Paris, July 19, 2011

PRESS RELEASE

A collaborative robot for industrial gesture assistance

The CETIM and CEA LIST have pooled their expertise in mechatronics to design a collaborative robot, or "cobot". Combining all the intelligence and adaptability of man with the strength of robots, the "cobot", developed in partnership with RB3D, multiplies human strength to help perform heavy and repetitive industrial tasks.

Gesture assistance

Developed and produced by RB3D based on a combination of its own technology and that of the two Carnot institutes, CETIM and CEA-LIST, the "cobot" is a mechatronic arm designed to perform heavy industrial tasks, such as brushing and chipping, as well as other applications. The operator controls the tool using the instrumented arm: "*where a brushing operation requires a force of 20 kilos, the ˝cobot˝ only requires one kilo*," explained Serge Grygorowicz, CEO and founder of RB3D.

A robot designed for force

Recent progress in manufacturing robotics has now resulted in direct interaction between man and robot. Mainly developed for fast and simple programming needs, interactive control functions for industrial robots such as these do not, however, make force amplification possible. Moreover, controlling these systems is tricky due to their inertia, which has a considerable impact on what the operator "feels".
To overcome such performance challenges and in a bid to develop a new generation of industrial robots, CEA-LIST has drawn on its expertise in force-feedback remote-controlled operation, originally developed for the nuclear industry. It has thus been involved in designing a collaborative robot, the "cobot", dedicated to force generation. Thanks to the intuitive control mode integrated in the "cobot", the force applied by the operator is amplified by a factor that can be adjusted within the range 1 to 50, using a single force sensor. The operator thus remains aware, in quantitative terms, of how the task is proceeding, since the force feedback parameters can be set. Apparent inertia and other imperfections that might be felt by the operator (e.g. friction) are also substantially reduced thanks to the introduction of the amplification factor.
The CETIM's role in the project entailed structuring the mechatronics-based design approach. The scale of its support, calling on some of the leading experts in the field, also included ensuring the end product's compliance with EU directives relative to methodology, technical support and the certification procedure.

Mechatronics to improve human health

The "cobot", with its extensive integrated software, is totally in line with RB3D's "Mechatronics" strategy. The SME has an ace up its sleeve: "*The fact that we are such a young company means that, from the start, the people that work here are all trained in Mechatronics*," explained Serge Grygorowicz. "*Integrating mechatronics, which is such a natural progression, enables us to develop intelligent tools, designed for industry, tools which, in particular, aim to provide humans with strength and endurance in their tasks, at the same time reducing the risk of work-related MSDs (musculoskeletal disorders)*."

The force of a network
The CETIM and CEA-LIST, which have been Carnot Institutes since 2006, have just been granted the Carnot label for a further period of 5 years. The two institutes have worked together for many years, and the award of this label recognizes their commitment to their research partnership.

About CEA
The French Atomic Energy and Alternative Energies Commission (CEA) is a public technological research body. Widely-recognized for its excellence in fundamental research, CEA is active in four main fields: low-carbon energy, defense and global security, information technology and health technology. It plays a key role in the European Research Area and is internationally-renowned as an expert in its fields of excellence. CEA participates in setting up joint projects with numerous partners around the world. For more details, see the CEA website: www.cea.fr
Within the Technological Research Division, the CEA-LIST institute carries out research on intelligent digital systems. By developing cutting-edge technological research, CEA-LIST helps its industrial partners to enhance their competitiveness thanks to innovation and technology transfer (www-list.cea.fr).

About the CETIM
As a bridge between research and industry, CETIM (the Technical Center for the Mechanical Industry) is France's center of expertise in mechanical engineering. An R&D platform encompassing 7,500 mechanical engineering firms, the CETIM employs 700 people, over half of whom are engineers and technicians, and has annual turnover of 100 million euro. It develops its activities in conjunction with a network of scientific and technical partners. The CETIM works in very close liaison with its customers in France. Its capabilities for working with industry extend worldwide, more particularly in French-speaking countries. As the leader of numerous ground-breaking projects, it coordinates major multi-partner industrial and R&D projects in 5 key areas: design, simulation and testing; production processes and materials; mechatronics, control and measurement; sustainable development, management and support for SMEs. Together with leaders in specialized fields, the CETIM provides integrated and multidisciplinary services aimed at transforming and implementing scientific knowledge for industrial applications. www.cetim.fr.

About RB3D
The Mechatronics company, RB3D, specializes in the design and manufacture of intelligent tools. Winner of France's *Concours national d'aide à la création d'entreprises de technologies innovantes* (Ministry of Education competition in support of innovative technology startups) in 2001, the year the company was set up, RB3D has also won several INPI-Burgundy awards for innovation. The SME, which now employs twelve people, spends 20% of annual turnover on R&D. Thanks the network that it has developed, RB3D has launched a number of research projects in collaboration with technological research bodies such as CEA and the CETIM.

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