

Travel Report

”Grammar-Based Systems” Project

18th December, 2004

Travel Details

Destination

University of Minho, Braga–Portugal

Date

13 to 19 December, 2004

Visitors

Tomaž Kosar / UMaribor (Slovenia)

Damijan Rebernak / UMaribor (Slovenia)

Travel Purpose

The main purpose of this visit was to continue joint work in the bilateral projects “Automatic generation of Language-based Tools” (in a final phase) and “Grammar Based Systems” (in an initial phase), 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

The objectives were:

- to discuss directions of research, based on the various outcomes produced during the previous visits as a result of the join research so far developed, for immediate and future work,
- to define a new editing policy to improve collaborative work,
- to define new tasks to improve project visibility,
- to update the knowledge about the projects undergoing in both Partners' Laboratories (University of Maribor and University of Minho).

Achievements

The reported working visit was once again very successful, as the above objectives were completely attained:

- Concerning research directions for this visit and for next year, three alternatives were proposed:
 - Use of *Aspect-Oriented Programming* (AOP) in Alma's implementation.
 - Use of a declarative environment (Prolog+DCG or Haskell+AGSystem) as a prototyping tool for our *Grammatical Approach to Problem Solving*.
 - Exploit *Grammar-Based Systems* (GBS) in order to find patterns of successful application and guidelines to those programmers that chose the grammatical approach to solve problems.

The outcomes were:

- Maria João gave a short tutorial on Alma system in order to emphasize the different visualization levels that we plan to develop. Then Tomaz talk about AOP.
We were convinced that this new paradigm could be used and could be helpful in the future re-implementation of Alma; Eva will take that in consideration when she starts her implementation work.

- Pedro talked for a while about Definite Clause Grammars (DCG) in *Prolog*, and the similar approach that Doaitse Swierstra is introducing with his Attribute-Grammar system in *Haskell*; Pedro explained, then, his idea about the usefulness of a declarative programming environment to develop language processor prototypes in the last phase of the *Grammatical Approach to Problem Solving* proposal.

This topic should not be the main research direction, however we agreed that it deserves some more attention in future meetings.

- Damijan and Tomaž explained what could be done to follow up the study they have started on GBS.

We have identified the need for some guidelines that could help a programmer in deciding if his problem is a good candidate to be successfully implement as a GBS; we forecast that we can provide such guidelines in the form of a decision tree built after extracting problem patterns from the of GBS analyzed.

Moreover, we also said that we would like to provide programming patterns to help the practitioners in applying our approach.

According to all the ideas discussed, we agreed in choosing *grammar-based systems* as the direction for future joint work; so we start writing a technical report (based on the written material we have produced in the past years) that was fully structured and whose abstract defines precisely the research aims and objectives.

- Concerning editing policy, we decided to use the *file version control system* CVS, that allows a multi-user/collaborative edition of source documents.

We will use the CVS-Server supported in U. Maribor by Tomaž. To help us using this approach, we have installed in our machines CVS-Web for Linux, and Win-CVS for Windows; Tomaž and Damijan gave us a short tutorial on those tools.

- We also decided to created a WWW-Site with 2 main purposes:
 - publish general project information (static component);
 - support a repository of information produced by the research activities (dynamic component).

To improve the management and maintenance of the dynamic component (point 2 above), making the task easy and attractive, we have

agreed in using a Wiki system. With the aid of Joost (who also gave a short tutorial), we created such site under the TWiki system of our department at U. Minho.

- Ongoing projects have been discussed:
 - Damijan gave a talk on "Grammar-based systems",
 - Tomaž Kosar described his work "Experiencing diverse Implementation Approaches for DSLs",
 - Gustavo Arnold presented his undergoing Ph.D. research on "Automatic Code Generation for Robot programming",
 - Paulo Oliveira presented his undergoing Ph.D. research on "Data Cleaning to prepare data in analysis environments",
 - Tiago presented his undergoing M.Sc. research on "Incremental approach to grammar design and testing",
 - Eva Oliveira presented her undergoing M.Sc. research on "Program Comprehension supported by Alma animation system"; she also showed us the Jelliot system, to animate Java programs.

At the end, we also said that U.Minho is still interested in the discussion of a joint proposal for an *European Master Program*.

Future Work

- 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

Next Meeting

- Portuguese team will visit Maribor University next month in order to continue this joint work.