

# Source Code Analysis and Manipulation

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## 1 Introduction

The special section contains nine papers which are extended versions of papers originally published in the proceedings of the IEEE workshop on Source Code Analysis and Manipulation (SCAM 2004). The papers cover the spectrum of analysis and manipulation work from traditional transformation application areas concerned with optimisation through to more novel application areas such as transformation for evolution of websites; they cover the use of linguistic source code aspects which arise from the semantics of the language to more ephemeral, yet higher level domain-related information.

The special issue brings together work on algorithms, tools, empirical results and novel approaches to source code analysis and manipulation. There are five papers on analysis and four on manipulation in this special issue. The next two sections describe the papers on analysis and manipulation respectively.

## 2 Analysis Papers

The papers by Souter and Pollock, Anderson et al. and Chen et al. concern traditional issues of control and data flow, while the paper by Antoniol et al. concerns the application of control, data flow and metric information to the problem of clone detection. Finally the paper by Van De Vanter presents a different perspective in which the subject of the analysis is the information locked in the natural language parts of the source code.

The paper by Souter and Pollock concerns the problem of more precise analysis of call graphs. For traditional 3GL languages this problem is largely straightforward. However, for Object Oriented (OO) languages, there arises a possibility that many static call chains may not be possible. Of course, determining an infeasible call path is generally not decidable [8], but Souter and Pollock use safe approximation based upon type information. They implemented their algorithm and used it to analyse several programs, revealing that up to 10% of the call paths are infeasible according to their analysis.

This may appear, at first sight, to represent only a small improvement. That is, 10% may appear to be a relatively modest precision improvement. However, one has to bear in mind that the analysis which produces call graphs is at a relatively coarse granularity and many subsequent analyses will depend upon it. Therefore, imprecision in the call graph may lead to knock-on amplification in imprecision for subsequent finer-grained analyses. Also, the authors indicate that the programs they studied did not make heavy use of the OO features which lead to type infeasible call chains. It is therefore possible to (cautiously) conclude that the initial result of 10% may reflect a lower bound on the level of imprecision which can be ameliorated by detection of infeasible call chains.

The work of Chen et al. also attempts to improve analysis efficiency by detecting infeasible aspects of programs. In this case the problem is to determine which statements are dead. In a traditional sequential program, such a problem is that of determining infeasible paths in a Control Flow Graph, which is analogous to the infeasible call-path problem addressed by Souter and Pollock. In the world of concurrent programs, the problem is more complex because of the possibility of non-determinism. In this world, the problem of

# Source Code Analysis And Manipulation Proceedings

**Siddappa N.Byrareddy**



## **Source Code Analysis And Manipulation Proceedings:**

## **Source Code Analysis And Manipulation Proceedings** Book Review: Unveiling the Magic of Language

In an electronic digital era where connections and knowledge reign supreme, the enchanting power of language has become much more apparent than ever. Its ability to stir emotions, provoke thought, and instigate transformation is actually remarkable. This extraordinary book, aptly titled "**Source Code Analysis And Manipulation Proceedings**," written by a highly acclaimed author, immerses readers in a captivating exploration of the significance of language and its profound impact on our existence. Throughout this critique, we will delve into the book's central themes, evaluate its unique writing style, and assess its overall influence on its readership.

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