

APPLAUSE: Applications Using the ElipSys Parallel CLP System

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1 Introduction

The APPLAUSE (Application and Assessment of Parallel Programming Using Logic) Project is building major applications using the ElipSys parallel constraint logic programming system developed at ECRC (European Computer-Industry Research Centre). APPLAUSE is a three year project which began in May 1992. It brings together end-users, applications developers and technology providers.

2 Manufacturing Planning: Dassault Aviation

Dassault Aviation is using ElipSys to enhance and extend the PLANE manufacturing planning system. PLANE is designed to assist the planning of long term (5 to 10 years) production schedules for a collection of assembly lines manufacturing a mix of different aircraft types. The aim of the system is to pace the assembly lines, under a given set of constraints, so as to minimize the combination of the stock costs and the production rate changes.

ElipSys is being used to explore disjunctive constraints, labelling strategies and search heuristics in parallel.

3 Tourist Advisory Systems: Expert Systems International & the University of Athens

MaTourA is a Multi-agent Tourist Advisor being built by Expert Systems International and the University of Athens as a demonstrator for the Greek National Tourist Organization. The system is designed to support the work carried out by travel agencies by providing an interactive and efficient way to construct personalized tours, select package tours and exploit the underlying tourist information.

MaTourA is comprised of a set of autonomous agents reflecting the procedures involved in a tourist advisory environment. The knowledge-based agents of MaTourA are being built using ElipSys.

4 Molecular Biology: Imperial Cancer Research Fund

The Imperial Cancer Research Fund is using ElipSys to address a number of challenging problems in protein structure analysis and molecular genetics.

The advantages arising from the use of ElipSys occur both as a result of the existence of a priori constraints (e.g. rules that govern protein folding and prior knowledge of local gene order) which can be used to prune the search tree and because the remaining, possibly massive, search spaces can be explored in parallel.

5 Environmental Monitoring and Control: Systems & Management

Systems & Management is developing a knowledge-based decision support system concerned with the monitoring and control of pollution in the Venice Lagoon as a demonstrator for the Venice Water Magistracy. It is aimed at assisting the authorities in two major aspects: the correct evaluation of the state of the pollution; and the planning of technical interventions aimed at restoring an acceptable state at acceptable costs.

ElipSys is being used to build an interpretive model of the analysis and decision-making activities. The constraints and parallelism of ElipSys are seen as complementary means to attack the combinatorial aspects of the evaluation and decision-making processes.

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