Intermediate Scientific Report of

A Framework Approach to Composing Heteregeneous Applications
FNRS Project No. 20-53711.98

November 23, 1999

1 Results Description

1.1 Piccola

Piccola is a general composition language. It supports the definition of different architectural styles in which components can be scripted [**ALSN99**],[Lum99] [Sch99]. Piccola's formal semantics is given in terms of the piL-calculus [**LAN99**]. We are working on a type system for the calculus [**Lum99**]. We have used the formalism of the piL-calculus to define a metamodel for object-based programming.

1.2 CoLaS

In the CoLaS model we integrate coordination into an object-oriented programming language itself. In CoLaS the coordination is based on the notion of Coordination Groups [**CD99b**]. We are extending the CoLaS model in the context of distributed object-oriented programming environment [CD99a].

1.3 Coordination Framework

In [**TCD99**] we present a series of guidelines for developing component frameworks in which coordination is an issue. In [Küh98] we present a coordination medium for distributed application that extends the notion of *tuple spaces* to *form spaces*, with corresponding advantages for flexibility and extensibility.

2 Publications

The publications listed below are for the period from the beginning of the project until September 30 1999. The publications in bold are included with this report and cover the period from September 30 1998 to September 30 1999. The other publications

have already been submitted with the previous (intermediate) report for this project. The publications presented in bold are joined to this report.

As the Famoos Esprit Project is related to the described project, we include the list of publications related to the Famoos project.

FNRS Related Publications

[ALSN99] **Franz Achermann, Markus Lumpe, Jean-Guy Schneider, and Oscar Nierstrasz. Piccola - a small composition language. In Howard Bowman and John Derrick., editors, *Formal Methods for Distributed Processing, an Object Oriented Approach*. Cambridge University Press., 1999. to appear.**

[CD99a] Juan-Carlos Cruz and Stéphane Ducasse. Coordinating open distributed systems. In *Proceedings of International Workshop in Future Trends in Distributed Computing Systems'99*, 1999.

[CD99b] **Juan-Carlos Cruz and Stéphane Ducasse. A group based approach for coordinating active objects. In *Proceedings of Coordination'99, LNCS 1594*, pages 355–371, 1999.**

[LAN99] **Markus Lumpe, Franz Achermann, and Oscar Nierstrasz. A formal language for composition. In Gary Leavens and Murali Sitaraman, editors, *Foundations of Component Based System*. Cambridge University Press., 1999. to appear.**

[Lum99] **Markus Lumpe. Automatic type reconstruction for a process calculus with records, 1999. Working Paper.**

[TCD99] **Sander Tichelaar, Juan Carlos Cruz, and Serge Demeyer. Design guidelines for coordination components. working paper, University of Bern, March 1999.**

Famoos Esprit Project Related Publications

[DD99] Serge Demeyer and Stéphane Ducasse. Metrics, do they really help? In Jacques Malenfant, editor, *Proceedings LMO'99 (Languages et Modèles à Objets)*, pages 69–82. HERMES Science Publications, Paris, 1999.

[DDL99] Serge Demeyer, Stéphane Ducasse, and Michele Lanza. A hybrid reverse engineering platform combining metrics and program visualization. In Francoise Balmas, Mike Blaha, and Spencer Rugaber, editors, *WCRE'99 Proceedings (6th Working Conference on Reverse Engineering)*. IEEE, October 1999.

[DDN99] Serge Demeyer, Stéphane Ducasse, and Oscar Nierstrasz. Finding refactorings via change metrics. working paper, April 1999.

[DDT99a] Serge Demeyer, Stéphane Ducasse, and Sander Tichelaar. A pattern language for reverse engineering. In Paul Dyson, editor, *Proceedings of the 4th European Conference on Pattern Languages of Programming and Computing, 1999*, Konstanz, Germany, July 1999. UVK Universitätsverlag Konstanz GmbH.

[DDT99b] Serge Demeyer, Stéphane Ducasse, and Sander Tichelaar. Why unified is not universal. UML shortcomings for coping with round-trip engineering. In Bernhard Rumpe, editor, *Proceedings UML'99 (The Second International Conference on The Unified Modeling Language)*, LNCS 1723, Kaiserslautern, Germany, October 1999. Springer-Verlag.

[Dem99] Serge Demeyer. Structural computing: The case for reengineering tools. In Peter Nuernberg, editor, *Proceedings of the 1rst Workshop on Structural Computing – Hypertext'99*, February 1999.

[DRD99] Stéphane Ducasse, Matthias Rieger, and Serge Demeyer. A language independent approach for detecting duplicated code. In Hongji Yang and Lee White, editors, *Proceedings ICSM'99 (International Conference on Software Maintenance)*, pages 109–118. IEEE, September 1999.

[RD99] Tamar Richner and Stéphane Ducasse. Recovering high-level views of object-oriented applications from static and dynamic information. In Hongji Yang and Lee White, editors, *Proceedings ICSM'99 (International Conference on Software Maintenance)*, pages 13–22. IEEE, September 1999.

[Ric99] Tamar Richner. Using recovered views to track architectural evolution. In *to appear in ECOOP'99 Workshop Reader*. Springer-Verlag, June 1999.

[TD99] Sander Tichelaar and Serge Demeyer. Sniff+ talks to rational rose – interoperability using a common exchange model. In *SNiFF+ User's Conference*, January 1999. Also appeared in the "Proceedings of the ESEC/FSE'99 Workshop on Object-Oriented Re-engineering (WOOR'99)" – Technical Report of the Technical University of Vienna (TUV-1841-99-13).

Master's and PhD Theses

[Hel96] Michael Held. Analyse der erstellung eines help-dokumentes. Informatikprojekt, University of Bern, August 1996.

[Küh98] Daniel Kühni. *APROCO: A Programmable Coordination Medium*. Diploma thesis, University of Bern, October 1998.

[Lum99] Markus Lumpe. *A Pi-Calculus Based Approach to Software Composition*. Ph.D. thesis, University of Bern, Institute of Computer Science and Applied Mathematics, January 1999.

[Sch99] Jean-Guy Schneider. *Components, Scripts, and Glue: A conceptual framework for software composition.* Ph.D. thesis, University of Bern, Institute of Computer Science and Applied Mathematics, October 1999.

Other Publications

[Dem97] Proceedings of the ECOOP'99 workshop on object-oriented architectural evolution, June 1997.

[DG99] Serge Demeyer and Harald Gall, editors. *Proceedings of the ESEC/FSE'99 Workshop on Object-Oriented Re-engineering (WOOR'99).* TUV-1841-99-13. Technical University of Vienna - Information Systems Institute - Distributed Systems Group, September 1999.

[DG00] Serge Demeyer and Harald Gall. Workshop on object-oriented re-engineering (WOOR'99). *Software Engineering Notes*, 25(1), January 2000.

[MD99] Ana Moreira and Serge Demeyer, editors. *Object-Oriented Technology (ECOOP'99 Workshop Reader).* LNCS. Springer-Verlag, Kaiserslautern, Germany, December 1999.

[Nie99] Oscar Nierstrasz. Identify the champion. In N. Harrison, B. Foote, and H. Rohnert, editors, *Pattern Languages of Program Design*, volume 4. 1999. to appear.