The goal of the Recast project is to support the evolution of object-oriented applications by focusing on three main directions: reverse engineering and reengineering, versions analysis, and migration towards components. As we are part of the Software Composition Group of the University of Bern, we worked on topics related to the Recast project but also on topics related to the project “Tools and Techniques for Decomposing and Composing Software”\(^1\) (TTDCS in the rest of this document). Therefore this report also lists the results obtained in the context of language design. Note that they are listed here to show that we got other results but they will be described in the detail in the TTDCS scientific report.

1 Results

The current results of the Recast project are:

- the identification of the key infrastructural design variations that have to be taken into account when developing reengineering environments. Indeed, most of the time reengineering environments are built without a clear analysis of the impact of the representation choices. The analysis we elaborate will serve as a basis to understand the concerns that have to be taken into account when designing new reengineering environments [5] [2].

- the development of a reengineering environment. We have extended MOOSE, our reengineering environment to support the analysis of versions. We are working on the analysis of new languages such as Java.

- the definition of new visualizations techniques for both system-wide and class-based understanding [1], [4], [6]. The work developed in [1], [6], and [4] while offering different solutions focuses on the same problem: how to support the understanding of classes. The first one uses Formal Concept Analysis to identify semantical clusters while the second presents how a visualization of a call-flow enriched with semantical information offers views which support the oppor-
tunistic reading of the code. Finally in [4] we present how simple but scalable
visualization techniques enriched with metric information support the perception
of large systems. Note that Software-Tomography a professional environment
started to use this idea.

We are currently working on the identification of trends in evolution, the def-
inition of techniques to support the modularization of software, the use of formal
techniques such as clustering analysis to support the understanding and clustering of
object-oriented applications. We expect to have some significant publications on these
topics within a year.

Contributions of Collaborators.

Mr. Girba developed the HisMo model to analyze evolution trends in large object-
oriented systems. We are in a bootstrap phase (we collected case studies, de-
gined a suitable meta-model for history analysis, and submitted a first paper)
and we are now ready to perform a lot of experiments to validate our hypotheses.

Mr. Galli is working on the analysis of tests. The idea is to prioritize failed tests in
terms of their relevance to a given problems based on their coverage to offer to
the developers the tests that are the most important to fix first.

Important Events.

- Organization of two workshops at the European Conference on Object-Oriented
  Programming ECOOP’2003: Object - Oriented Language Engineering in Post -
  Java Era and Object - Oriented Reengineering.

- Organization of the Annual European Smalltalk User Group Conference. Chair
  of the Academic Track, editor of the special issue of the journal Computer Lan-
  guages from Elsevier.

- Michele Lanza whose PhD was co-supervised with O. Nierstrasz received the
  Denert Software-Engineering prize 2003 for his PhD.

Workshop Proceedings.

Wolfgang Demeuter and Stéphane Ducasse, Theo D’hondt and Ole Lehmman Mad-
сен, Report of the ECOOP’03 Workshop on Object - Oriented Language Engi-
neering in Post - Java Era, In Object - Oriented Technology (ECOOP’03 Work-
shop Reader), LNCS (Lecture Notes in Computer Science), Springer - Verlag,
2003.

Serge Demeyer and Stéphane Ducasse and Kim Mens, Adrian Trifu and Rajesh Vasa,
Report of the ECOOP’03 Workshop on Object - Oriented Reengineering, In
Object - Oriented Technology (ECOOP’03 Workshop Reader), LNCS (Lecture
Notes in Computer Science), Springer - Verlag, 2003.
2 Publications

As we are part of the Software Composition Group of the University of Berne, we worked on topics that are related to the evolution of object-oriented applications but also on topics related to the project “Tools and Techniques for Decomposing and Composing Software” (SNF Project No. 2000-067855.02, Oct. 2002 - Sept. 2004) (TTDCS).

To avoid discriminating one or other of the projects, we decided to clearly separate the publications. We selected as RECAST publications results related to reengineering and evolution publications and we selected as TTDCS results related to language design to TTDCS. For these papers we only list them here and they will be joined to the TTDCS report.

2.1 Recast Publications


In Print. We got accepted articles that are in print or that have been published after the 1st of September 2003. They will be joined in the 2003-2004 report. Still we want to show that we got some results therefore we join as physical copies [4] and [5] as they are in print.


Recast Related Publications

Here are the publications that are related to RECAST but are part of the TTDCS report.


2.2 Other publications

Here are the publications that we obtain in the context of the TTDCS project. They are mainly related to new language features.


In print


[17] Andrew P. Black, Nathanael Schärli and Stéphane Ducasse, Applying Traits to the Smalltalk Collection Hierarchy, Proceedings OOPSLA 2003, 2003, 26 accepted papers on 142 = 18 %