Structural synthesis of programs from refined user requirements (Programming boiler control in NUT)

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Abstract

The aim of this work is to demonstrate the feasibility of using a declarative language as a tool for automated implementation of requirements written in a semiformal manner. The technique of structural synthesis of programs based on automatic proof search in intuitionistic propositional calculus implemented in the NUT system is used for solving the steam-boiler problem. The goal of the experiment is to bridge a gap between the language of requirements and an implementation. An appropriate set of concepts is developed for representing the problem, i.e. writing the requirements in a form understandable by the program synthesis tools. A complete implementation, including simulator of the actual steam-boiler and control panel, is written in NUT.