Program

	SESSION I				SESSION II				
	Monday 15 May, 2017	Tuesday 16 May, 2017	Wednesday 17 May, 2017	Thursday 18 May, 2017	Friday 19 May, 2017
8:45 – 10:15 (1.5h)	Industry 4.0 Industrie 4.0 - Driving the Digital Enterprise Speaker: Ittipol Pratesa (Siemens Thailand)	Industrial Communication Expert in Industrial Communication Speaker: Taipark Akkara-aketalin (Siemens Thailand)	PKM Architectures Lecture Speaker: O. Company (LIRMM)	Control of PKM Lecture Speaker: A. Chemori (LIRMM)	Cable-Driven Robot Lecture Speaker: M. Gouttefarde (LIRMM)
10:15 – 10:45	Opening Ceremony Coffee Break	Coffee Break	Coffee Break	Coffee Break	Coffee Break
10:45 – 12:15 (1.5h)	Industry 4.0 Smart Factory Speaker: Martin Wenzel (CEO KUKA Thailand)	Industrial Communication Industrial Communication in Industrie 4.0 Speaker: Taipark Akkara-aketalin (Siemens Thailand)	PKM Kinematics Lecture Speaker: O. Company (LIRMM)	Advanced Control of PKM Lecture Speaker: A. Chemori (LIRMM)	Cable-Driven Robot Simulation Lab Speaker: M. Gouttefarde (LIRMM)
12:15 – 13:45	Lunch	Lunch	Lunch	Lunch	Lunch
13:45 – 15:15 (1.5h)	Industrial Robot Digital Manufacturing /Robotic Simulation Speaker: Ittipol Pratesa (Siemens Thailand)	Exhibition Display/Demonstration Industrial Robots, Cooperative Robots, Research Robots --- coffee/drink ---	Excursion + Social Events	Project Simulation	Round Table Discussion
15:15 – 15:30	Coffee Break			Coffee Break	Farewell Reception
15:30 – 16:45 (1.5h)	Industrial Robot Robot Simulation connect to Shopfloor Speaker: Ittipol Pratesa (Siemens Thailand)			Project Simulation	

Admission

Session I: The number of participants is limited to 40. This session is opened for students, technicians, business owners, business personnel in SMEs and private sectors and those who have interests on robotics technology.

Session II: The number of participants is limited to 20. This session is aimed for master and Ph.D. students, researchers and professionals.

Participants can register in one of these sessions or both. The admission is free of charge. Coffee breaks and lunches will be provided. However, accommodation and transportation are not offered. Participants must cover these expenses on their own.

The registration will be opened until the 8th of May 2017 at www.lirmm.fr/wir-2017/registration.html.

Contact

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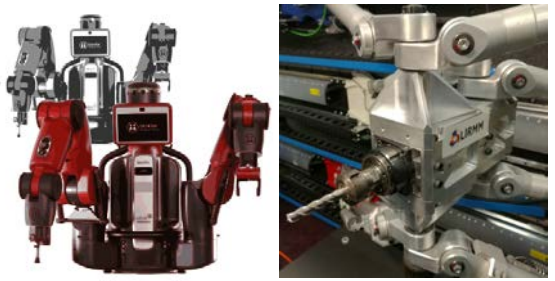
KUKA SIEMENS

Thai-French Workshop on Industrial Robotics: Recent Advances

WIR 2017



May 15-19, 2017
Chiang Mai (THAILAND)

Coordinated by
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Chiang Mai University

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LIRMM, CNRS – University of Montpellier

Session I: Industry 4.0 -- Robotics

Industry 4.0 is the current trend in industrial automation and robotics around the world. The term “Industries 4.0” was first coined at the 2011 Hanover Fair to describe the next revolution of high-tech industry, which involves bringing intelligence, connectivity and much broader computerization to manufacturing. Some key elements in Industry 4.0 include: interoperability, decentralization, real-time data collection and analysis, visualization, modularity and flexibility. Many leading automation companies have been working hard to offer new lines of products that fall within this framework. In the fields of robotics, for example, human-friendly robot have become one of the newest offers to SME business. Mobile manipulator is another example of a new concept that may play a major role in factory automation in the near future.

In Thailand, Industry 4.0 is one of the main pushes to achieve sustainable economy. Various policies have been and are being revised in order to make robotic and automation industry the big part of Thailand’s economy. The success will surely depend on how automation technologies in the new Industry 4.0 framework are integrated into existing industrial environment and how quickly private sectors can adopt the change in technology. There is a need to bring about the awareness and readiness to those involved in the process. This session gives opportunities for those being along the line of development to review current development of automation technology.

Session II: Parallel Kinematic Systems

The use of parallel kinematic systems in factory automation has been around for sometimes. Most robots that people are familiar with are mainly a serial type. However, in some applications that need high speed and/or high precision motions, parallel robots are superior. The parallel kinematic structures of those robots are quite interesting and can be very complicated.

Control and mechanical Robotics community have devoted a huge research effort on parallel kinematics systems in the past four decades. The interest was motivated by a clear breakthrough compared to conventional serial robot architectures. Parallel kinematics systems have demonstrated higher performances in:

- dynamic capabilities in terms of high accelerations (up to 100G accelerations have been reached by prototypes, pushing the limits of the mechanics, control and actuators),
- high payloads where hexapod systems can lift today several tons and position them accurately with six degrees of freedom,
- Increased stiffness.

Scientific community has addressed many research topics. This work was mainly specific and as an example, we can cite in an unsorted manner: kinematics, dynamics, singularities, type-synthesis, dimensional synthesis, control, simulation, calibration, identification, design, technology, performance indices, reconfigurable devices and experiments.

A good control of these points is requested to obtain a convincing running prototype with potential applications in industry as a special machine or as a commercially available product.

As a short list of products that have reached a mature stage in industry, we can mention:

- Hexapods or hexapod-like robots (also known as Gough, Stewart or Gough-Stewart platforms). Among them we can mention some products from PI, Symétrie company or Fanuc,
- Delta or Delta-like robots, licensed to ABB (Flexpicker) and now whose patent has entered the public domain. Consequently, this kind of robots is available from several robot manufacturers (Fanuc, Codian Robotics, SIG Pack Systems, Panasonic…),
- Tricept (Neos Robotics) and Exechon (Exechon AB),
- Quattro (Adept).

Indeed, it is worth to notice that despite the huge research effort devoted to this field, only few products are available on the market. The main reason lies in the fact that such robots can seem complex and require a big research investigation and the academic research is split up into specialized domains. Moreover, when prototypes or demonstrators are built, the goal is to validate theories through experiments and not to convince industrial partners for future products or applications.

Nevertheless, some demonstrators are built in that way meeting industrial applications. On a research point of view, theory has to face today’s state of the art technological limitations in several issues like:

- Industrial control systems,
- Active and passive joints integration,
- Collision avoidance.

Content

Session I: The topics include the current trends in Industrie 4.0, namely

- Digital enterprise
- Smart factory
- Digital manufacturing
- Industrial communication
- Robot simulation

These will be covered in presentation and demonstration.

Session II: The topics tackled during the sessions include:

- Kinematics and dynamics,
- Design,
- Control,
- Special sessions on cable driven parallel robots.

These topics will be covers in both lectures and simulation sessions.

Invited speakers

Session I:

Ittipol Pratesa,
Taipark Akkara-aketalin,
From Siemens (Thailand)
Martin Wenzel
From KUKA Robotics (Thailand)

Session II:

Ahmed Chemori,
Marc Gouttefarde,
Olivier Company,
From LIRMM, UM/CNRS (France)

Lectures and materials

In session I: All presentations will be given in English.
In session II: All lectures will be given in English. The lecturers' slides will be available at the time of the class. *The students are advised to bring their own laptop with a running Matlab version.*

Venue

All the presentation and lectures will be given at Faculty of Engineering, Chiang Mai University.
www.lirmm.fr/wir-2017/how_to_get_there.html.