Concurrent constraint programming for time-critical applications

Fact Sheet

Project Information

**COTIC**
Grant agreement ID: 23677

Funded under
FP4-ESPRIT 4

Overall budget
€ 180 000

EU contribution
€ 180 000

Coordinated by
Utrecht University
Netherlands

**Start date**
1 July 1997

**End date**
30 June 2000

Objective

The objective of this working group is to investigate time-critical applications within the paradigm of concurrent logic and constraint languages. More specifically, the group focuses on the design and development of a declarative logic language based on extensions of concurrent constraint programming. These extensions will consist of the introduction of real-time control structures and constraint domains for temporal reasoning. The design decisions will be driven by a set of specific applications. The group is also developing techniques for verification and analysis of programs, extending existing methodologies to logic languages.

Many applications such as, robotics, network management, or deductive temporal databases have time-critical aspects. Until now programming concepts related to time have been mainly developed in the context of imperative programming. In contrast a declarative programming style, since it reduces the gap between
specifications and programs, facilitates the development, maintenance and modification of such programs. Declarative programming is supported by both functional and logic languages. Logic languages also have the advantage that they allow simple concurrent extensions and they can naturally be integrated with constraint programming. Moreover, due to their explicit logical nature, they allow quite simple methodologies for program correctness. For these reasons, we believe that logic languages are natural candidates to deal with the difficulties of time-critical applications.

The overall approach is to develop and integrate programming concepts related to time with existing concurrent (constraint) logic languages. More specifically, the overall approach is structured along the following lines: (1) identification and classification of the kind of industrial time-critical applications most suited for a declarative programming style, (2) investigation of what are the most promising extensions of which existing constraint logic languages.

Co-ordination of research activities will include the organisation of a workshop of four days every nine months. Besides these workshops interactions will take place in the form of exchanges of personnel, i.e. visits of researchers from one site to another site. In order to identify industrially relevant applications and to maintain interaction with the synchronous community the working group will also interact with a steering committee of representatives of the synchronous community. Members of the steering committee will be invited to the workshops.

**Fields of science**

- natural sciences ➔ computer and information sciences ➔ databases
- engineering and technology ➔ electrical engineering, electronic engineering, information engineering ➔ electronic engineering ➔ robotics

**Programme(s)**

FP4-ESPRIT 4 - Specific research and technological development programme in the field of information technologies, 1994-1998

**Topic(s)**

- 4.0 - Long Term Research

**Call for proposal**
Funding Scheme

ACM - Preparatory, accompanying and support measures

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