

Opponent's review

Doctorate dissertation of Mgr. Miroslav Behan

Sensorial Networks embedded in Mobile Devices

1. Up-to-date level of the topic, originality

The selected title can be assessed as a novel. The keywords "sensorial networks" show the originality of the work performed. Taking account on the physics and property of reality, mobile devices that are well equipped with ubiquitous sensors has become source of the bases for creation of knowledge-based systems with influence of human potency. The close match to the field of study could be referred to this paper:

Biegel, G.; Cahill, V., "A framework for developing mobile, context-aware applications," in *Pervasive Computing and Communications, 2004. PerCom 2004. Proceedings of the Second IEEE Annual Conference on*, vol., no., pp.361-365, 14-17 March 2004

The formulation of problem is suggested to improve to the specific extent of study rather than it is articulated in a general description.

The proof of concept is demonstrated in two real environments in which the framework help to solve practical issues connected with interactions of human to the sensorial, location based or device relevant information. The research is very interesting and could inspire other researchers to continue the future works highlighted in the conclusions of the thesis.

2. Fulfilment of objectives

The objectives of the dissertation are described in Chapter 2. They include contribution to a series of problems like:

- a) Discover mobile device embedded sensors area
- b) Analyze Sensoric framework which exploits embedded sensors capabilities
- c) Design Sensoric framework with agile development approach
- d) Implement Sensoric framework with state of art development techniques
- e) Test Sensoric framework with real users
- f) Consider areas of usage in real environments
- g) Evaluate Sensoric framework

Throughout the study, fragment of issues produces challenges for new research activities.

The declared objectives can be considered to be reached, bringing mainly a contribution for theoretical applicability of reviewed and developed framework, design and implementation prototype application, prototype testing in real environment supported with result evaluation.

The thesis is inspired from the state-of-the-art of mobile communication technologies. Aims and methods are described; the author represents the ideas and knowledge with some theoretical background. The aims were fulfilled; methods of research work can be improved to achieve the level of doctorate.

3. Obtained results

The result of this thesis is in form of new framework. The selected design solution is agile approach, and it is very interesting to be analysed in the research.

The results of the thesis in form of new approach defined by methods, verified theorems and in basic as an enhancement of grounding theory, bring a set of interesting approaches which can be applied in next development of practical tools and also referenced for the next development of possible extensions based on presented theoretical background.

4. Formal aspects of the dissertation

Formally, this PhD thesis has 101 pages. The manuscript is divided into parts: Introduction, Goal of Research, Problem Definition, Related works, Design of Solution, Implementation, Uses Cases in Real Environment, Discussion of Results, Conclusions and Bibliography.

Introduction states general issues which lead an overview about the topic of study.

Goal of Research outlined a list of main goals. I would rather use term “sub-goals” for the items in the list and adhere to only one main goal. The author introduces term “Senzoric” framework in the list. I suggest that the author define the term whether it is the novel term to be introduced in this field of study or it is an adoption from another language.

Problem definition – This chapter leads the research to the specific area study. Fundamental of sensors with respect to mobile device is described, and supporting evidences are tabled.

Related works - Author has listed 40 references as shown below:

- 1 reference 2001
- 3 reference 2006
- 1 reference 2008
- 2 references 2009
- 3 references 2010
- 12 references 2011
- 2 references 2012
- 4 references in 2013
- 4 online references in 2014
- 1 reference in 2014
- 2 online references in 2015
- 1 reference in 2015


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- 4 online references without year

I suggest that the author increase the number of references to support the argument in problem definition and as well as related works. In my opinion, at the level of PhD, 80 to 100 references are sufficient. I recommend that any material sourced from World Wide Web should include the date of accessed and cited.

Design of Solution - Author is suggested to justify the basis of selecting "agile" approach with citing related prominent references. Author has line up the approach thoroughly.

Implementation – In this chapter, author has shown a decent technical capability. The implementation exhibits the software development life cycle.

The formal level of the thesis is acceptable.

5. Related Publications

The author references ten of publications where he is a co-author. One of the publication is indexed by Thomson ISI Web of Knowledge (8) (IF: 0.805).

Two of the author papers are published under Lecture Note series that are also among five papers published under the renowned Springer publisher.

6. Questions

Q1: What is your expectation on how long that the proposed framework can be sustained against the rapid change of web technologies?

7. Conclusion

The author processed interesting topics in his dissertation and documented his long-term activities in this area.

The submitted doctorate dissertation needs improvement to fulfil the formal and contentual requirements and it is possible to recommend it for the defence.

I am pleased to recommend this thesis for the award of the degree of Doctor of Philosophy conditionally.

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