

# Interactions UTC

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## **Mechatronics serving the cause of innovation**

The Institute of Mechatronics created in 2008 by UTC and the Senlis site of CETIM (Centre technique des industries mécaniques), has recently inaugurated its hydraulic platform. Objectives: to provide in-depth training of engineers in hydraulic sciences and technologies and to develop new industrial partnerships to help innovate in a field that is revolutionizing mechanical engineering as a whole.

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"Mechatronics is defined as the specialty that allows new data processing and communications sciences and technologies to be integrated to mechanical engineering", proposes Mohammed Cherfaoui by way of an introduction. M Cherfaoui gained his diploma in mechanical engineering at UTC and is now head of the Mechatronics division at the CETIM. "It is thanks to mechatronics", he adds, "for example, that we have smart self-driving cars today on the road." CETIM who have a regional site at Senlis, in Picardie Region and UTC have been collaboration now for 40 years. In 2008, these establishments set up the Institute of Mechatronics, which has received subsidies close on 6 M euros (40% from the Picardy region, 60% by CETIM, UTC and industrial partners). This was followed by instating a university Chair, in this promising field - first of its kind in France - and the hydraulic platform. "This new piece of complex equipment, developed with the CETIM, and which - in the long term - will integrate UTC's infrastructures, will bring a strong added value to our engineer training curriculum and will help us develop our industrial partnerships", says Benoit Eynard, research scientist and lecturer at UTC, Director of the Institute. The mechatronics platform is installed in Compiègne, with 3 test rigs

that correspond well with UTC's research themes and needs expressed by industrialists.

## **Energy-related efficiency, noise abatement and training**

The first test unit, under the heading "Energy and Models" is devoted to optimizing energy consumption. "Sensors placed in car components, for example in tires, provides accurate reading of pressure. Naturally the sensors themselves must consume a minimum energy themselves," adds Mohammed Cherfaoui to illustrate. The second test rig is called "Vibratory and pulse analysis" relates to reducing noise levels generated by hydraulic transmission lines. The rig was designed in collaboration with Poclain Hydraulics, cf. [www.poclain-hydraulics.com/en](http://www.poclain-hydraulics.com/en) and was supported financially by the ADEME (French national energy control agency). The third rig is baptized "Pedagogy through practice" and provides a way to approach mechatronics by hands-on teaching situations. "This is very important if we wish to train operations-ready engineers", stresses Benoit Eymard. The platform equipment units (all low powered devices) allow the operators to assess and validate resrecah before moving to high power tests, which are most costly, take more time and use a lot of energy, with the standard CETIM units. "In fact, the platform and standard units at CETIM are complementary", recalls Mohammed Cherfaoui, adding that CTEIM invest some 10 M euros/yr in R&D in the mechatronics field: "France, the only European country to possess a trade union in mechatronics, ARTEMA, is the leader in the field".

## **High mechatronics recruitment demand**

ARTEMA cf. in French, <http://www.artema-france.org> has 100 members, representing some 28 000 direct jobs, an annual turnover of 5.7 billion euros and 80% of France's mechatronics products and services. The job-scene in this area is buoyant. "Engineers with a mechatronic specialty must be able to master

mechanical engineering and electronics, computer science, etc., and secures a job opportunity quite easily", assure Mohammed Cherfaoui. Benoit Eynard confirms: "Only a handful of French universities give training in mechatronics. UTC offers a complete course, open to graduates who qualify in mechanical engineering and mechanical systems engineering". ARTEMA also co-operates with UTC and the CERIM for course design and research: "we sometimes find it difficult to recruit the right profiles!" explains Laurence Chérillat, ARTEMA's Secretary General. "Hydraulic transmission systems are largely unknown territory, whereas the industrialists have clear and important needs to recruit qualified staff in these specialist areas. UTC is a major, indeed unique, partner in France. For this reason, our industrial members support the Institute. The new platform has become a necessity to see the UTC students come to work on the test benches and develop high level R&D".

## **The platform as a shared facility for industrialists**

For Ms Chérillat, the objective of the platform is to offer a workplace conducive to SMEs with innovative mechatronic projects. "The scope for our SMEs is truly world-scale. The platform should enable them to access high level R&D arming them to face strong international competition". Among the numerous companies present for the inaugural ceremonies, Poclain Hydraulics, whose representatives insisted on "the innovative lever that mechatronics can become", says Mohammed Cherfaoui. Locally based agricultural equipment companies (AGCO) are also interested in possibilities. "The platform allows you to consolidate a value chain in the Picardie Region, totally in phase with the local innovation eco-system. The platform was the 'missing link' for is to build new partnerships; the platform also bridges the world of resrecah at UTC and the development of applications conducted by CETIM and the industrial partners", says Benoit Eynard. Laurence Chéraillat recalls also that the platform is open to the entire profession and

that its vocation is to gain high national visibility in the field.

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