

In the context of the expertise group Software Engineering & Technology (SET) and the Laboratory for Quality Software (LaQuSo), both of the TU/e Department of Mathematics and Computer Science, the following M.Sc. thesis proposal is available for students with an interest in software quality assessment and software tooling. The project will be supported by

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## Software Maintainability Assessment Framework

Software maintainability is broadly accepted as an important quality attribute of software system. Assessing maintainability is, however, a notoriously difficult task: translating a rather vague notion of what is and what is not maintainable to a series of measurements remains a challenge despite numerous efforts found in the literature. A promising approach developed in this field are quality models [1-5] which aim at describing complex quality criteria by breaking them down into more manageable sub-criteria. Unlike the existing approaches, this work will not try to assess quality of the sub-criteria solely based on metrics. We strongly believe that combining metrics with visualization-based approaches can provide a key to assessing maintainability.

The graduation project proposed will consist of the following steps:

1. Identification of relevant maintainability sub-criteria based on the literature.
2. Overview of available visualization-based maintainability assessment techniques (e.g., visualization of dependencies, code duplication or metrics evolution).
3. Composition of a sub-criterion – assessment technique mapping matrix.
4. Validation of the matrix-based approach by applying it to assess maintainability of an industrial-size software system.

See also:

1. B.W. Boehm, J. R. Brown, H. Kaspar, M. Lipow, G. J. Macleod, and M. J. Merrit. *Characteristics of Software Quality*. North-Holland, 1978.
2. R. G. Dromey. *A model for software product quality*. IEEE Trans. Softw. Eng., 21(2), 1995.
3. *ISO 9126 Software Quality Model*
4. R. Marinescu and D. Ratiu. *Quantifying the quality of object-oriented design: The factor-strategy model*. In WCRE 2004. IEEE CS Press, 2004.
5. M. Broy, F. Deißeböck, and M. Pizka. *Demystifying maintainability*. In Proceedings of the 4th Workshop on Software Quality, Shanghai, P.R.C., 2006. ACM Press.