

AUTOMATED RECOVERY OF ARCHITECTURAL INFORMATION FROM SOURCE CODE (AREAS)

Goal of the project:

The goal of the project is to develop and validate automatic recovery methods of the architectural information from the code, which is an important activity for program comprehension. Program comprehension, an essential prerequisite for any maintenance activities, consumes a significant part of software budgets. Supporting the program comprehension activity by intelligent tools is an important mechanism for cost reduction.

Short description of the project:

The project developed the AREAS technology, which comprises: establishing the primary artifacts that must be considered in the recovery process, the framework that captures which are the relevant relationships between them, and the algorithms that work best for abstracting or extracting architectural information.

Project implemented by

The project was implemented by a team from the Department of Computer and Information Technology, Politehnica University Timișoara.

Implementation period:

August 2017–December 2018

Main activities:

Phase 1 activities:

- A1.1. The development of initial methods for architectural information recovery from the source code
- A1.2. The development of the experimental methodology and of the evaluation tools for the experimental results
- A1.3. The design of the software tool prototype architecture
- A1.4. The enhancement and extension of the architectural information extraction methods from the source code

Phase 2 activities:

- A2.1. Test Case selection and preprocessing
- A2.2. Experimental validation of the architectural information recovery methods
- A2.3. The development and integration of architectural components of the AREAS software tool prototype
- A2.4. Validation of the integrated recovery technology of the architectural information from the source code
- A2.5. AREAS software tool validation
- A2.6. Results dissemination

Results:

Following results were obtained:

1. Development of methods for recovery of architectural information. This comprises: identifying the primary artifacts that must be considered for a successful recovery process and the relevant relationships between them, and development and synergic combination of the best algorithms and techniques from both the extractive and abstractive approaches.
2. Experimental validation of the methods for recovery of architectural information. This will also lead to creating a repository of test cases for architectural recovery from selected, analyzed and preprocessed relevant industry-size software systems, start a set of benchmarks for this domain.
3. Design, implementation and validation in the lab of the AREAS (Automated Recovery of Architectural Information from Source Code) tool and validation of the integrated AREAS technology for architectural recovery.

Applicability and transferability of the results:

As a result of this project, the AREAS (Automated Recovery of Architectural information from Source code) technology was advanced from TRL2 (technology concept formulated) at the beginning of the project to TRL4 (technology validated in the lab) at the end of the project. The project produced documented experimental results validating the proposed methods on extensive case studies. The project has built a prototype of the integrated AREAS tool, having the architectural design and main components integrated and functionally validated by applying the tool on a set of relevant industry-size software systems.

Financed through/by

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