

Göteborg 2014-04-11

To: Institutionen för informationsteknologi vid Åbo Akademi

**Recommendation of grade for the doctoral thesis of Ville Timonen /  
Förslag till vitsord för Ville Timonens doktorsavhandling**

To start with the most important statements first, it is with great pleasure that, after having reviewed mr Timonen's thesis, I give my full recommendation for its acceptance as a PhD thesis.

*Does the thesis fulfill the scientific requirements for a PhD thesis? / Uppfyller avhandlingen de vetenskapliga krav som ställs på en doktorsavhandling?*

Yes.

The qualifications for a PhD thesis differ slightly between countries and fields. To quantify regarding the number and quality of publications, in several Western European countries, three papers or more, published in the major journals or conferences, is an informal norm as the minimum acceptance level. I have been at the grading committees accepting PhD theses, in graphics, based on three or more publications. Within computer science, at my department, our informal norm is 5-6 papers or more. (A reason is that a PhD-student position lasts 4-5 years, as opposed to 3 years in many other countries.) However, it should be noted that we have many exceptions, and a coherent topic and the quality of the scientific contribution is what is most important.

Timonen's thesis is based on four great papers, and is written as a classic collection thesis, with an overview of his contributions and the publications attached to the end. This is in fact the kind of thesis that my department advocates, in order to maximize the PhD student's research time.

Timonen's thesis has a very clear and delimited topic (in a positive sense). It also brings new strong contributions to the graphics field (see below).

The thesis is very well written. He demonstrates that he masters writing at a high scientific level. Statements and results are apparently correct, which also is proven by the acceptance in peer-reviewed top journals/conferences. The thesis has a highly important scientific contribution, proven by the excellent quality of the journals/conferences.

*Remarks concerning the thesis' status in international research / Ställning som avhandlingen har inom internationell forskning*



# CHALMERS

All four of Timonen's papers are published at the international top conferences. Many conferences have a higher status than journals, in the field of computer graphics. The acceptance rates at the conferences of Timonen's papers were between 20-30% (<http://kesen.realtimerendering.com>), i.e., conferences of excellent quality. It should also be noted that two of mr Timonen's papers have been acknowledged as third best paper and best student paper, respectively. This is highly impressive.

I have today been the opponent at Timonen's defense. I asked several hard and detailed questions about his papers, and Timonen was able to answer with impressive detail. I made excursions outside the main theme of the thesis, and Timonen demonstrated excellent knowledge in a broader range of the computer graphics field. His papers also inspire to further research, and Timonen had himself a number of impressive ideas and suggestions for further (and highly important) directions and initial thoughts of solutions. Timonen demonstrated a very good understanding of the connection between theory (mathematics) and practice (implementations, hardware). This shows that his work and understanding extends far outside the bounds of each of his paper contributions. He proved that he excellently grasps the prerequisites, limitations, and possibilities for his algorithms, even for more remote problems and application areas. He presented his answers extremely well, despite the pressure that a defense would expect to put on a respondent.

This would be a very strong thesis in any international country. Notably is that he is single author on 3 out of 4 papers. Several of the papers would, given their contributions and extensions, normally be expected to have perhaps 3-4 authors. The quality is also proven by the fact that one of the papers is the 3<sup>rd</sup> best paper, among strong international contributions in a top conference, and best student paper. A journal paper was invited to Eurographics (the largest CG conference in Europe). Several researchers regard EGSR to be the best conference in rendering (the main field of Timonen's work). HPG is also one of the top conferences. In fact, I have recently lectured in my Advanced Computer Graphics course, about his first paper.

It is therefore very easy for me to recommend the department council to give Timonen the grade "Med beröm godkânt".



Ulf Assarsson  
Associate Professor  
Phone: +46 701 738535

CHALMERS UNIVERSITY OF TECHNOLOGY  
Department of Computer Science and Engineering  
SE-412 96 Göteborg, SWEDEN  
Visiting address: Rännvägen 6  
Telephone: +46-(0)31 772 1775 Fax: +46-(0)31 772 3663  
Chalmers tekniska högskola AB, Reg. No: 556479-5598, VAT No. SE556479559801  
E-mail: [uffe@chalmers.se](mailto:uffe@chalmers.se)



Åbo, den 11 april 2014

Betygsnämndens rekommendation för betygsättning av Ville Timonens doktorsavhandling

Ville Timonen har lämnat in sin doktorsavhandling i datavetenskap till Institutionen för Informationsteknologi vid Åbo Akademi och har disputerat på avhandlingen den 11 april 2014. Opponent vid disputationen var docent Ulf Assarsson vid Chalmers tekniska universitet. Betygsnämnden för Ville Timonen har deltagit i disputationstillfället. Efteråt hade nämnden en diskussion med opponenter om hans åsikt om den vetenskapliga nivån på avhandlingen och på disputationstillfället. Nämnden har i sin rekommendation även beaktat Ville Timonens handledares åsikter. Ville Timonens handledare är professor Jan Westerholm från Institutionen för Informationsteknologi vid Åbo Akademi.

Betygsnämnden föreslår att Ville Timonens doktorsavhandling bedöms med vitsordet godkänd med beröm av Institutionen för Informationsteknologi vid Åbo Akademi.



Professor Hannu Toivonen



Docent Tomas Eklund

Medlemmar i betygsnämnden



Professor Ralph-Johan Back

ordförande