Joint Cognitive Systems: How to design the human place in HRI?

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Workshop on Worker-Robot interaction in manufacturing industry
Karlsruhe, October, 25-26, 2012

Motivation, Background

- Especially in Joint Cognitive Systems, such as socio-technical production systems there is a significant need to focus not only on one subsystem (human or robot) but to have a holistic understanding of the system and its internal and external interactions

New concepts on human-machine co-working?

1. *Are there new concepts on human-machine interaction?*
   Especially in the field of cognitive automation there have to be, since the machine will posses some sort of intelligence

2. *Are these concepts applied to human-robot co-working systems?*
   Hopefully they will be (see motivation)

3. *These concepts are related to complex integrated manufacturing systems?*
   Yes.

4. *Will they have increased impact on future working systems?*
   Hopefully…

5. *<Insert your own question here>*

Examples of new concepts

6. *Language processing? Is it becoming more relevant?*
    Not really in a noisy environment and not unless natural language can be used

7. *How far haptics is a research topic for operator-robot interaction?*
    It is becoming more and more interesting, like in the KUKA-lightweight arm

8. *Is intuitive programming a topic for manufacturing applications?*
    Intuitive and autonomous programming is becoming more relevant than ever

9. *<Insert your own question here>*

Organisational and social dimensions

10. *Does the technology design (robot, system integration, software) have consideration for organisational dimensions? Which are relevant?*
Thinking about production networks, it should have. To mention all the relevant data might take too long...

11. *And does such design have consideration for social dimensions? Which?*
Mostly not, but it should have.

12. *Why that technology design integrates/doesn't integrate such dimensions?*
...

13. *Please, explain for the organisational and the social cases*
In both areas the demographic change might be an interesting factor. Elderly people might need special assisting tools (robots?) as well as adjusted time (organisational)

Workplaces design

14. *Does workplace design implies more interaction of operators with robots?*
It might...

15. *Does workplace design with robots implies different competences from human operators?*
That relies on the robot. There are some studies, that show humans attribute more intelligence to more anthropomorphic robots, hence, there might be higher expectations which need to be adjusted over building up competencies.

16. *Does workplace design with robots implies different responsibilities from human operators?*

17. It does! In case systems are able to learn, there has to be an answer to the question of responsibility.

18. *<Insert your own question here>*

Responsibility of operation

18.	*The location of responsibility lies just with human operators?*
See my last answer... ☺ For sure not!!!

19.	*The location of responsibility lies with the coordinators of human operators?*
Somebody has to be in charge, but who? There has to be a responsibility on many levels such as manufacturer of the robot, operator as well as coordinators etc.

20.	*This concept (responsibility) is not anymore important with autonomous systems. Do you agree?*
Not at all!!!

21.	*<Insert your own question here>*

20. *When a problem (unexpected event) occurs are the operators able to stop the robot operation? Why?*
They have always to have control. However, they need to have competencies to really anticipate if there really is an error or not...

21. *When a problem (unexpected event) occurs the robot operation is self-regulated (no operator intervention is needed)? Why?*
There might be certain classes of "unexpected events" that where anticipated by the programmer and the systems has something like a fail-safe regulation or similar. It really unexpected, there is no way the system can regulate itself

22. *What is the principal innovation related with operator-robot interaction?*
The innovation lies in the fact that the knowledge of the system has to be adjusted to the human operator not the other way round like in a tayloristic manner...

Human-robot interaction (HRI) challenges

23. *What is the principal challenge in the HRI research (all fields)?*
     ...

24. *What is the principal challenge in the HRI in manufacturing environment?*
     To find applications where direct HRI is possible.

25. *Are these challenges tackled in your research group? Why?*
     Due to regulations not at the moment in detail.

26. *<Insert your own question here>*

Main research issues

27. *Please give examples of main projects related with the research on HRI*
ICD-D of the Cluster of Excellence "Integrated production technology for high wage countries" at RWTH Aachen, ProAktiW, Tech4P

28. *Please give examples of main projects related with social sciences research with possible relation with HRI*
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29. *Or give examples of research projects related with complex work systems in manufacturing*
ICD-D of the Cluster of Excellence "Integrated production technology for high wage countries" at RWTH Aachen

Future analysis

30. *Will the topic of operator-robot interaction increase the research interest in the next 5 years?*
I believe so.

31. *Is there a need to support more interdisciplinary research on this issue?*
This question requires a viewpoint that comprises several scientific areas.

32. *The existent research seems to be the needed and sufficient one?*
Yes and no…

33. *Would it improve the research quality if social scientists integrate HRI projects?*
It's worth trying. At least it won't hurt… ☺