

PROGRAMME OF WORKSHOPS MECATRONIC 2010

12 and 13 october 2010 – Torino (Italy)

Tuesday 12 October 2010

Conference 1

11.30 – 12.00 : « Safety design procedures for mechatronics automotive systems » (SISMA PROJECT).

Speaker : Renato Librino - 4S Group

SISMA aims to offer designers of automotive electronic systems a support to meet the requirements of the norm ISO 26262, which concerns the functional safety of road vehicles.

A software environment, together with an innovative test equipment, will be realized in order to rapidly and exhaustively perform the numerous safety analyses required to design a safe system, and to automatically execute the tests as to validate the system in nominal and faulty conditions, applying the fault injection technique.

Conference 2

12.00 – 12.30 : « Nanostructured coatings for mechatronics applications : eco-efficient manufacturing and hyperfunctional components » (LAVOECO & RACA PROJECT).

Speaker : Massimo Perucca - CleanNT Lab Envi Park

The project aims at developing innovative metal cutting tool materials and nanostructured coatings for wear protection of Tools with the following properties: development of special hard metal grain composition with a lower content of binder (Co,Ni) and a “nanostructured” composition to improve the mechanical properties and the wear resistance of hard metal substrates and to avoid the use of “strategic” materials (like Co, Ni) :

- development of new advanced class of superhard and functional coatings specific for hard metal cutting tool applications.
- development of innovative coolant systems based on MQL technology for different type of cutting tools and machining operation's.

Conference 3

12.30 – 13.00 : « Methods and tools for robotized cells design » (ROBOTCELL PROJECT)

Speaker : Giorgio Gaidano - AMET

The feasibility study focuses on innovative methodologies and tools for the design of complex robotized cells, namely CAx solutions, including virtual simulation, programming and control for off-line design.

Complex robotized cells are composed by many arms with axes redundancy, that hides the singularities management problem for control applications: the feasibility study addresses possible mathematical approaches to solve these problems through suitable algorithms.

Off-line programming potentially offers great and cost-effective benefits mainly due to reduced times of out of production, improved operator safety and quicker changes to work cell layout.

Conference 4

14.30 – 15.00 : « Flexible Micro-manufacturing System coupling laser and high speed drilling machine » (M-FLEX PROJECT)

Speaker : Giorgio Mang - MAGER AIR BEARINGS

Project's goal is the development of a prototype machine for micromachining characterized by the contemporary presence of a laser head and a high speed micro-drilling spindle. Movement axis and high speed spindle shall be based on the pneumostatic technology.

The System shall be characterized by the following:

- 1 high level of flexibility in terms of wide micro-manufacturing capabilities and wide range of involved materials;
- 2 micrometric performances in terms of manufacturing precision and quality due to the coupling of air-bearing with direct drive motors (no friction movement system);
- 3 high level reliability and energy efficiency due to pneumostatic sliders without mechanical contacts and wear.

Conference 5

15.00 – 15.30 : « Optical multi-camera sensor for monitoring of the operational space for industrial robots, machine tools and production processes » (AMICO PROJECT)

Speaker : Gabriella Caporaletti, EICAS AUTOMAZIONE

The AMICO Project aims at designing, developing and testing a multi-camera optical sensor able to realize an intelligent and flexible monitoring and control of the operative space of industrial robots, machine tools and production processes.

The sensor allows the contact-less measurement of the "pose" (position and attitude) of moving bodies and it will be conceived and developed for achieving the following outstanding characteristics:

- ability to work in an industrial environment by adapting itself to variable environmental conditions
- high dependability;
- use of low cost cameras;
- "Plug & Play" functionality.

Conference 6

15.30 – 16.00 : « Integrated multisensory Platform for mechatronics applications » (OMNIMEC PROJECT)

Speaker : Laura Boschis, TRUSTECH

The project is focused on multisensor general purpose platform for mechatronics applications, able to monitor and measure typical parameters. OMNIMEC is a flexible and easy to use "brick" available for mechatronic designers. Flexibility is related to wide range measurement capabilities and to standard interface with data acquisition systems.

Platform can be equipped with two different kind of sensors:

- environmental sensors for pressure and flow measurement;
- mechanical sensors: acceleration, vibration and force/torsion measurement.

Conference 7

16.00 – 16.30: « Real time open source and expandible Hw/Sw automation framework for mechatronics environments » (FAROS PROJECT)

Speaker: Fulvio Mancuso - PRIMA ELECTRONICS

The final goal of the Framework is to realize an integrated open and expandible Hw/Sw mechatronic environment, able to cover different industrial needs, from rapid prototyping to testing.

The Framework is based on Open Source Hardware and Software modules and industrial standards inside a web 2.0 environment (forum, doc, revision control, download, mailing list, wiki, ...) and must cover the most important design needs for mechatronics and advanced production systems (as motion control and PLC programming, expandible to production management).

Wednesday 13 October 2010

Conference 8

9.30 – 10.00: « Dynamic modeling of mechanical structures including piezoelectric transducers »

Speaker: Prof. Andrea Tonoli - LIM Mechatronics Lab Politecnico of Torino

Workshop

10h00 - 10h30: « Reliable Certified Robust Engineering Aids-Tools-Experience »

Speaker: : Re-crea-t-e PROJECT

Project's goal is a real time Web based design procedure in the fields of Mechanical Engineering and Industrial Design.

At a first stage, product special archetypes to be stored inside specific and ready-to-use toolings libraries will be prepared; thus, 3D models coherent with technological/homologation specification and all CAD commercial systems will be obtained. Then dedicated SW, to be used on line, will be created in order to quickly and perfectly generate catalogue libraries, whose input will be functional parameters instead of geometrical ones.

Expected results are a high increase in design quality, extreme Time to Market reduction, recovery and value of territorial competences in advanced design field.

Conference 9

10.30 – 11.00: « Mechatronics systems for energy efficiency in bus transport » (SIMEBUS PROJECT)

Speaker: Annalisa Scarpelli - Franco Rubini, ACTA

The SIMEBUS project aims to develop and validate mechatronic modules that will improve the efficiency and environmental impact of the existing and traditional BUS transport by equipping them with photovoltaic systems.

Through the electricity produced in presence of sunlight the photovoltaic systems will recharge the batteries used for the operation of BUSES electric facilities such as on board lighting, ventilation, opening doors.

The benefit will come from a reduction in fuel consumption and elimination of bus stops with running engine needed to recharge the batteries to ensure the necessary electrical power for on board electrical systems. Moreover, an additional benefit for the whole community is given by pollution reduction in urban areas.

Conference 10

11.30 – 12.00: « Design and development of advanced automatic production system in biomedical field » (BIOMICROFAB PROJECT)

Speaker: Pieralberto Dalla Pietra, HEXACOM

The project is aimed to develop an advanced automatic production system in Biomedical field, addressing and resolving a series of technological problems specific to the automated assembly of microstructures.

This prototype will be built by integrating different technologies, such as preparation of laser micro machined components, self-alignment of them, micro robotics applications, advanced vision systems, allowing the automatic assembly of micrometer products while minimizing waste and human intervention.

In detail, the project is aimed to produce devices for the treatment of cardiovascular diseases, particularly those devices called “coronary stent”.

Conference 12

12.00 – 12.30: « Managing the economic value of technology & IP assets : the MESAP case »

Speaker: Pier Angelo Biga, Director of IP Finance Institute & ICM Research

Conference 13

12.30 – 13.00: «Technologies and systems for revolving ball joints monitoring» (PROJET STATUS)

Speaker: Jean-Jacques Tomas – OCAP

The project is aimed to solve problems related to ball joints wear by proper sensing methods, also able to properly manage product maintenance.

Ball joints show wide range industrial applications. The project deals with automotive sector (steering/suspension joints for buses). The final goal is continue monitoring of wear levels, with high increasing of overall functional safety.