



PhD Thesis Opening

The LIRMM (Montpellier Laboratory of Computer Science, Microelectronics and Robotics) in France is seeking a candidate for a PhD funded by ETEL Motion Technology, in Switzerland.

“Towards pick-and-place machines with very high accuracy and dynamics”

High precision industries, such as semi-conductor industry, are in need of machines combining high accuracy and high throughput. To date this need has been covered mostly by standard equipment such as X-Y tables; however this approach is now reaching its limits in terms of maximum speed and acceleration. On the other hand, robots have been designed for pick-and-place industries which can reach very impressive accelerations but none of them have demonstrated enough accuracy to satisfy the semi-conductor industry requirements. Indeed designers are facing two scientific and technological barriers: serial machines suffer from high inertias limiting their acceleration capability; parallel mechanisms suffer from poor stiffness limiting their accuracy.

This thesis aims at advancing those frontiers and will be developed in synergy between the ETEL Company (Switzerland) and LIRMM (France).

Contact

Academic contact at LIRMM Dr. Sébastien Krut, sebastien.krut@lirmm.fr

Industrial contact at ETEL will be Dr. Samir Bouabdallah, SBouabdallah@etel.ch

Research approach

The research work will be guided by generic needs coming from industrial applications. Starting from this, innovative concepts of kinematics, actuation systems, measurement and control strategies should be investigated. Modelling of various inaccuracy-sources (joints, transmissions, vibrations, control, etc) should be carried out so that their impact on the global system can be clearly understood. In this research work, both mechanical design and control issues should be investigated. Along the project, assessment of results and proof of concepts should be made by designing and operating prototypes.

Environment

ETEL is the world's leading supplier for direct drive and motion systems with research, development and production facilities in Môtiers, Switzerland; LIRMM is a joint laboratory of Université Montpellier 2 and CNRS, and is installed in Montpellier, France. Research will be mostly done in Montpellier but frequent visits and stays in Môtiers are foreseen. Ph.D. dissertation shall be written in English to facilitate dissemination among ETEL employees.

<http://www.etel.ch>

<http://www.lirmm.fr>

Academic adviser will be Dr. François PIERROT (<http://www.lirmm.fr/~pierrot/>).