

Travel Report

Project VODA on "Grammar-Based Systems"

8th October, 2005

Travel Details

Destination

University of Maribor, Maribor–Slovenia

Date

04 to 09 October, 2005

Visitors

Pedro Henriques / UM (Portugal)

Maria João Varanda / IPB (Portugal)

Travel Purpose

The main purpose of this visit was to continue the joint work in the bilateral project "VODA – Grammar Based Systems" started at Braga last December, as described below.

Financial Support / Grant

Portuguese GRICES and Slovenian Government under a bilateral agreement for joint research projects support (project No. BI-PT/04-06-008).

Travel Report

Aims & Objectives

As planned in the report of the previous working visit, Slovenian team has visited Braga in July to attend the GTTSE Summer School. There, we reserved some time for a short meeting to discuss undergoing work on VODA project. All of us agreed that the progress was null. The task defined as future work in that report:

- to search for different case studies or problems in order to define common characteristics that will be used to construct the decision tree
 - to find papers about GBS in the literature and to write the state-of-the-art section (4.1)
 - to search for problems and try to apply the grammar-based approach
 - to define a set of assessment criteria
 - to assess the adequacy of the solutions and identify patterns

has not been accomplished. Some reasons were found—aims of the research were too wide, and were not very clear, the motivation was not strong enough, etc.—but it was clear that we should redefine the project direction, and we should find a new and more specific subject (of course under the general umbrella of *Grammar-based Systems*).

Even during the Summer School we decided to explore the intersection of AOP with Attribute Grammars.

So the main objective for this visit was:

- to discuss the new paradigm *Aspect Oriented Programming*, and study *its extension to Attribute Grammars (language definitions, in general)* in order to investigate if the extension makes sense, and if we can come out with some real contribution to the work of Language Designers.

We also planned to:

- give an introductory lecture (general overview, basic concepts and motivation) to the class of the Compiler Course (undergraduate students) Marjan is responsible for.
- update the knowledge about the projects undergoing in both Partners' Laboratories (University of Maribor and University of Minho).

Achievements

All the objectives listed above, were achieved—the meeting was indeed successful.

The lecture was given—Pedro introduced the compilers area and presented a first example on the compiler for LISS programming language, and Maria João completed the motivation, discussing seven examples of DSL's and their processors.

Besides that, the work done can be described as follows:

- Damjan gave a talk (slides are enclosed) on Aspects on programming languages in general, and AspectJ in particular, and presented the state of the art in Aspects on language definitions; the main contributions on this field—AspectASF, AspectStratego, and JastAdd—were reviewed. The Damjan argued that *templates* in LISA are a kind of Aspects, and he took the Robot language definition to propose a way to include Aspects in LISA (he called it AspectLISA).
- After a long discussion, we recognized the validity of our working hypothesis: aspects can be used for semantic language definitions with the main benefit of a clear separation of concerns.
- We also discussed the basic constructors that should be included in AspectLISA, their concrete syntax and semantics, and we raised up some other interesting possibilities to be explored in the future.
- We started a new paper (herewith enclosed), with title *AspectLISA: an aspect oriented compiler construction system based on attribute grammars*, to report all the outcomes listed in the previous items.
- Concerning ongoing projects, we just discussed briefly the novelties and we listen to a talk by a Master Student (Ivan) on *Ant colonies optimizations*.

We also updated the Project WebPage, and archive the new files in the CVS system.

Future Work

According to the fruitful discussion on Aspects in Language Development, we will develop the proposal of AspectLISA—an extension to the Compiler

Generator LISA with mechanisms to define and use aspects in the semantic specifications—that was sketched during this visit.

To achieve that, the work will have two components, one more theoretical and the other practical.

On one hand, both teams will be involved in finishing the paper, started now, in order to submit it (in December, 1.st) to LDFA. As the paper was completely structured, each section/subsection was assigned to one of the partners.

On the other hand, Damjan (and the Slovenian team) will work on the implementation of those ideas in LISA system, to make test and obtain some pragmatic feedback to include in the paper in order to corroborate the AspectLISA proposal.

Next Meeting

- Slovenian team will visit Braga in December.