

# Research Statement for IFIP WG 2.11

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## 1. Program Transformation

Program transformation aims at increasing programmer productivity by automating programming tasks, thus enabling programming at a higher-level of abstraction, and increasing maintainability and re-usability. Many systems for program transformation exist that are often specialized for a specific object language and/or kind of transformation. All these systems share many ideas about program transformation and use similar techniques, but are often ad-hoc in many respects. The goal of my research in this area is to achieve a specification language or family of specification languages for the high-level specification of program transformation systems in which generic, language independent schemas of transformation can be captured, and which admits efficient implementation of those transformations that scale to large programs.

In the StrategoXT project we are developing Stratego, a transformation language based on the paradigm of term rewriting with programmable rewriting strategies, and the XT toolset, supporting the syntactical infrastructure of transformation systems. The toolset includes an optimizing compiler for Stratego programs.

The strategic program transformation techniques are being applied in various application areas. One area of particular interest sets out to validate the claim that transformation strategies support concise implementation of compiler optimizations.

## 2. Software Configuration

Managing the variability in software systems is rapidly becoming an important factor in software development. Instead of developing and deploying a fixed one-of-a-kind system, it is now common to develop a family of systems whose members differ with respect to functionality or technical facilities offered.

In the TraCE project we study the modeling and realization of variability in modern software systems with an emphasis on a more general and generic treatment of timing-issues for variant addition/removal and binding of variation points, the related effects and the opportunities for optimization. The vehicle for the research is the development of a framework for transparent configuration environments which present a uniform interface to a variety of underlying configuration mechanisms, thus closing the current gap between variability at the conceptual and implementation levels.