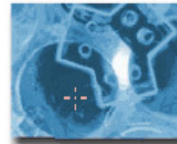


# 3rd Robotics & Mechatronics Symposium (ROBMECH 2009)

**9 November 2009**



**Venue: CSIR International Convention Centre**

**Registration:**

**Online - <http://armrn.manufacturingafrica.com>**

**Email - [rcoetzee@csir.co.za](mailto:rcoetzee@csir.co.za)**

**Tel no - +27 12 841 3612**

**R.S.V.P Online by 1st of November 2009**

**Keynote Speakers:**

**Dr Davide Scaramuzza - ETH, Zurich**

**Mr Gary Menzies - Barlow World**



science  
& technology  
Department:  
Science and Technology  
REPUBLIC OF SOUTH AFRICA



Central University of  
Technology, Free State

**amts**  
advanced manufacturing  
technology strategy

**Contact Persons:**

**Mr Riaan Coetzee ([rcoetzee@csir.co.za](mailto:rcoetzee@csir.co.za))**

**Prof Glen Bright ([brightg@ukzn.ac.za](mailto:brightg@ukzn.ac.za))**

## Programme

### 8 November 2009

19:00 -21:00	Welcome Dinner	RSVP during registration
--------------	----------------	--------------------------

### 9 November 2009

07:45 – 08:30	<b>Registration</b>	Foyer
08:30 – 08:35	<b>Welcome from the CSIR</b>	Dr Liesbeth Botha
08:35 – 08:40	<b>Opening Address</b>	Mr Riaan Coetzee & Prof Glen Bright
08:35 – 09:15	<b>Keynote Speaker</b>	Dr D Scaramuzza
09:20 - 10:00	<b>Keynote Speaker</b>	Mr G Menzies
10:00 – 10:15	<b>Refreshments</b>	
10:15 – 12:15	<b>Parallel Session 1A: RMS</b>	
	<b>Design of Modular Machine Tools for Reconfigurable Manufacturing</b> <i>Jared Padayachee, Glen Bright</i>	
	<b>Concept of Reconfigurability in the Environment of Tooling Industry</b> <i>AO Oke, K Abou-El-Hossein, N Theron, I Gorlach</i>	
	<b>Real time distributed control of flexibly automated production systems through kernel encapsulated Artificial Intelligence primitives</b> <i>Anthony Walker, Glen Bright</i>	
	<b>QUALITY CONTROL FOR RECONFIGURABLE CELLULAR MANUFACTURING ENVIRONMENTS</b> <i>Shaniel Davrajh, Glen Bright</i>	
	<b>Process Control and Configuration of a Reconfigurable Production System using a Multi-Agent Software System</b> <i>Jean Janse van Rensburg, Herman Vermaak</i>	
10:15 – 12:15	<b>Parallel Session 1B: Applications</b>	
	<b>A Robot Miner for Low Grade Narrow Tabular Ore Bodies: The Potential and the Challenge.</b> <i>Jeremy Green, Declan Vogt</i>	
	<b>Integrating Two Spectral Imaging Systems in an Automated Mineralogy Application</b> <i>Graeme Hill, Dugal Harris, Jeremy Green</i>	
	<b>Sensory Infrastructure for an Autonomous Self-balancing Mobile Materials Handling Platform</b> <i>Louwrens Butler, Glen Bright</i>	
	<b>Towards the Development of a Multi-Agent Systems based Intelligent Maintenance Management System using the Tropos Methodology</b> <i>De Ville Weppenaar, Herman Vermaak, Johnson Kinyua</i>	
	<b>END-EFFECTOR FOR THE MANUFACTURE OF MULTI GRADED COMPOSITE STRUCTURES</b> <i>Krishnan Kanny, Samuel Dubois Dibwa-kazadi, Avinash Ramsaroop, P. Govender</i>	
12:15 – 13:00	<b>Lunch</b>	
13:00 – 15:15	<b>Parallel Session 2A: Navigation and SLAM</b>	
	<b>An alternative confidence measure for local matching stereo algorithms</b> <i>Thulani ndhlovu, fred nicolls</i>	
	<b>Evaluation of Feature Detection Algorithms for Structure from Motion</b>	

	<i>Natasha Govender</i>	
	<b>Design of an Arbitrary Path-Following Controller for a Non-Holonomic Mobile Platform</b> <i>Deon Sabatta</i>	
	<b>Fast and Robust Road Segmentation and Obstacle Map Generation for Autonomous Navigation</b> <i>Fred Senekal</i>	
	<b>Position Fusion for an Outdoor Mobile Robot</b> <i>Michael Burke, Deon Sabatta</i>	
13:00 – 15:15	<b>Parallel Session 2B: Robotics</b>	
	<b>Kinematics design and visual human motion capture for a humanoid robot arm</b> <i>Chioniso Dube, Jonathan Tapson</i>	
	<b>The Dynamics of an Autonomous Sea Craft for Deep Sea Rescue Operation</b> <i>Chiemela Onunka, Glen Bright</i>	
	<b>Autonomous Underwater Vehicle for Research and Rescue Operations</b> <i>Servaas Holtzhausen, Peter Boscha, Glen Bright</i>	
	<b>Vision Guided Robotics in an Evolvable Manufacturing Environment</b> <i>Vernon Viljoen</i>	
	<b>Artificial Intelligence for the CAESAR robot</b> <i>Riaan Stopforth, Glen Bright</i>	
	<b>Leisure Robotics: an African Child's Gateway to Programming</b> <i>Andrew Cyrus Smith</i>	
15:15 – 15:30	<b>Refreshment</b>	
15:30 – 16:30	<b>Keynote Speaker</b>	Prof Irene Fassi

## 10 November 2009

National Instruments will be hosting 2nd annual Robotics and Mechatronics Seminar and live robotics competition, held this year in collaboration with ROBMECH 2009. At this free, half day event, hear from NI Engineers and learn about innovative approaches to applications in the fields of robotics, mechatronics and autonomous machines, and how these developments can help to reduce costs and improve safety and advance your applications. **For more information visit**

<http://digital.ni.com/worldwide/southafrica.nsf/web/all/05490F257DD479D98625764F001ACF0D>

<b>8:30 - 9:00</b>	Welcome/ Registration	<b>Building 14 F, CSIR</b>
<b>9:00 – 9:45</b>	"Unified Toolchain for Control, Simulation, and Mechatronic Systems"	
<b>9:45 – 10:30</b>	"Overview of Graphical System Design with LabVIEW"	
<b>10:30 – 10:45</b>	Refreshments	
<b>10:45 – 11:20</b>	Presentations from students( TUT, UP and NWU)	
<b>11:20 -12:30</b>	Competition	

## Who should attend?

- Industry, Technical Directors, Manufacturing Managers, Production managers, Technical specialists, Engineers.
- Scientists, Researchers, Students, Engineers, Educators
- Policy makers, Government decision makers, Investors

## Keynote Speakers

### **Dr Davide Scaramuzza**

Born in Terni, Italy, in 1980, Davide received his Master degree (2004) in Electronics and Information Engineering (Summa cum Laude and Dignity of Printing) at the University of Perugia, Italy. His Master thesis won the Aica-Federcomin Award, which is the most prestigious Italian prize for Master theses in the field of Information and Communication Technology.

In February, 2008, he received his PhD (less than 3 years) in Computer Vision and Robotics at the ETH Zurich with his thesis: "*Omnidirectional vision: from calibration to robot motion estimation*". His PhD thesis won the Robotdalen Scientific Award, which is the most prestigious award for PhD theses in the field of Robotics and Automation.

He is currently post-doctoral Fellow at the ETH Zurich, where he is the leader and the Scientific manager of the microFly European project . He is also lecturer of the Master course "Autonomous Mobile Robots" and the leader of the ETH-Maverick team, which won the 2<sup>nd</sup> place at the international competition of Micro Aerial Vehicles in September 2009 with the first purely vision based autonomous helicopter.

He is also the author of the first Omnidirectional Camera Calibration Toolbox for MATLAB (online since 2006). This toolbox has recorded so far more than 10,000 downloads, more than paper 100 citations, hundreds of acknowledgements by satisfied users from all over the world and is also currently used by NASA, PHILIPS, BOSCH, DAIMLER, and CHRYSLER.

### **Dr Irene Fassi**

Responsible and founder of the ITIA-CNR Lab METIS (Mechatronic Technologies and Systems). The Laboratory performs research activities in the field of micro-engineering, including robotics and micro-PKMs. Responsible of ITIA-CNR research activities in the field of micro-engineering and MST.

Research activities include:

#### ***Micro engineering:***

Conception and development of micro-devices with multi degrees of freedom, including feasibility study at MEMS level and modeling of adhesive forces. Analysis of non silicon based manufacturing technologies with particular reference to Micro-handling techniques.

#### ***Kinematics and Dynamics of Parallel Mechanisms and Manipulators***

With particular emphasis on conception, mechanical design and implementation of Parallel Kinematic Machines. Three Parallel Kinematic Machines have been already developed, to be used in different industrial sectors ranging from assembly and shoe manufacturing to models machining"

- Conception and implementation of calibration strategies for Parallel Kinematic Machines;

- Modeling and Control of innovative Robotic Systems
- Modularity and Reconfigurability of machine tools
- Previous research activities included the study of workflow management systems for factory automation, and specifically machine tools builders.

**Dr Giacomo Davide Bianchi**

After an industrial experience, he joined in 1992 the Institute for Industrial Technologies and Automation (in Milano) of the Italian Research Council, where he is responsible for the activities on "Dynamic Analysis and Simulation of Machinery", focused on advanced mechatronic methodologies for numerical and experimental analyses, to support machinery design. Starting from 1998, he teaches a course on "Machine Tools" for the Politecnico di Milano.

His main activities:

- Development of machinery simulation models, including, by a mechatronic system approach, the mechanical structure, the motion control system and the machining process. Spindle modelling.
- Experimental testing of machinery: static stiffness, dynamic compliance, modal analysis, control response.
- Cutting process modelling for milling and turning: process damping, spindle speed variation, development of machine design methodologies for optimal machining capability
- Design of manipulators with parallel kinematic. Volumetric calibration. Definition and analysis of self locking in closed kinematic chains
- Machinery energy consumption

## **Registration Fees**

- R1 000 for delegates
- R500 for students

## **Registration:**

**Please register at <http://armrn.manufacturingafrica.com>**