↺ Content archived on 2024-06-18

erc
European Research Council
Established by the European Commission

ScalPL : A Scalable Programming Language

Results in Brief

A boost for scalable programming languages

An EU initiative advanced the state of the art in domain-specific languages (DSLs). These programming languages are capable of simplifying complex code, fostering good communication with customers, boosting productivity or freeing development bottlenecks.

⚙️ **INDUSTRIAL TECHNOLOGIES**
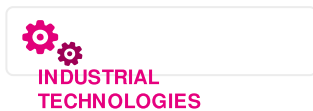
© Shutterstock

Thanks to EU funding, the SCALPL (ScalPL: A scalable programming language) project undertook research that focused on techniques to make DSLs easier to implement, compose and reason about. It developed a framework for extensible language and various influential programming methods for DSLs.

Project partners addressed whether feature-oriented programming (FOP) can avoid code clones or whether it facilitates FOP-related clones. They analysed 10 feature-oriented software product lines concerning code cloning. Results show there are many clones in such lines and the majority of them are FOP-related. Then they demonstrated how the clones can be removed by applying refactorings.

In other research, the SCALPL team incrementalised programmes through their derivative. The derivative maps changes in the programme's input directly to

modifications in its output without reexecuting the initial programme. Team members presented a programme transformation that takes programmes to their derivatives. This is fully static and automatic, supports first-class functions and produces derivatives that are responsive to normal optimisation.

To investigate performance, project members carried out a case study by implementing the programme transformation on a general-purpose programming language. Running time was improved by over four orders of magnitude.

Researchers also looked into the development of complex software applications, which sometimes lead to long restarts in testing new programme parts.

Current approaches to dynamic software updates have flexibility or performance limitations. To deal with this issue, they introduced a runtime update approach based on a general-purpose computer programming language that offers flexible dynamic software updates, is platform independent, introduces only minimal performance overhead and does not dictate the programme architecture. The approach's applicability and performance was assessed and compared with current dynamic software update approaches.

With a method that emphasised scalability, SCALPL should contribute to a profoundly new approach to programming.

Keywords

Scalable programming language   domain-specific languages   SCALPL

feature-oriented programming   derivative

Discover other articles in the same domain of application

Middleware system utilises AI to coordinate building energy management

8 May 2020

Electron beam melting technology takes to the air

6 September 2019

Cell function profiling to assess clone stability in drug bioreactors

31 January 2020

Smart robots master the art of gripping

29 August 2018

Project Information

SCALPL

Grant agreement ID: 203099

Project closed

Start date
1 October 2008

End date
30 September 2014

Funded under
Specific programme: "Ideas" implementing the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007 to 2013)

Total cost
€ 1 382 680,00

EU contribution
€ 1 382 680,00

Last update: 15 September 2016

Permalink: https://cordis.europa.eu/article/id/188544-a-boost-for-scalable-programming-languages