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Bridging Design and Deployment using Clustering Modularization Techniques

PROPOSTA DE TRABALHO DE GRADUAÇÃO

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1. Proposal

Since the earliest days of software development, the issue of software modularity has been addressed by the software engineering community. Modularity has been taken by many as quality design objective, since it reflects testability, maintainability, understandability and reusability. Even though it has no single, precise, accepted definition in almost 50 years [01], it has been widely expressed as the property of a system having high cohesion within a component and low coupling between components.

The early researches on this subject spent great effort on reverse engineering techniques. That means, analysis of source code aiming to recover high-level structure of a system – named *re-modularization*. The main reason was that code was usually the only available specification of the system. In the last years several techniques have emerged due to the exponentially growing complexity and size of contemporary systems. From applying clustering techniques at code level features such as data bindings, functions call or even files name [02]; until the use of graph theory at class level [03] and definition of metrics and measures at package level [04]. In such systems, the properties reflected by modularity make its importance undeniable and its achievement a challenge.

This work intends to propose a method to achieve software modularization based on the interaction of the primitive components of a system. From design level artifacts, like UML sequence diagrams and some information about the data coupling between these objects we intend to determine which is the most suitable partition that minimizes this data coupling between components. Our intention is to use such results to establish a bridge between design and deployment in the context of mobile systems. The resulting deployments would bring a reduction of network costs and an increase of service quality, among other benefits.

2. Chronogram

The following table presents the chronogram for this work.

Activity	March				April				May				June			
Software Modularization Research	X	X	X	X	X	X										
Method Proposal							X	X								
Method Analysis								X	X							
Final Work Elaboration									X	X	X	X	X	X		
Revision															X	X

References

[01] H.Melton and E. Tempero, *"Towards assessing modularity"*, IEEE First International Workshop on assessment of Comtemporary Modularization Techniques, 2007

[02] J. Davey and E. Burd, *"Evaluating the Suitability of Data Clustering for Software Remodularization"*, Proceedings of the Seventh Working Conference on Reverse Engineering (WCRE'00), 2000

[03] A. Chatzigeorgiou, N. Tsantalis, G. Stephanides, *"Application of Graph Theory to OO Software Engineering"*, WISER'06, May 20, 2006

[04] H.Melton and E. Tempero, *"The CRSS Metric for Package Design Quality"*, Australiasian Computer Science Conference 2007

[05] L. Yu and S. Ramaswamy, *"Verifying Design Modularity, Hierarchy, and Interaction Locality Using Data Clustering Techniques"*, ACMSE 2007