



**Giovanna Di Marzo Serugendo**  
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**To Whom It May Concern:**

Reviewer Evaluation Report for:

**Danilo Pianini**

**Engineering Complex Computational Ecosystems**

*For the obtention of the PhD degree with label “Doctor Europeus”  
Alma Mater Studiorum Bologna, Italy*

The PhD thesis of Danilo Pianini presents an original contribution in the domain of the engineering of complex computational systems. More precisely this PhD proposes an integrated toolchain for the engineering of these systems, which goes from (meta-)modelling, to programming to verifications. The main particularity and originality is that it addresses the case of chemical-based systems, by integrating a sophisticated model of chemical reactions going beyond rewrite systems, making it suitable not only for engineering and verifying complex computational systems, but also to simulate and understand natural chemical-based phenomena.

I would also like to highlight the fact that this work is very dense, sound and complete, and goes well beyond a single PhD work. It in fact incorporates many works that on their own would justify a PhD (e.g. chemical meta-model, process algebra, simulation tool, aggregate programming language).

The PhD report is very well organized and written. It presents a thorough and detailed state of the art related to the background part on self-organisation as well as specific related works to the different parts of the thesis (e.g. coordination models or aggregate programming), showing the depth of knowledge of the author in these areas.

Results show the soundness and usefulness of the approach. Many applications have been identified on which an innovative solution is found and verified through the PhD thesis proposed toolchain.

Danilo Pianini list of publications is very rich and dense and covers the different aspects of the PhD work. Publications are of very high quality, and appear in diverse well renowned journals and conferences of the area.

The work of Danilo Pianini took place in the framework of the EU-funded SAPERE project, involving five partners from different parts of Europe. This gave the opportunity to Danilo to be exposed to diverse researchers in Europe, to visit them and to write joint publications.

Given all the above, I recommend to award Danilo Pianini the PhD with label “Doctor Europeus”.

Prof. Giovanna Di Marzo Serugendo



DIPARTIMENTO DI INGEGNERIA DELL'ENERGIA ELETTRICA  
E DELL'INFORMAZIONE "GUGLIELMO MARCONI"

Allegato n. 3 - Modello Revisione Tesi di Dottorato

Ph.D. Thesis Title: ENGINEERING COMPLEX COMPUTATIONAL  
ECOSYSTEMS  
PhD Student name: DANILO PIANINI  
Reviewer name: GIOVANNA DI MARZO SERUGENDO  
Reviewer Affiliation: UNIVERSITY OF GENEVA, SWITZERLAND  
Evaluation Report: SEE ATTACHED FILE.

1. Originality of the scientific contribution
2. Presentation of the state of the art and quality of the references
3. Technical soundness
4. Quality/value/impact of obtained results and of publications produced in the PhD period
5. Presentation quality, readability, and manuscript organization

Overall recommendation:

Suggested Improvements:

- o Major recommendations
- o Minor recommendations:

Doctor Europeus:

*Only for those who require the mention the Review shall explicitly mention that the work performed is worth the label "Doctor Europeus" and that the Candidate satisfy the requirements for the label.*

ACCEPT WITH LABEL DOCTOR EUROPEUS.

(This is only a template and can be enriched/ammended by the Reviewer/Supervisor)

*Daniela Serugendo*