Guest Editors' Introduction

Graphics for Robotics and CAD/CAM/CIM Planning

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In this special issue of CG&A we are addressing the use of computer graphics as a technique and as a tool for visualization, design, simulation, and planning of robotics and production systems. This issue is application-oriented and addresses the fundamental importance of computer graphics in the industrial environment. Computer graphics is not described as a technology by itself, but primarily as a means to support engineers in designing and users in operating industrial systems.

Raczkowsky and Mittenbuehler discuss robot simulation, including sensor data in the simulation process. They especially present techniques for the visualization of the sensor view of a scene (view of a camera).

Jerard et al. report on a technique designed to move the NC proof process from machining wooden or plastic models into software by means of graphics simulation of the machining process.

Mendelbaum and Finkelman discuss graphic design tools for the development of real-time systems. Their article describes a computer-graphics-based tool for developing the software needed for such a system.

Chen and Parent present a technique that can be used for predicting trends in form or for extracting stereotypes from a group of related shapes, as well as for creating new forms and generating new ideas.

Solid modelers for robot action planning is the topic addressed by Mirolo and Pagello, while Dai handles the subject of motion planning of robot manipulations in an
These articles use off-line programming system. These two articles use graphics modeling to implement methods for collision avoidance.

These six articles, do not, of course, address all possible technical issues and do not give a comprehensive report on all methods and techniques related to the overall topics of this special issue of CG&A. They do, however, give an important and representative cross view of ongoing work in this area and the manifold potentials of computer graphics as a tool for programming, design, and simulation, and as a technique for the visualization of processes in a dynamic industrial environment, especially related to production.

We want to thank all the authors for their contributions, all reviewers for their support in the reviewing process, the publisher for making all efforts to print this issue, and the Editor-in-Chief of CG&A, John Staudhammer, for his encouragement and motivating support during the process of putting together "Graphics for Robotics and CAD/CAM/CIM Planning."

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January 1989