



AUTOMATION & CONTROL INSTITUTE
INSTITUT FÜR AUTOMATISIERUNGS-
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Concerning: Dissertation of Mr. Zdenek Maderna

Review

Prof. Pavel Smrz asked me to review and report on the PhD dissertation of Zdenek Maderna with the title "Human – Robot Interaction: Advanced Task – Centered Interfaces for non – Expert Users". I am happy to follow this request and feel confident to provide an expert opinion on the scientific and technical qualities of this work given my background and work in vision for robotics.

Is the topic appropriate to the particular area of dissertation and is it up-to-date from the viewpoint of the present level of knowledge?

The PhD work of the candidate approaches a very relevant topic in robotics, namely the interaction of a human with the robot with the emphasis of opening up robots to non-experts. The candidate included several sections with state of the art in wider perspective as well as more specific to sub tasks. This clearly documents that the candidate has a very good level of knowledge of the field.

Is the work original and does it mean a contribution to the area – specify where the original contribution lies?

The contribution is a mixed reality interface for teaching robot tasks. It combines existing tools in a novel and original way. And it implements tools to realise a step towards more intuitive and easy programming of robots with the goal to enable non-experts to teach a robot task.

Along this development the candidate integrated 3D sensors, 3D displays and touch panels as alternative and complimentary modalities. The work also considers the cognitive abilities of modern robots, which complement the tasks with object recognition and motion planning capabilities. The candidate then proposed a module that assesses the situation. In this way the robot gains a first understanding and awareness of what the user intends to do and, as a consequence, is better able to react to user commands.

Has the core of the doctoral thesis been published at an appropriate level? (The doctoral thesis is required to include reprints or copies with complete bibliographies. A receipt as a proof of admission for publishing at a prestigious forum could also be acceptable.)

The core aspects of the thesis, methods and contributions have been published in three conference articles and a journal publication that has just recently been accepted. The candidate also contributed to four more publications. This is considered appropriate for the field.

Does the list of the candidate's publications imply that he is a person with an outstanding research erudition?

Yes, the candidate displays great understanding and knowledge of related work, the underlying methods and approaches, and the techniques to build novel methods. The document is well structured and the methods are very clearly described, although English grammar and expressions could be improved in several places. The candidate also showed that he could master the state of the art and use this understanding to produce a step forward and adding to the state of the art.

More characteristics of the candidate may be added here.

It is worth to mention that the proposed approach was tested in two widely different applications of service robotics for older adults and in industrial robotics.

The conclusion should contain an explicit statement saying whether, in your opinion, the doctoral thesis meets the requirements of the proceedings leading to PhD title conferment.

In summary, the candidate contributed to a wide spectrum of approaches in human-robot interfaces. The presented thesis shows that the candidate has a very good understanding of the state of the art. The developed methods are scientifically correctly executed and extensively compared. The publications in three conferences and a journal are very well acknowledged.

In conclusion, the doctoral thesis meets the requirements for leading to the title of PhD. I have no doubts that this candidate should be allowed to defend his work to obtain the PhD degree.

Ao. Prof. Dr. techn. Markus Vincze

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