

University of Groningen

Applying patterns in embedded systems design for managing quality attributes and their trade-offs

Feitosa, Daniel

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version

Publisher's PDF, also known as Version of record

Publication date:

2019

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Feitosa, D. (2019). *Applying patterns in embedded systems design for managing quality attributes and their trade-offs*. University of Groningen.

Copyright

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license. More information can be found on the University of Groningen website: <https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment>.

Take-down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.

Stellingen

behorende bij het proefschrift

Applying Patterns in Embedded Systems Design for managing Quality Attributes and their Trade-offs

van

Daniel Feitosa

1. Apart from improving the structure of a software system, the use of design patterns can also promote quality attributes such as correctness, performance, and security.
2. Classes that do not participate in GoF design patterns instances are more probable to violate good coding practices that impact runtime quality attributes.
3. Classes that participate in single pattern instances exhibit higher levels of quality compared to classes that participate in coupled pattern instances.
4. The structural complexity and change-proneness of a pattern-participating class are inversely correlated with their quality as expressed through the number of violations of good coding practices.
5. The use of design patterns does not necessarily incur greater energy consumption. Design solutions that are more complex in terms of lines of code and method invocation may consume as much or even less energy than an equivalent non-pattern solution.
6. In industrial software systems, pattern grime accumulates in a linear fashion. Factors such as the type of pattern, the type of project and the developers themselves can influence the rate of grime accumulation.
7. The levels of correctness, performance and security are correlated with the deterioration of design pattern instances through pattern grime.
8. Quality attributes that are not of paramount importance to critical embedded systems, such as reusability, are more commonly compromised in favor of critical quality attributes, such as correctness, performance and security.
9. Perspective is a powerful tool for a researcher; or any person. The essential problem and involved variables do not change, but finding an appropriate point of view to work with them may make the difference between halt and accomplishment.