

Abstract of paper presented at the IWSM, Ankara, October 2013

Fast Functional Size Measurement with Synchronous Languages

An approach based on LUSTRE and on the COSMIC ISO 19761 standard

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Abstract

Functional size measurement is considered a complicated, tedious and time-consuming task when performed manually. Automating FSM is one solution to help in applying it and using it. Another solution is designing simple and easy-to-apply FSM procedures. The Synchronous Languages (SL) are built on solid mathematical foundations and used for correctly designing safety-critical reactive real-time systems. They are known for their strong semantic soundness, allowing the design of explicit safely-constructed formal models where the interpretation of a model is unique and reader-independent. These properties are very useful in the context of FSM because they help create simple FSM procedures and hence speed up the measurement process. In this paper, we propose a fast functional size measurement (FSM) procedure, based on the COSMIC method -ISO 19761, for safety-critical real-time systems described with the synchronous language LUSTRE.

Keywords - Synchronous Languages; LUSTRE; SCADE; Functional size measurement; real-time systems; safety-critical systems; COSMIC ISO 19761

The full paper should be available from IEEE Explore www.ieeexplore.ieee.org/Xplore