, of which there are almost twenty, which are activated according to face movements", she explains.

How can we help them solve this problem? "With our expertise, we modelled the face using the finite element method, using the subject's geometric and physical data to simulate facial expressions. We still had to define the facial movements in the case of facial reconstruction/rehabilitation," explains Marie-Christine Ho Ba Tho.

To outline a solution, she made the decision – a world first – to combine finite element modelling of the face with deep learning. "The former enabled us to virtually reconstruct the face and to simulate the functioning of the muscles and their role in the case a smile, for example, or even pronunciations such as the 'O' or the 'Pou' used for facial rehabilitation. The second is that of deep, generative learning. This involves teaching an agent to make sequential decisions while interacting with an environment. The agent will be the patient's face and the environment the finite element model. Following a face transplant or facial paralysis, we ar faced with the question of simulating the muscles to be activated to achieve the desired result, such as restoring a smile or a symmetrical face in the case of facial paralysis," she says.

Finally, the third stage consists of developing complementary tools to refine the model by superimposing the texture of the patient's face using cameras. A start-up is being created for this purpose with Professor Dao. "We have thus developed a tool that uses a patient-specific model coupled with AI to suggest muscle actions leading to the desired result. We tested it on the case of an asymmetrical face and validated it by comparing its muscle recommendations for performing a particular movement with those of the finite element model. With this digital tool, we have in short achieved a "proof of concept"," concludes Marie-Christine Ho Ba Tho. ■ **MSD**

Improving the diagnosis and treatment of biliary diseases

Isabelle Claude is a lecturer specialist in medical image processing, particularly in multi-modality image segmentation, currently working on the MAAGIE project funded by the ANR, the aim of which is to improve the diagnosis and treatment of biliary diseases.

Isabelle Claude works with magnetic resonance imaging as well as computed tomography and ultrasonics. This leads her, depending on the clinical request submitted to her, to develop specific tools.

Launched in January 2025 for a period of four years, MAAGIE brings together three laboratories: UTC-BMBI, ISIR and LIP6 of Sorbonne University and two AP-HP hospitals, Saint-Antoine Hospital in Paris and Henri-Mondor Hospital in Créteil. The aim of the project is to improve the diagnosis and treatment of lithiasic and tumorous diseases of the bile ducts, both of which prevent bile from flowing, with potentially dramatic consequences for the patient.

The idea behind this project? "It's about giving gastroenterologists the benefit of the latest technological developments in both robotics and digital technology, as has been the case in the vascular and cardiac fields. The aim is to improve the success rate of endoscopic retrograde cholangiopancreatography (ERCP). A complicated intervention since it involves inserting an endoscope through the patient's mouth, passing it through the stomach, then finding the papilla, an opening in the duodenum through which instruments are inserted. These will be passed up into the bile ducts either to remove stones or to insert stents," explains Isabelle Claude. This double endoluminal access causes 5 to 10% of the procedure to fail.

What are the solutions to reduce this failure rate? As part of his thesis, Abdelhadi Essamlali adapted a U-Net model, a tool based on convolutional neural networks, to the problem of image segmentation and then 3D reconstruction of the biliary tree. A tool validated by clinical partners. "The first step is to reconstruct the bile ducts in 3D using 2D images (MRI, scanner) of the patient before the operation. This allows the practitioner to better follow the patient's anatomy and thus better plan the ERCP. Then, in the preoperative phase, the 3D reconstruction is merged with the planar fluoroscopy images to help the surgeon find the right duct to treat," concludes Isabelle Claude. ■ **MSD**

Preventing falls through deep generative learning

Karim El Kirat, a university professor, is co-head, with Sofiane Boudaoud, of the C2MUST team at UTC-CNRS-BMBI. He develops multi-scale models for fall prevention, using AI in particular.

It was with Tuan Dao, then a member of UTC-BMBI and an AI specialist, that Karim El Kirat began working on multi-scale models at the molecular level. Since then, Tuan Dao has joined the Ecole Centrale de Lille as a professor, but their collaboration has continued on multi-scale modelling of the whole body. "The biomechanics of the human body integrates different aspects. We are interested in the musculoskeletal system, namely the muscles, bones and tendons. The objective is to define the role of the different elements during a movement, for example. The bone is the foundation of the system, the tendons are springs of a sort, while the muscles are actuators. The question is: who controls all this and how does it work? When we do multi-scale modelling, we simultaneously analyse how the muscle will contract at different scales to produce movement on the human scale, and how nerve impulses participate in all this," explains Karim El Kirat.

The two research scientists were particularly interested in the problem of falling. "When we're small, we learn to walk by falling over, getting up and continuing to walk, or so we think, for life. However, sarcopenia, the infiltration of fat into the muscle that lowers muscle strength, can begin as early as the age of 40, leading to an increasing risk of falling with age, especially for sedentary subjects. Thus, in the modelling, it was decided to use a biomimetic AI that mimics the process of learning to walk. A model based on a specific AI was developed: generative deep learning. A biomechanical model of the whole body is created, integrating the mechanical properties of bone, muscle and tendon. The model is then asked to take a few steps and to fall. The model is rewarded if it achieves the objectives (falling, or not) and it is thus possible to analyse which parts of the body, which stages of walking are decisive if we want to avoid falling. The model is trained using the data available in our database but also data from the literature in order to ultimately propose preventive musculoskeletal strengthening routines," he concludes. ■ **MSD**

INTERNATIONAL RELATIONS

UTC declared laureate of the 5th call for projects of European universities

To support the implementation of an ambitious action plan to strengthen research, teaching, innovation and partnerships with the local, European and international socio-economic world - is the ambition of the Sunrise alliance, which also strengthens UTC's influence in its region.

The European Union has selected 14 new European university alliances following the 5th and final dedicated Erasmus+ call for proposals. UTC and its 8 partners have won the SUNRISE Alliance, Smaller Universities Network for Regional Innovative and Sustainable Evolution. France is one of thirteen higher education institutions among the 130 European winners of this call. In this context, the Alliance has been awarded 14.4 million euros over four years. This funding will support the implementation of an ambitious action plan aimed at strengthening research, teaching, innovation and partnerships with the local, European and international socio-economic world. "The stakes of this Alliance project are high. SUNRISE is an alliance of European universities that will enable us to highlight the role and actions of small universities, which occupy a very important place, working for development, innovation and sustainability, at the heart of European regions and in particular with industrial companies based in their territories", assures Claire Rossi, President, Vice-Chancellor and Director of UTC. "Through this new European university Alliance, UTC intends to further strengthen its impact at the heart of the Hauts-de-France Region."

An alliance of smaller universities working at the heart of their territories

The SUNRISE Alliance promotes collaboration between academia and industry to develop symbiotic models with regionally based industrial companies. It also focuses on international education, promoting the introduction of innovative curricula and encouraging student mobility. "These elements have been hallmarks of UTC's identity since it was established in 1972. Indeed, universities of technology have the particularity of being located in medium-sized towns, yet are visible and attractive on a national and international level. Moreover, the training and research carried out at UTC are resolutely focused on innovation and the development of responsible technologies to meet the major contemporary challenges facing society and business", the President adds. Small universities, located in the heart of medium-sized towns and cities, face major challenges, such as the loss of talent or a lower level of attractiveness than universities located in large cities, with limited resources and competition from larger institutions. But they do play a major role in the attractiveness of their regions, and form an essential link between academia and Society, in direct proximity to the socio-economic environment of their territories. "The common goal of the SUNRISE partners is to be seen as major players in the transformation of our regions, to make them more attractive and competitive, and above all to work alongside other local players in meeting the challenges facing us, particularly those of the triple transition - environmental, societal and digital", concludes Joanna Daaboul, lecturer and director of International Relations at UTC, who, like the other members of the alliance, is committed to leading this network of European universities as coordinator of the project for UTC. ■ **KD**

THE SUNRISE ALLIANCE PARTNERS ARE :

- Ilmenau University of Technology, Germany (Alliance Coordinator)
- Université de technologie de Compiègne, France
- the Free University of Bozen-Bolzano, Italy
- the University of Information Technology and Management in Rzeszów, Poland
- the European University Cyprus, Cyprus
- Mälardalen University, Sweden
- Università Politecnica delle Marche, Italy
- « Džemal Bijedić » University of Mostar, Bosnie-Herzégovine
- the Polytechnic University of Viana do Castelo, Portugal

Cranfield University, one of UTC's historic and strategic partners is also an associate membre of the Sunrise Alliance.

The Polytechnic University of Tiraná and UTC have been in a partnership since 2008

A strong partnership between UTC and UPT-Tiraná began in 2008. Over the years, there has been a high level of student mobility from UPT to UTC, on average two per year, at the initiative of Professor Dritan Nace.

An initial double degree agreement for a Master's degree in computer science and electronics was concluded in 2019. It allows Albanian UPT students enrolled in a Master's degree in Computer Engineering or Electronic Engineering to continue the second year of their Master's degree at UTC. "Since 2019, we have been welcomed five students every year at UTC on a double Master's degree (Erasmus+ project funding). These students have an excellent academic level and are achieving remarkable results at UTC. In 2022, the collaboration continued with a second agreement for a relocated double Master's degree, where, this time, UTC and its teachers deliver the Master's courses on the premises of UPT. This course, which includes a semester of work experience, was inaugurated by President Claire Rossi in October 2023 in Tirana. There were 14 students recruited for this course in its first year. This year, there are 25 Albanian students who will graduate at the end of the 2024-2025 academic year," emphasizes Joanna Daaboul, Director of International Relations at UTC.

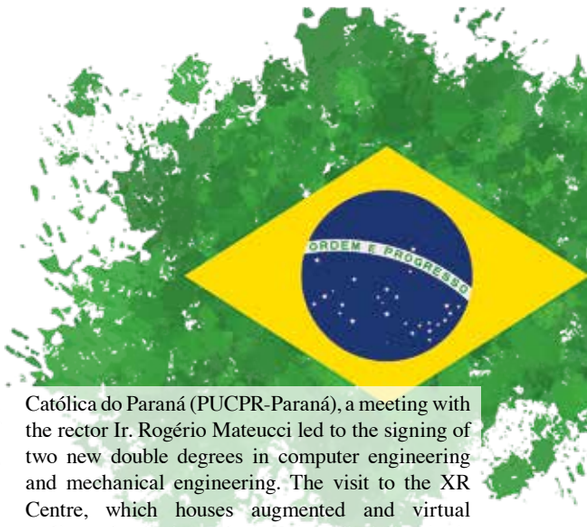
Transfer of the innovative model from UTC to UPT-Tirana

Among the many projects in progress is the UTEAM/UTC-UPT cooperation project designed to help UPT set up a structure for managing industrial relations. “The aim of this project is to pass on UTC's know-how, via UTEAM, in the creation and management of centres for the promotion of research and a university's relations with the industrial world. We also have plans to set up a branch of UTC in Tiraná, on the UPT premises, with the introduction of a Bachelor's degree in engineering to complement the existing Master's degree, announces Joanna Daaboul. This will mark the culmination of the collaboration. The broad outlines of the project will follow the model of UTSEUS, the Sino-French university of engineering in Shanghai, founded in 2005, shared by the universities of technology (UTBM, UTC, UTT) and the University of Shanghai.” ■ **KD**

MINISTERIAL VISIT TO UTC

Ogerta Manastirliu, the Albanian Minister of Education and Sport, visited UTC on November 15, 2024. This event marked a significant step in the development of academic and institutional relations between UTC, the Polytechnic University of Tiraná (UPT) and the Albanian government. During her visit, the Minister had the opportunity to discover the facilities of the UTC and to meet Prof. Claire Rossi, President, Vice Chancellor and Director, as well as several members of the teaching staff. Among the personalities present were Dritan Tola, Albanian Ambassador to France and Valbona Nano, representative of the French Embassy in Tirana and the rector of UPT-Tirana, Dr. Akli Fundo. It provided an excellent opportunity to discuss international partnerships focused on interdisciplinarity and the strengthening of links between pedagogy, research and the socio-economic world, but also to sign a letter of commitment and intent, formalizing the joint desire to create a campus of UTC in Tirana. This ambitious project aims to strengthen academic exchanges and offer new learning opportunities to Albanian and French students, while promoting international cooperation in the field of education and research.

40 years of partnership with Brazil



Last December, a delegation from UTC made a memorable visit to Brazil, in the state of Paraná. A chance to celebrate the collaboration and define projects for the future.

Prof. Claire Rossi, accompanied by Joanna Daaboul, Director of International Relations, Pierre-Henri Dejean, emeritus lecturer-cum-research scientist at the UTC-Roberval laboratory, Pascal Alberti, lecturer-cum-research scientist at the COSTECH laboratory, Gilles Morel, lecturer-cum-research scientist at the AVENUES laboratory, and Max Schaegger, former professor and DRI of UTC, paid a visit to several partners in Brazil from December 1 to 6, 2024, on the occasion of the celebration of 40 years of collaboration between UTC and the State of Paraná. The visit began with the signing of a strategic agreement with the Araucária Foundation, aimed at offering financial support to Brazilian students, doctoral students and post-doctoral students wishing to study at UTC. The meeting with Ramiro Wahrhaftig, president of the foundation, proved to be extremely rewarding. “UTC has played an undeniable role in the development of the higher education landscape in the state of Paraná. Courses have been created with UTC, and the current teaching team includes many UTC alumni,” recalls Joanna Daaboul.

UTFPR- Paraná (Universidade Tecnológica Federal do Paraná) has evolved according to the UTC model

The delegation also visited three partner universities, notably with the rector Everton Lozano of the Universidade Tecnológica Federal do Paraná (UTFPR) to discuss future collaboration projects and sign a new framework agreement paving the way for new collaborations in teaching, research and innovation with the rector Ricardo Alexander Marcelo Fonseca. UTC and UFPR- Paraná have been partners for 40 years, but this partnership goes beyond collaboration between institutions. It is also based on UTC alumni who are pioneers of innovation at UFPR and founders of departments, such as Professor Carlos Ricardo Soccol. In 1997, he founded the Department of Bioprocess Engineering and Biotechnology and the School of Bioprocess Engineering and Biotechnology (EBB). EBB's achievements include more than 600 journal articles, 38 books, 220 book chapters and around 150 patent claims (40 of which have been granted). Around 40% of its professors are among the top 2% of scientists in the world. “This collaboration is testimony to UTC's innovative vision since its inception in 1972, when it was affirmed that science and pedagogy have no frontiers, and even though we were a young university, because at the time we had only been in existence for 12 years, we dared to create strong international collaborations,” adds Joanna Daaboul. Today, UTC aspires to remain an inspiring model with a vision that is not limited by international borders.”

Drawing up a roadmap for the next 10 years

The first exchange student at UTC from the state of Paraná comes from UFPR. His name is Robson Rocha, and he is now an executive at Renault Curitiba. UTC and UFPR- Paraná share a vision to become key players in environmental transition. In this context, the delegation was able to visit the sustainable energy research and development centre, which includes technologies based on microalgae and innovations in bioenergy. This centre is coordinated by Professor José Viriato Coelho Vargas. The delegation also explored the innovative technology platforms of the “ecoville” campus. During the visit to the Pontificia Universidade Católica do Paraná (PUCPR-Paraná), a meeting with the rector Ir. Rogério Mateucci led to the signing of two new double degrees in computer engineering and mechanical engineering. The visit to the XR Centre, which houses augmented and virtual reality technologies and where interdisciplinarity is emphasized by all the projects requiring expertise in art, engineering and pedagogy, was enriching, as was the visit to the Hotmilk centre, which hosts companies and start-ups and supports students in their entrepreneurial endeavours. Prof. Claire Rossi was able to visit the Renault factory in Curitiba and on this occasion meet Consul General Alexandra Mias, as well as Carlos Sérgio Asinelli and Germano Ferraz Paciornik, representatives of the Chamber of Commerce. A moment of sharing bringing together all UTC alumni, now executives in this factory, provided an opportunity to discuss possible new collaborations with Renault, an important industrial partner of UTC. The visit ended with a gala to celebrate 40 years of collaboration with the State of Paraná, to which all UTC alumni present on site were invited, as well as several dignitaries. ■ **KD**

INTERNATIONAL MOBILITY

On the occasion of the celebrations of four decades of cooperation between Paraná and UTC in France, the Araucária Foundation formalised a cooperation agreement for international mobility through the program #GanhandooMundodaCiência! There will be 50 places available: 46 for undergraduate students, 2 for doctoral students and 2 for post-doctoral researchers. The mobility programs will last up to six months, with an additional month devoted to immersion in the French language.

A NOTEWORTHY EVENT

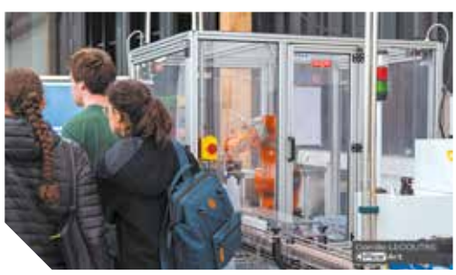
Immersion visits to UTC's laboratories during the Research Nights

We enjoyed a fine success with this year's new version fo the "Research Nights" which took place November 18-27, 2024, over 10 years after the previous similar event was held at UTC. **The objective: to bring the student community closer to the cutting-edge technological research carried out in the eight UTC laboratories.**

This most recent edition of "Research Nights", held last November, was a great success with students, thanks in particular to the guided tours that gave them an insight into the work of the lecturer-cum-research scientists and engineers who train them on a daily basis. "This first edition of the new Research Nights format was a success with engineering and Master's students and it emphasised their interest in research carried out in UTC's research laboratories. It provides a good showcase for the research work that is carried out mainly as part of doctoral studies and it allows students to get a first-hand experience of what doctoral work is all about. This helps them to better envisage a possible continuation of their studies with a doctorate," says Christine Prelle, director of the Doctoral PhD School, who was present at each evening's event and was able to answer students' questions about doctoral studies. This was an opportunity to invite students to sign up for the new inter-semester educational activity, API DOC, to extend their understanding of what a doctorate entails, through awareness-raising of research methods and immersion in laboratories in pairs with a doctoral student. The API DOC took place in January. "There are a few adjustments to be made for the next edition of Research Nights, but the idea will remain the same: to make research carried out at UTC better known to our students and, who knows, to trigger some vocations for research work and careers!"

An event labelled "Industry Week"

The aim of these Research Nights was therefore to bring the student community closer to research, under the leadership of Prof. Claire Rossi, director of UTC, and thanks to collaborative work involving a student who was the driving force behind the project, Florian Miousset, the research department headed by Frédéric Lamarque, the Doctoral PhD School, the communications department, as well as the eight directors of the eight UTC research units. Over the course of six evenings, the students were able to enter the heart of UTC's laboratories of excellence, which are TIMR, Avenues, BMBI & GEC, Heudiasyc & LMAC, Costech and Roberval. Each research unit welcomed between 40 and 50 visitors. This event labelled "Industry Week", received a total of more than 170 students, in the presence of SATT Lutech, a facilitator for the transfer of research to industry. "In December 2023, during a meeting with Professor Rossi, I asked her if it was possible to relaunch this event, in a new and more sustainable format. She immediatel²y supported me in this project. Frédéric Lamarque, research director, and Christine Prelle, director of the graduate school, then helped to bring it all to fruition. My role was above all to develop, with the UTC communications department, materials to promote the event, posters, posts on social networks, registration website, banner on the legendary footbridge of the Benjamin Franklin centre, newsletter, wallpaper on all UTC PCs," explains Florian Miousset, computer engineering student and linchpin of the project.



Breaking down the barriers between the two worlds

More than 90 members of UTC's eight laboratories were involved: doctoral students, research professors, research engineers, etc. "This enthusiasm for the event reflects the desire of students to learn more about the research carried out at UTC, and the willingness of research staff to share their work with their students. Research of excellence is taking place right next to our classrooms: it seems important to me to take an interest in it, to be proud of it and to make it shine", adds the student for whom one of the most important issues is to strengthen the link between UTC research and the student community, to arouse curiosity. "Countless projects are carried out right next to our lecture halls, but we know very little about them. The "Research Nights" help to break down the barriers between these two worlds. By learning more about what goes on in the laboratories related to your field, you gain a better understanding of the area in which you will be working. This can then create links between our future company and the laboratories, to develop ever more innovative and ambitious projects that showcase French research." For the next edition, the idea is to welcome even more students, but also researchers from other laboratories or administrative staff from UTC. "It would be interesting to showcase other research projects. This could help to make research even more interdisciplinary in order to carry out large-scale projects, Florian Miousset envisages. We could even dream of opening this event to the general public! This could complement the Fête de la Science, which is organized every year and which UTC launched in 1992." ■ **KD**

> ***"Many projects are carried out right next to our lecture halls, but we know too little about them."***

STUDENT LIFE

There are some really excellent ideas in the participatory budget !

In the beginning, the Bissap project, a drink made from hibiscus flowers, was an initiative for the benefit of the student community and one of its associations, the "Pic'asso". A great idea launched thanks to the participatory budget, an envelope financed by funds from the contribution for student and campus life (CVEC) and voted by the students elected to the Council for Studies and University Life. This fund makes it possible to realize student projects aimed at improving the daily life of UTC students on their campus. On the strength of this, with the support of the entrepreneurship division of the department of socio-economic partnerships and entrepreneurship (DPSEE) at UTC, Bissap, renamed "Sir Roselle ", won a prize last February in the Pépite Sorbonne Université's call for projects, which enables students to test, boost and finance a entrepreneurial project. An adventure, with a success story as a backdrop, which must now move on to the manufacturing and marketing stage.

Ruddy Moussahou, a UTC undergraduate student (second year mechanical engineering) IM02, can savour the success of his madeleine de Proust: bissap, a juice made from hibiscus flowers that evokes his youth and his Congolese origins. "I often drank it in Africa and I wanted to introduce others to my mother's recipe," the student emphasizes. Because the Bissap project, now called Sir Roselle, an ambition initially supported by the Student Life Office (BVE), acclaimed by students during the 2022-2023 participatory budget and now supported by the entrepreneurship division of the Directorate of Socio-Economic Partnerships and Entrepreneurship (DPSEE), is taking advantage of the motivation of an entire team to outsource the marketing of this drink beyond the walls of UTC. Especially since "the idea of starting a business has been on my mind since I arrived in France in 2020," says the young student-entrepreneur and logistics and production manager of the project. With Samuel Monji and Inès Abbache, both computer engineering students and respectively finance and partnership manager and communication and marketing manager, he devotes his energy to "offering a drink with multiple therapeutic benefits: antioxidant, reduction of high blood pressure, regulation of blood sugar, etc.".

Prototyping stage

The winners in February of the call for projects from Pépite Sorbonne University and the Île-de-France region received €3 000 in funding to test, boost and finance their project via the UTC entrepreneurship centre. "To finalize a prototype of the still artisanal product by April," says Samuel Monji. We have to work on the bottle, the logo, the label and formalize the recipe in order to reinforce its identity. The purchase of equipment, the placing of orders and the search for additional funding are underway, particularly with a view to industrialization. Discussions with the Carrefour chain in Venette could make it possible to distribute the product and make it known.

"UTC, a solid foundation"

For Ruddy Moussahou, the participatory budget was "an opportunity to test the ability to lead a project, a learning experience for its management and the management of a team". Present from the start, UTC is for the trio, "an essential support that provides access to the expertise of lecturers and the many technical, biology and design centres... We were supported by the BVE (educational and vocational guidance service) but also by Mirian Kubo, head of the Food Innovation and Agri-Resources department, and then by the Department of socio-economic partnerships and entrepreneurship (DPSEE). It is also thanks to UTC that we came into contact with Pépite Sorbonne Université. For the future, UTC is a solid base."

Véloc, another success story

For its part, the Véloc association facilitates student mobility by renting them at a low cost "130 bicycles acquired, collected and refurbished and with the necessary safety equipment such as helmets and locks. A cargo bike has also been purchased," says François Pons, former president of the association in his third year of mechanical engineering, who has now handed over the reins in order to 'infuse new energy and enable everyone to get involved in this project, which is part of the 2021-2022 participatory budget'. Véloc also provides free self-repair for two-wheelers during the office hours provided by around twenty volunteers at its premises, equipped with the necessary tools, parts and equipment, as well as two self-service terminals accessible to all. "The first, installed near the Benjamin Franklin building, quickly proved to be very popular," says François Pons, who developed the idea of the second terminal installed at the Pierre Guillaumat centre" to benefit a wider audience because more and more people are using bicycles for everyday travel. We also have a demand from lecturers. It's really quick and convenient for the journey between our two campuses. This infrastructure, which promotes sustainable transportation, will be part of UTC's Soft Mobility programme, supported by the Haut-de-France region and the Greater Compiègne authorities (ARC). Good news for enthusiasts who are waiting to get in the saddle: the association's project to acquire new equipment has once again been approved this year in the 2024-2025 participatory budget in order to meet growing demand. That is what we call success ! ■ **IL**

BOOSTING INITIATIVES

Supported since 2021 by students elected to the Council for Studies and University Life (CEVU) from the contribution for student life and campus (CVEC), the participatory budget makes it possible to develop participatory democracy by putting ideas into practice. A budget of 15 000 euros is dedicated to this. Reception, social and health support, culture, sport, prevention and health education are all areas in which students invest, either alone or in groups. After submission, eligibility and feasibility study of the projects, the students' vote is decisive. This year, five projects are supported until completion. Other actions selected include the development of a tavern to improve the welcome and comfort of the Pic'asso, the installation of a safe zone for help and assistance to witnesses and victims, a reduction in the price of first aid training to make it accessible to as many people as possible, and the provision of new furniture at the foyer - Maison des étudiants. "They meet the needs of as many people as possible," says Laëtitia Bouet, project manager for student life. "The initiators then contact the service providers, in charge of managing and monitoring the projects. It's part of their training. This one didn't actually work out, but we reassessed the project to install green plants to brighten up the corridors."

WHEN EXCELLENCE CALLS

UTC sport élite, a path combining engineering studies with high level sports achievements

Théo Masse and Paul Fortin, **two "sports elite" students at the top of their game.**

En route to the Solitaire du Figaro 2027

Théo Masse, 21, is a mechanical engineering student at UTC, specialising in materials and technological innovations. He also has a passion for sailing, with eight French championship titles and five World Cup podium finishes already under his belt.

Théo Masse was admitted to UTC after gaining a scientific baccalauréate (maths-physics) and a DUT in materials science and engineering. Currently on placement with CDK Technologies in Brittany, a company specialising in the construction of racing yachts taking part in the Vendée Globe, the 21-year-old student's career plan is to work in the field of ocean racing such as the Vendée Globe, combining his engineering skills with his passion for sailing. 'I'm preparing to become an engineer specialised in structural calculations, to link my knowledge with boat performance. At the same time, from a sporting point of view, my aim is to take part in the single-handed Solitaire du Figaro race in 2027, hoping to make a living from sailing and my passion,' says the sportsman whose love of sailing began at the age of 8, thanks to school sailing. 'I started competing in Loguivy-de-la-Mer in northern Brittany, with the Loguivy Canot Club (LCC). From my very first years in the Optimist, a tiny single-handed boat, I discovered the excitement of regattas and the spirit of camaraderie that made me want to excel in this sport.

An already impressive list of achievements

Théo Masse has won eight French championships in various disciplines since he started out in Optimist, as well as winning the Tour de France à la Voile in 2023, and two victories and five podium finishes in the Match Racing World Cup. In 2025, the future engineer plans to concentrate on his transition to the Figaro class alongside his TN09 (six-month assistant engineer placement), taking part in training races and preparatory regattas. 'After my TN09 in the A25, I'll be aiming for the match-racing world championships, a discipline I've been practising for three years now,' adds the man whose life is a perfect balance between his studies at UTC and his intensive sailing. 'I organise my weeks between classes at UTC, every other week, alternating courses, school projects and physical preparation. I mainly train in the Mediterranean or on waters close to the competition venues. My organisation is based on good planning to maximise my working time and my sporting performance.

Advanced studies, sports elite and values

Théo Masse appreciates more than anything the combination of strategy, technique and surpassing oneself. He loves the precision needed to optimise each setting, as well as the adaptability required to cope with the natural elements. 'This sport conveys values that are close to my heart: helping others, humility in the face of the ocean and respect for the environment. UTC also offers him the opportunity to combine a demanding course with high-level sports. 'The support given to student athletes allows me to pursue my objectives without compromising my academic progress. Being open to innovation and technology also motivates me, as it ties in with my interest in design and performance, particularly in the naval sector.

Los Angeles at the point of the sword

Paul Fortin is in the first semester of his mechanical engineering degree at UTC. He has been fencing since the age of 10 and has set his sights on taking part in the Los Angeles Olympic Games in 2028.

Paul Fortin has not yet chosen his major, but he is particularly interested in materials and simulation. His career plan is to work in sports equipment design. This would enable him to combine his love of sport with his skills in helping sportspeople to improve their performance. 'I started fencing when I was 10, my brother was already doing this and, as I wanted to do everything like him, so I joined him. Since then, he's stopped and I've carried on,' laughs the 22-year-old fencer, who took part in the Qatar Grand Prix Épée in Doha last January. He represented France at the event, but unfortunately didn't finish on the podium. His goal is to take part in the European U23 Championships in April, as well as the World University Championships in Germany in July 2025. 'For the moment, my best performances are 3rd place in the Junior World Championships with the French team, plus selection for the European and World Championships in the youth category. Recently, I joined the French senior national top 12 who will be going on to international competitions', sums up Paul Fortin, who had applied for a one-year gap year at UTC, which was renewed for a further year.

An intense pace with the LA 2028 Olympics in his sights

This gap year enabled him to go to an American university where he obtained his bachelor's degree in economics. 'It also allowed me to train every day and improve my sport. I also did very well there, making it into the top eight epeeists in the United States. The Olympics are also in the back of her mind, but there's still a long way to go and many challenges still lie ahead. 'In Paris, I do my physical preparation and have individual lessons with my private coach. I stay in Paris in the evening to do an 'assault' session. I then take the last train back to Compiègne. I do this about three times a week. The rest of the week, I do a bit of physical preparation and some basic fencing moves in the special room or salle d'armes, in Compiègne', sums up Paul Fortin, who finds in his discipline the values of respect and cohesion that can be developed just as much with his team-mates as with his fellow students at the UTC. ■ **KD**

Delving into the history of babies during birth

Nathalie Sage-Pranchère is a historian and CNRS researcher at the SPHERE laboratory. She was one of the speakers on the round table at 7th Biomedical Rendez-vous at UTC. Her research focuses on the social history of healthcare in the contemporary era, with a particular emphasis on the history of perinatal care, foetal and neonatal illnesses and, more broadly, the history of the healthcare professions. Let the readers appreciate meeting her!

The Biomedical Rendez-vous at UTC brings together key players in the development of medical practices, placing at the heart of the debate the aim of biomedical engineering: to improve the way patients deal with and experience diseases, by facilitating medical action in all its forms (diagnosis, screening, treatment, recovery). Nathalie Sage-Pranchère was therefore keen to be present. Her forthcoming book will look at the history of rhesus incompatibility disease, from the first observations in the late 19th Century to an understanding of the origin of the disease with the discovery of the rhesus factor in the early 1940s. 'This exploration of the past allows us to take a fresh look at periods and contexts that defy our contemporary evidence (asepsis is a recent 'invention' ; maternity wards were for a long time places of assistance and antechambers of abandonment, etc.). It sheds light on the roots of certain current practices (the strict supervision of pregnancies) or certain professional positions (the medical status of midwives)', explains the researcher, whose assiduous attendance at paediatric surgical services in childhood fuelled a deep-seated curiosity for the medical world. 'What's more, my discovery of the contemporary issues surrounding perinatal care, the management of female reproductive health and child health has reinforced this interest. Today, my research inevitably brings me face to face with the question of the link between technology and the human beings, whether in my objects of study or in those I use to produce them and make them known. The way I look at it is through a use-based approach, taking care never to see technology as an end in itself.

Humanising medicine and patient safety

The history of the newborn is marked by a major turning point in the second half of the 18th Century, when policies began to be implemented throughout Europe to improve birth conditions and reduce maternal and neonatal mortality, primarily through the training of midwives. The first resuscitation practices for newborn babies were developed at the same time. 'The physical survival of the newborn became as precious as its spiritual survival, which had previously been central in almost unanimously Christian societies. This development was at the root of all the changes that followed: care for premature babies from the 1880s onwards with the invention of the incubator, the development of maternal and child protection, the emergence of cutting-edge foetal medicine with the development of increasingly sophisticated imaging techniques from the 1970s-1980s, and so on. 'According to the historian, progress that is still possible in terms of infant mortality is certainly based on technical advances, but above all on public policies that pay attention to the living and working conditions of pregnant women, as well as to the quality and accessibility of medical resources for monitoring pregnancy and childbirth. 'All this implies a sufficient number of healthcare professionals, substantial investment in healthcare institutions, and a non-accounting approach to medical support. The humanisation of medicine, which is absolutely compatible with patient safety, also requires healthcare professionals to receive more training in the human and social sciences, so that they can approach patients as people rather than as potential disease sites. ■ **KD**

THREE QUESTIONS

PR LAURENT SALOMON, OBSTETRIC GYNAECOLOGIST AT THE MATERNITY UNIT OF THE HÔPITAL NECKER-ENFANTS MALADES IN PARIS (SPECIALIZED IN SICK CHILDREN)

Have we discovered everything there is to know about foetal medicine and surgery?

Foetal medicine and surgery are constantly evolving. Although major advances have been made, we are still far from having discovered everything. One of the pillars of this development is medical imaging, which plays a key role in the detection and diagnosis of antenatal pathologies and serves as a support for possible interventions in utero. In the future, we can look forward to innovations combining artificial intelligence and advanced imaging to further refine diagnoses and optimise interventions. For example, machine learning algorithms are already helping to improve image quality and the detection of structural and functional anomalies in prenatal imaging. In addition, the integration of augmented reality and 3D modelling from MRI and ultrasound scans could give both parents and doctors a better view of foetal organs and certain anomalies.

How do you feel about events between biomedical engineering professionals and students, such as we see at the UTC biomedical meetings?

These events are essential for building bridges between academic research, technological innovation and medical practice. They give biomedical engineering students the opportunity to talk directly to professionals in the sector, to gain a better understanding of the practical challenges in the field and to gear up their work to the real needs of clinicians. For our part, as researchers and practitioners, these meetings give us the opportunity to discover the new generations of engineers who are coming up with innovative solutions. The UTC Biomedical meeting is a perfect illustration of this synergy, promoting a multidisciplinary approach where medicine and technology move forward together.

What's the most beautiful thing about your profession?

The most fascinating thing about our field is the possibility of transforming the lives of families and patients, sometimes as early as their intra-uterine development. Seeing a child born and developing in good health thanks to screening, with a diagnosis and sometimes an intervention carried out while they were still in utero is an incredible and deeply motivating experience. The link between technology and the human being is inseparable in modern medicine. Technological innovation may enable us to go ever further in providing care, but it must never replace the human dimension of the patient-caregiver relationship. The aim is to use technology as a lever in the service of life but not as an end in itself. The balance between these two dimensions is fundamental: it is by putting people at the heart of innovation that we will succeed in developing medicine that is ever more ethical, precise and accessible! ■ **KD**

RESEARCH / SOCIETY

Encouraging Biomedical Innovation

UTC's Biomedical Rendez-vous took place on January 24, 2025 at the UTC Daniel Thomas Innovation Centre. The theme of the 7th edition was high-risk pregnancies and neonatal care. This event, which has become a "must", aims to maintain a strong link between students in training and the entire biomedical community: industrial partners, health establishments and academic research scientists and engineers.

UTC's Biomedical Rendez-vous gives everyone the opportunity to discuss the latest technological and organisational innovations and current research projects. It also pursues the UTC's original positioning by questioning the changes brought about in particular by the human sciences: ethical questions, historical perspective, adaptable rights and the place of regulation. Lastly, it highlights student initiatives and the project-based teaching method so dear to UTC by including a poster session to present the work. 'The quality of the plenary sessions on a difficult subject, high-risk pregnancies and prematurity, was strikingly high and enabled a wide audience to understand the issues and the impact of innovations on patient care, as well as the difficulty for the medical profession, not having all the answers despite the power and constant evolution of the tools available to them. Finally, the round-table discussions also highlighted the changing place of the new-born baby in our Society, the historical weight of religions and the constant need to strike a balance between human input and a techno-centric vision of patient care', say Isabelle Claude and Jean-Matthieu Prot, lecturer-research scientists at the UTC-CNRS-BMBI laboratory, who defined this theme during a discussion with the organising committee, which includes scientific leaders and students. 'We're trying to strike the right balance between the various players and the subjects that are topical in the sector. The richness of the field offers a wide choice of issues to tackle and often sparks lively debate'.

INNOVATION AT THE SERVICE OF NEWBORN BABIES

During the round table on innovation at the service of newborn babies, which brought together Nathalie Sage-Pranchère, historian at the CNRS, Jean-Luc Vanhee, former R&D Director of Mediprema and Catherine Marque, Emeritus Professor at the BMBI laboratory, Professor Laurent Salomon, gynaecologist and obstetrician at the Hôpital Necker-enfants malades, talked about ultrasonics which remains the main tool for monitoring pregnancy, and which has made considerable progress with the constant improvement in image quality and the emergence of technologies such as 3D/4D ultrasound and advanced Doppler imaging. 'Today, it allows ever finer visualisation of foetal structures, facilitating early detection of anomalies. However, foetal MRI is taking on an important role, complementing (rather than replacing) ultrasonics, offering higher contrast resolution for certain cerebral, thoracic or abdominal pathologies, providing a functional approach to organs and overcoming certain technical limitations of ultrasonic imaging', explains the specialist, for whom the emergence of techniques such as functional imaging opens up new prospects in the assessment of the placenta and foetal cerebral activity. 'This could have a major impact on our understanding and management of growth disorders and neurological development from life in utero.

We try to strike the right balance between the various players and the subjects that are topical in the sector.

An eagerly awaited event

The UTC-CNRS-BMBI laboratory is the first financial supporter of each edition of the UTC Biomedical Rendezvous, which enables its researchers to be highlighted. 'It covers such a wide range of skills and themes that each year we can easily associate a field of research with the chosen theme,' says thematic curator Isabelle Claude, lecturer-cum-research scientist at UTC. Among the sources of satisfaction are the involvement of students in the running of the day and the practical workshops organised with the UTC's industrial partners, such as this year's contribution of simulation tools to staff training by the company Laerdal, which offers an amazing and "bluffing" degree of realism. Jean-Mathieu Prot, likewise thematic curator and a lecturer-cum-research scientist at UTC, concludes: 'The loyalty of our audience is another indication of the value of such an event, because we have set up a meeting place and many people follow us from a distance, we receive proposals for presentations or contacts from future students who are passionate about the subjects covered. The undeniable success of this great event is now being taken up by other flagship themes at the UTC, such as the RDV de l'IA!' ■ **KD**

INCLUSIVE POLICIES

Reassessing handicapped persons' needs

The doctoral school and the research department organised a Research and Disability Awareness Day on December 16, 2024. A day to understand and support disability.

The Research and Disability Awareness Day organised on December 19, 2024 in the Colcombet Lecture Hall at the Transfer Centre was the first event on this theme organised by the doctoral school and the research department. 'It's a first event, and there will be more to come. We welcomed colleagues from UTC and Sorbonne University. Their presentations focused on research themes that are themselves related to disability. For example, there was a talk entitled 'Hands-free crutches and reinforcement learning for walking exoskeletons' by Nicolas Perrin-Guilbert, from the ISIR laboratory at Sorbonne University and a talk by Irène Labbe-Lavigne, a doctoral student at UTC's Costech laboratory, on understanding disability through the prism of technology', explains Frédéric Lamarque, Director of Research at UTC. Anne Guénand, a lecturer-cum-research scientist at the Costech laboratory, also gave a presentation on the Bip Pop platform for collaborative mobility and her work as a researcher into new forms of civic engagement, in the firm belief that new forms of civic engagement are emerging today that will enable us to reconfigure the way we live together. After several years of development and action research in partnership with UTC and the Godin Institute, and after several experiments, the Bip Pop solution arrived in 2016. Today, we are present throughout France, working with local authorities wishing to commit to intergenerational living together and with organisations working with frail people,' she points out. The inclusive design of this scheme enables us to respond to social issues such as mobility for people with disabilities.

AccessSciencesDV : training young people in the sciences

Visually impaired since childhood, astrophysicist Ludovic Petitdemange from Sorbonne University's Lerma laboratory came to present "AccesSciencesDV". Also a high-level disabled athlete, he is working to make astronomy accessible to all, particularly the visually impaired, with the aim of demonstrating that visual impairment and scientific research are not incompatible. There are a lot of barriers to writing, reading, diagrams and calculators for the visually impaired. There is no miracle tools or software packages. The needs are immense, with 5 000 visually impaired people in inclusive education and universities having to adapt. 'Admittedly, new tools are coming on stream, based on AI and the emergence of new science courses based on coding, encryption and engineering science. Few visually impaired people go on to study science and have access to science-related careers,' points out Ludovic Petitdemange. Hence the idea of developing an independent, collaborative web platform for training in the sciences and in compensatory tools. It is also aimed at careers and teachers, and will help to stimulate the French community on these issues.

We're very keen to work with people with disabilities. It's a way of testing boundaries and, for a research scientist, it's very stimulating.

Researchers speak out on disability support

During the round table on the theme of 'Supporting a disabled person', with Marie-Christine Ho Ba Tho, a lecturer-cum-research scientist and member of the UTC-CNRS-BMBI laboratory who is particularly sensitive to the issue of disability and Vincent Coudé du Foresto, an astronomer at LESIA-Observatoire de Paris and head of the unit, we heard about aims to raising awareness and knowing how to behave when in the presence of colleagues with a disability, to ensure better integration. 'My responsibility is to put in place a team where everyone can work properly within the vision set by the laboratory. We are very keen to work with people with disabilities. It allows us to test the boundaries and, for a research scientist, it's very stimulating', says Vincent Coudé du Foresto. With the RQTH (Recognition of Qualification as a Disabled Worker) as an employment law tool, when case-declared, we can take action. So help us to help you. Finally, during the round table on the theme of 'being a researcher with a disability', the four speakers shared their experiences, their victories and their challenges, and as Vincent Zalc, a doctoral student at the BMBI laboratory, explained: 'The problem of disability, in my case, is a physical disability and, as long as you have the intellectual capacity to pursue your studies and you are properly oriented, the course itself can be taken. Then there's the problem of the accessibility of the premises, note-taking and the lack of contact with others when you're isolated. You often have to ask for help, and from that point of view it's psychologically hard. But I have to say that I've had a lot of help in my laboratory. Benjamin Lussier, from the Heudiasyc laboratory, François Gomez, from the TIMR laboratory, and Ludovic Petidemange, from the LERMA laboratory at Sorbonne University, were also able to tell their stories. Now I can say that I suffer from an autistic spectrum disorder,' concludes Benjamin Lussier. Noise, bright lights and tiredness all impact me. On the other hand, human contact, integration and collaborative work are all vital for me! ■ **KD**

PARITY / EQUALITY

Equality Month is a sacred period at 'UTC !

This year, UTC celebrated Equality Month from February 25 to March 27. **The programme included Master classes, round tables and an interactive conference in partnership with the UTC Foundation for Innovation.**

Each year, the UTC highlights the values of equality, inclusion and diversity through a series of events designed to strengthen dialogue and promote an equitable environment within the university community. For the 2025 edition of Equality Month, many participants were able to benefit directly from the various meetings organised around participative workshops and round tables in particular, all broadcast live on social networks and on YouTube®. The round table on March 3 addressed the theme of women in managerial positions, with Sofia Tiar, former executive vice-president of Euriware, Carole Weill, president of La Théière et le Biscuit, Marie-Laure Codaccioni, director of responsible digital services at mc2i, Céline Hocquet, founder of Phare West and Co, and Mathilde Baudoux, a 2024 UTC graduate and junior consultant at Mews Partners. For Mathilde Baudoux, there are less women than men in management positions, so the challenge is to act as role models for her female colleagues and demystify the accessibility of management positions. 'I also find it interesting that the term 'female manager' is rarely used. Do we Gallicise the word with "manageuse"or female manager? You never ask the question of a man. It helps to make invisible a role that has no gender. I think my generation has a different relationship to work than it did a few years ago. We're looking for a more meaningful job that matches our values, we're looking for ourselves and we're less reluctant to change if we're not convinced. For some time now, management has been seen as a job in its own right. And yet we receive very little training, both in education and in the workplace, I get the impression. It's a complicated job with both HR and technical dimensions. Not everyone wants to be a manager and not everyone is cut out to be a manager.

The web as a territory for expression

The interactive conference dealt with 'Leadership and energies: the place of women' with Nicolas-Louis Duclos, lecturer and research scientist at UTC, and Céline Hocquet, founder of Phare West and Co, business consultancy and coaching, and a former manager in the agri-food industry for twelve years. Another round table took place on March 24, entitled 'Educational accessibility: how to make teaching accessible to as many people as possible', with Delphine Brancherie, lecturer-research scientist in mechanical engineering, David Savourey, lecturer-research scientist in computer engineering and disability relay teacher for the core curriculum, and Thierry Ribeiro, lecturer-research scientist in process engineering. This was an opportunity to share experiences and propose innovative solutions for a more inclusive Society. The month began with a Master class by painter Céline Cénac. The chosen theme was 'Equality in all its forms'. Céline Cénac is deeply committed to the cause of women. 'March is a very important month for me. And yet Mars is the god of war, a man. It's incredible that this month has been chosen for women. And UTC's approach was brilliant, because it opened the door to all the inequalities in the world, beyond the inequalities that affect women', says the artist, who tackled the theme through her art. The canvas is an immense territory of expression, of freedom of expression. There are no limits, it's infinite and, above all, it's a silent art form that, through its silence, can convey emotions, denounce inequalities, challenge and defend. It's an immense force. Transmitting and awakening people to the fact that art encompasses these two forces, 'infinite freedom of expression' and 'the power of silence', is essential.' ■ **KD**

EXHIBITION, FILM AND WORKSHOP: STUDENT ASSOCIATIONS ALSO INVOLVED

Sciences Égales, in collaboration with BUTC (the university library), presented an exhibition open to all on women scientists in the shadows. Then, with STOP VSS, the association organised a workshop on rape culture and gender inequality, a forum for exchange and reflection to better understand these issues and deconstruct the mechanisms that perpetuate them. Finally, in conjunction with Ciném'UTC, Sciences Égales welcomed a large number of participants to the screening of Agnès Varda's L'une chante, l'autre pas, a film that retraces the journey of two women whose paths were at odds with each other but united by their feminist commitment in France in the 1970s.

FEEDBACK ON THE MASTER CLASS

Yuhan Jiang, 19, in her first year at UTC

'The main theme of my work is inequality, in particular the gap between rich and poor, because it's a subject that's both important and easy to represent visually. I chose a contrasting composition, with a left-right split, to reinforce the visual effect. Then, as we had recently been talking about environmental impact in lessons, I also added elements related to this theme.'

Gildas Bayard, research engineer at the UTC's Heudiasyc laboratory.

"I find it very interesting to take part in an artistic activity. I've never painted before and wanted to give it a try. I really enjoyed manipulating the colours. The relationship with the 'material' of painting is very concrete and physical. It provides a lot more fun than manipulating colours on a computer."

On Thursday 27 March, a jury made up of members of UTC, the artist, the UTC Foundation for Innovation and Workday, the event's partner, awarded prizes to the three winners.

PARTNERSHIPS / SPONSORSHIPS

A sponsorship partnership agreement between UTC, mc2i and UTC's Foundation for Innovation

mc2i is a key player in digital transformation, a facilitator of vocations and a trusted partner for students and educational establishments. Committed to students, mc2i supports them in defining and building their professional project by offering them privileged access to its expertise and concrete feedback. This partner has joined the UTC Foundation for Innovation as a sponsor.

Founded in 1989, mc2i is a digital transformation consultant agency with offices in Paris, Lille, Lyon, Nantes and Brussels. It supports major accounts in the management of large-scale projects, drawing on sectoral, functional, methodological and technological expertise. Its consultants work in both the private and public sectors, providing solutions tailored to the strategic and operational challenges of each organisation. Working in partnership with schools, the firm contributes to their development and encourages young talented people to develop their personal skills. As a committed company, mc2i supports the UTC partnership foundation through various values such as innovation and excellence, ethics and responsibility in order to promote responsible engineering that respects the environment and societal issues. mc2i supports the UTC Foundation for Innovation to encourage exchanges between the academy and industry to enhance mutual skills, but also for the commitment to a sustainable world and to encourage employees to become capable of evolving in a constantly changing environment', explains Lorenzo Bertola, Director of the Banking, Finance & Insurance division at mc2i, since 2025 also Deputy Managing Director in charge of the transformation of mc2i for several years to become a more responsible digital world.

Contributing to the UTC Chair of Social Openness and Innovation

This commitment became a reality in 2023 with the award of the Numérique responsable level 2 label, granted by the Institut du numérique responsable and the Lucie agency. 'This recognition encouraged us to go even further in structuring our CSR (corporate social responsibility) policy, with the conviction that our activity must integrate the ecological, social and ethical issues linked to digital technology', adds Lorenzo Bertola, also a 2003 alumni of the UTC in computer engineering, who shares the conviction that diversity and social openness are a factor of innovation for companies. 'We will be party to the steering committee of UTC's Chair of Social Openness and Innovation as well as in the technical committee, sharing our feedback and the actions we are taking in this area. These are centred around three areas: communication, awareness-raising and support. In terms of communication and awareness-raising, we put in place throughout the year a wide range of initiatives to promote diversity and inclusion, such as round tables on the subject of parity in the digital professions, hosting students on our premises and workshops to raise awareness of disability issues'. In terms of support, mc2i promotes excellence, cooperation and knowledge-sharing through all its forums and school interventions. ■ **KD**

Preparing tomorrow's engineers through AI and responsible innovation with Workday

Workday, the UTC Foundation for Innovation and UTC have entered into a sponsorship partnership with the aim of preparing tomorrow's engineers through artificial intelligence and responsible innovation.

UTC, the UTC Foundation for Innovation and Workday have joined forces with the shared aim of preparing future engineers for responsible AI. By focussing on artificial intelligence, innovation and societal responsibility, this alliance aims to strengthen the skills of students to enable them to meet technological and societal challenges while responding to the needs of companies in the midst of a digital transformation. The UTC Foundation for Innovation, chaired by Patrick Dupin, Deputy Director General and General Manager for the Northern Europe Region of the Saint-Gobain Group, brings together players committed to scientific excellence and applied research alongside the UTC, which is directed by Prof. Claire Rossi. By including Workday, world leader in cloud solutions for managing human and financial resources, as a new sponsor, the UTC Foundation for Innovation is strengthening its network of academic and industrial partners. The partnership with Workday will enable UTC to strengthen its expertise in AI, in line with the needs of companies undergoing digital transformation. 'We have been involved in AI for a very long time now. We welcome these exchanges between academia and industry. We have a lot to learn from engineering schools like UTC, which is taking concrete action to promote innovative training and a connected future,' says Hervé Uzan, Group Vice President, EMEA South at Workday and a 1989 UTC graduate in computer engineering.

A partnership that undertakes concrete initiatives

Workday, a US company specialising in cloud applications for human resources and finance, was introduced to the stock market in 2012 and now has more than 20 000 employees serving 11 000 customers worldwide. 'However, we are always on the lookout for innovations. For example, we have met a number of start-ups from UTC, such as Ontbo, the first AI to analyse emotions. We're looking into the possibility of integrating it into our HR technologies. At the same time, Workday is going to offer UTC students the opportunity to prepare themselves even better for the challenges of their future careers, particularly in the field of AI, by offering students immersions in Workday's businesses through visits to the premises and discovering how an innovative company works and the career prospects in the fields of finance, human resources and planning. 'One of the most innovative aspects of this partnership is the collaboration with UTC's Chair on Safe IA. This scientific partnership will strengthen the links between teaching, research and industry,' concludes Hervé Uzan. The aim is to prepare students to become the innovators of tomorrow, capable of understanding the complex interactions between technology, people and Society, while contributing to sustainable development. Together, we are creating the conditions that will enable these future talents to flourish in a constantly changing world and meet the challenges of the global economy and technological issues. ■ **KD**

SMAÏN FETTEM

A young man who learned how to bounce back

Smaïn Fettem, who graduated from the UTC in 2023 majoring in biological engineering, is currently a research engineer at the European Genomic Institute for Diabetes (EGID), an international institute dedicated to research into diabetes (types 1 and 2). He is working on AI tools designed to predict whether a person is likely to develop type 2 diabetes. Portrait of a young man who, despite running into a few potholes in the road, was always able to bounce back.

The first setback came in 2016, after he had passed his science baccalaureate, when he enrolled in medical school. 'At the time, treating people seemed like a wonderful mission', he confides. However, he soon realised that this was not the path he wanted to follow. Thinking back to his childhood dream of becoming an inventor to help others, he decided after two months to join a "preparatory class" at his lycée. A few months later, he left the preparatory class, his second setback, but this gap year enabled him to clarify his educational and professional ambitions. 'I realised that what I wanted was to work in biomedical engineering, a field that develops devices to improve patient care', he explains.

Seen in this perspective, rhz university UTC, renowned for its excellence in biomedical engineering, was the obvious choice for Smaïn Fettem. However - and this was to be the final pitfall - after his application was assessed, he was refused admission. He didn't give up, however and opted for the IUT A in Lille, where he began studies in electrical engineering and industrial computing (GEII), seeing it as a possible gateway to what was his passion: biomedicine. For two years, he gave himself the means to achieve his ambitions and finished among the top-ranking students in his year. With his Lille degree, he returned to the UTC, this time being successfully admitted in the biological engineering programme. 'This time, I was on the right track. After a first year in a rather general branch, I was lucky enough, at the beginning of the second year, to do a placement at the Signal and Image Processing Laboratory (LTSI) in Rennes. It was there that I began to work on AI and to grasp its full potential in a wide range of fields, particularly biomedical domains', explains Smaïn Fettem. His end-of-studies placement took him to Carmat, a company specialising in artificial hearts. There, he took a break from AI and worked mainly on signal processing.

However, he soon got back into AI, since, with his UTC diploma in hand, he joined EGID as a research engineer. 'We're working on tools to predict whether or not a person will develop type 2 diabetes during their lifetime. In concrete terms, we can say that the DNA between individuals is 99.9% identical, with the remaining 0.1% constitutes genetic variations between individuals, or more commonly known as 'variants'. We have a database of several million variants, and that's where the role of AI is important, more specifically the large language models capable of providing huge amounts of input data, which will enable us to predict whether a given person will develop diabetes, and which particular variants or combinations of variants will be responsible for it', he says.

BIONOTES

2020 : admission to UTC

2021 : placement in the LTSI-Rennes (Signal and Image Processing Laboratory) and his first encounter with AI

2024 : took up research intensive engineering post at the European Genomic Institute for Diabetes

His experience at UTC? 'I particularly appreciate the fact that we are treated as future engineers and not as students. Hence the importance given within this university to the development of our critical sense, but also to the acquisition of real autonomy and a spirit of innovation, but not ignoring the ethics and impact of that same innovation. Engineers need to take a step back and realise that they have a duty of responsibility with regard to the tools they are going to develop. Will they help or harm people? That's the key question', he concludes. ■ **MSD**

AGENDA

RDV: AI & TRAINING
Friday March 28, 2025
UTC's Daniel Thomas Innovation UTC
www.utc.fr

THE ÉTUVILLE GALA
Saturday May 24, 2025
Domaine de Montigny
etuville.fr

FESTIVAL LES CONFETTIS
May 30-31, 2025
UTCs Research Centre and the Pierre Guillaumat Centre UTC
www.utc.fr

RACING FOR CHARITY LA VOIE DU HOUBLON
Saturday June 7, 2025
Parc Songeons
assos.utc.fr/lavoieduhoublon/

Interactions
interactions.utc.fr

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