

The Task-Resource Architectural View

A Domain-Specific View for Controllers of Manufacturing Systems

Arie van Deursen
CWI and Delft University of Technology
The Netherlands
arie.van.deursen@cwi.nl

Bas Graaf
Delft University of Technology
The Netherlands
b.s.graaf@ewi.tudelft.nl

IPA-lentedagen

March 30 – April 31, 2005

Abstract

Control of manufacturing systems can be implemented by considering these systems as task-resource systems, in which machine actions, tasks, are executed by electromechanical subsystems, resources, to carry out different manufacturing requests. This presentation considers the architectural implications of following such an approach for the control software of complex manufacturing systems, such as, for example, a wafer scanner.

The scheduling of tasks and resource allocation to tasks can be done in a generic way using reusable scheduling functionality, leaving the choice of tasks, resources and their relations as the open design decisions for developing such a controller. We propose an architectural viewpoint that helps to understand the software of control systems in terms of these design decisions by explicitly showing tasks and resources. We define the viewpoint according to the templates proposed in the software architecture literature, explain the relationship with existing viewpoints such as the module-uses or pipe-and-filter views, and discuss a number of different applications of the new viewpoint, including conformance checking and support for migration to a generic task-resource approach.