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**External Examiners Report**  
**“Connector-Based Performance Data Collection for Component Applications”**  
**by Ing. L. Buleje**

Dear Prof. Nemecek,

This thesis makes a contribution to knowledge in the area of "Performance Measurement Techniques" in component systems, and in particular by proposing a measurement infrastructure, application instrumentation methods and deployment of different applications. Overall this thesis provides a good review of the state of the art and is clearly a scholarly work. I am making the following recommendation:

**The degree should be awarded**

I have come to this conclusion because this thesis shows evidence of independent thought and research. He has further shown clearly that a substantial piece of work had been carried out that is publishable (or indeed has already been published). In my opinion Lubomir has attained mastery of the area in software engineering and that the work is that of the candidate. I do have some minor concerns and comments about the thesis that I have attached to this letter.

If there is any more information required please contact me.

Yours Sincerely



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## External Examiners Report on “Connector-based Performance Data Collection for Component Applications”

### General Questions:

Q 1: From page 28 - start of chapter 2 – the following is stated:

“Concerning the selection of most relevant related works, we are mainly interested in approaches to collection of design-level performance data at application-level, specifically for component-based and distributed applications. Design-level performance data provide information related to the performance of an application as a whole, on the level of abstraction corresponding to basic and potentially dominant building blocks of such applications, i.e. components and distributed objects. Focusing on design-level performance data allows collecting reasonable amounts of performance data even for large applications, in contrast to collecting performance data related to low-level, fine grained, runtime entities responsible for implementation of a particular building block. While the low-level performance data are necessary for performing local implementation-level optimizations, they provide too much detail to be useful for analyzing application-level performance.”

What are the most important characteristics of design level data? Do they differ from the characteristics the lower level data which is mentioned above, required for local implementation level optimizations. In particular what exactly is meant by design level data? And what sort of component level events are felt to be important to capture? Just lifecycle events (e.g. creation and destruction of components) or are there any others?

Q 2: From page 102 there is a discussion about the problems with using a wrapper/proxy based approach versus a connector approach for non-intrusive instrumentation. Is it possible to give the pros and cons of each?

Q 3: Are there results and measurements available from an implementation? In fact is there an implementation of any of this or is there only a description of the design? If there is no implementation then how sure can we be that this will work?

Performance results would be nice to show that the instrumentation design is not flawed somehow. Also with no implementation how can the validation of any of the claims be sustained?

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Q 4: In the abstract it states:

“In this work we propose a generic approach...with the aim to provide easier and less costly access to performance data needed for measurement and model based performance analysis.....”

Where is it shown that the approach is "less costly" and "easier" and how is this validated?

Q 5: Can an indication be given as to the amount of overhead that will be introduced by this design for applications? How can we be sure that this will be accurate?

Q 6: Instead of using connectors is it possible to use AOP to instrument and intercept calls to the components (since libraries are available for most component platforms now)?