Newsletter
of the IFAC Technical Committee on Human-Machine-Systems

Issue 2005_3, November ´05

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From the new TC 4.5 Chair 2005-2008

As a new TC 4.5 Chair, I would like to welcome you all!

Well, I am not really new, since I have been serving this post for the last three years. My Co-Chair, Prof. Wan Chul Yoon from the Korea Advanced Institute of Science and Technology (KAIST) is new to this post, but not to the TC 4.5. We have been working together in different fields. I find his nomination a big contribution towards the success of the coming IFAC-HMS 2007 in Korea.

With our combined effort, we hope to be able to bring the TC 4.5 a step further towards solving HMS challenges of today and in the future.

We are counting on you!

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Detlef Zuehlke

Chair IFAC TC 4.5 (HMS)

Reporting on the 16th IFAC World Congress in Prague

The triannual IFAC World Congress was held on July 4-8 this year in Prague. About 2500 participants from different places and disciplines attended the congress. Among the 3250 submitted papers, 2456 were accepted making the acceptance rate of about 75%. A good number of oral presentations (1638) were conducted, accompanied with 778 posters. Unfortunately about 121 Authors of the accepted papers did not show up.

The TC 4.5 took this opportunity to conduct its annual meeting on Tuesday, July 5, which was chaired by Detlef Zuehlke (Chairman). Unfortunately, many members could not find their way to the meeting room due to the somehow confusing navigation directives. After a welcome word from the chairman, the following agenda was followed.

Agenda 1: Report of activities in 2004

A short report of the activities in year 2004 was given by the chairman. This included the HMS Symposium in Atlanta and Masterplan events. A briefing of the Milestone report was done. Further more the T.C has launched a Website (http://www.uni-kl.de/pak/ifac) and a Newsletter to maintain communication among TC members.

Agenda 2: Forth coming events

A number of future events need to be planned. These include:

- The HMS Symposium in Seoul, September 2007,
- the HMS Symposium in France, 2010 and
- the IFAC Word Congress in Seoul in 2008.

Agenda 3: Approval of T.C 4.5 Chairmanship for the next triannial

Prof. Zuehlke was unanimously approved as a chairman of TC 4.5 for the next three years. Prof. Wan Chul Yoon from KAIST/Korea was unanimously elected as Co-Chair.

Agenda 4: Miscellaneous

There was an idea of organizing a joint session with T.C 9.2 on "Social Impact of Automation" during the "9th IFAC Symposium on Automated Systems Based on Human Skill And Knowledge", that will take place in May, 22-24, 2006 in Nancy, France. Another idea was to prepare a collective article on special issues on HMS and publish it for example in the atp international (a new IFAC affiliated journal).

Agenda 5: next meeting

The next TC 4.5 meeting will be held in **Nancy, France** during the IFAC Symposium on Automated Systems Based on Human Skill And Knowledge, that will take place in **May, 22-24, 2006**.

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Kizito Ssamula Mukasa

IFAC TC 4.5 (HMS) Editorial

The Human Machine Interaction Group - University of Modena and Reggio Emilia - Italy

The Human-Machine Interaction (HMI) Group was established by the end of 2002 at the University of Modena and Reggio Emilia, as the result of joint research activities conduced by professors, researchers and PhD candidates of the Department of Sciences ad Methods for Engineering and the Department of Social, Cognitive and Quantitative Sciences.

At a general level, the group's activity consists of studying human factors issues in human-system interaction, designing and developing solutions which allow safe and error-free interaction. A User-Centered Design (UCD) approach is adopted, advancing by iterations of prototyping and user-testing cycles.

The group's competences are drawn from different scientific domains, integrating into a multidisciplinary core of knowledge. Such multidimensional approach is required by the complexity of the problems the group usually has to face: for example, the analysis of an automated system's interactional problems claims for Cognitive and Physical Ergonomics skills; as a proposal for a new user interface must be produced, Interface Design and Rapid Prototyping skills are needed; whenever intelligent features must be introduced into the system, Computer Science is called for; finally, as the newly conceived interface must be tested, experimental; whenever systems should be tailored on users' and environmental requirements, adaptive automation monitoring and implementing skills should be taken into account.

The group's applied research activities cover a wide spectrum of fields. Hereafter are some examples:

- Designing and virtual prototyping of user interfaces.
- Developing innovative interaction technologies, such as haptic- and vocal interaction systems.
- Developing algorithms for information management and interaction modality management.
- Usability testing and analysis.
- Designing and prototyping of distributed software architectures, on-vehicle network protocols and network applications.
- Benchmark analysis of technological devices.

The HMI Group owns laboratory equipment allowing rapid prototyping, development and simulation of user interfaces for industrial environment, on- and off-highway vehicles and embedded systems. Available technologies include SW and HW packages as Altia Design, Vector CANoe, Mathworks Matlab, Simulink, Stateflow, Macromedia Director and others. Prototypes may range from basic simulations for concept demonstration (*early prototyping*) to man- and hardware-in-the-loop systems, integratine information collected from on-vehicle networks and/or ad hoc integrated sensors.

At first, research efforts were focused onto the field of vehicle human factors, both automotive and off-highway.

On the automotive side, issues as the mitigation of drivers' distraction in dual task conditions (i.e.: whenever the driver is performing a secondary task while driving) were investigated; these researches led to designing, developing and testing of systems for on-board information visualization systems.

In 2004, the group was admitted to HUMANIST Network of Excellence, aimed at promoting user-centred design in automotive user-interface design. The HMI group is also involved in the development of a network laboratory aimed at design and developing mechatronic applications, especially in the automotive domain (the Department led this laboratory which is named MECTRON); such participation also provides a strong linkage to local economic system, since Emilia-Romagna – the italian region in which the HMI group resides - aims to represent a pole of excellence for mechatronics and automation. Within this project, the group is currently working to develop a driving simulator which will start to work by the end of 2005.

On the off-highway side, the Group is currently taking part to the Pro-Tract public funded project (http://www.pro-tract.it), aimed at developing a distributed control systems and hybrid CAN / FlexRay network architecture for off-highway vehicles, able to detect and signal potentially harmful driving conditions. Starting from this project, the HMI group is currently laying the foundations for a specific research field dedicated to human factors for off-highway vehicles and machinery. This attempt is witnessed by past and present collaborations with agricultural and off-highway vehicles manufacturers and suppliers: particular attention was paid to the design, rapid prototyping, virtual simulation and testing of on-board displays and information systems, along with the development of innovative interaction devices for on-board instrumentation.

The group's activities also encompass the test-based usability evaluation and re-design of professional industrial software, specifically focusing on Supervisory Control and Data Acquisition systems (SCADA). In this field, experience was gained by taking part to a regional funded project named MOVICONX and to several private funded projects.

Further extensions of the group's activity are currently taking the move, opening to new areas. Particular attention will be dedicated to the development of intelligent interaction systems for biomedical applications, children technologies and risk analysis in the industrial environment.

Besides research concerns, the group is also active in promoting and managing research projects, both on local and European scale: proposals writing, consortia coordination, budgeting, submission and post-submission tracking are consolidated skills of the group.

More information to be found on the website of the group located at http://www.hmi.unimore.it

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Cesare Fantuzzi

Professor at the HMI-Group and Member of the IFAC TC 4.5 (HMS)

Forthcoming events

- INCOM 2006: The 12th IFAC Symposium on Information Control Problems in Manufacturing
  May 17 - 19, 2006, St. Etienne, France
  http://www.emse.fr/incom06/

- The 9th Symposium on Automated Systems Based on Human Skill and Knowledge,
  May 22 - 24, 2006, Nancy, France
  http://www.ensgsi.inpl-nancy.fr/ASBoHS06/

- The 4th IFAC Symposium on Mechatronic Systems
  September 12 – 14, 2006, Wiesloch/Heidelberg, Germany
  http://www.mechatronics2006.com/

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Kizito Ssamula Mukasa

IFAC TC 4.5 (HMS) Editorial.

Editorials

- You are always invited to contribute to the TC 4.5 Newsletter. As usual the main topic is "Human-Machine Systems" and other related topics/events in your field of research/work. Submission deadline for the next TC 4.5 is **February 28, 2006**.
  Please send your article as a MS Word Document to ifac_tc45@uni-kl.de
  Note that your submission requires you to be subscribed to the Newsletter.

- To subscribe to this Newsletter Service, send an email to sympa@uni-kl.de with the subject: **sub ifac_tc45**

- For online reading or downloading of this issue or previous issues, please visit the TC 4.5 website located at http://www.uni-kl.de/pak/ifac