

BOOK REVIEW

Computer-Aided Design: Advances in Research and Applications

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Computer Aided Design - Advances in Research and Applications presents concepts, technologies and methods used in computer aided design. The paper is structured in 8 chapters, each of which is written by specialists in the domain and is dedicated to one of the aspects related to the use of computer systems in the design and inspection of industrial products.

The first chapter, authored by Professors Dimitris Nathanael and Loizos Psarakis, deals with the use of virtual reality in workstation design based on human-robot collaboration. It examines the issues involved in designing and implementing shared workspaces where humans and robots work together to achieve common goals. The challenges posed by such applications and the conditions imposed are presented. The devices used are presented and models for simulating workstations are proposed. Towards the end of the chapter, suggestions are made on the principles that should underlie the design of human-robot collaborative workstations.

The second chapter is written by a team of researchers consisting of Demetric Galanakis, Danae Phaedra Pocobelli, Antonios Konstantaras, Katerina Mania and Emmanuel Maravelakis. This chapter deals with the methodology of computer modelling of buildings with application in cultural heritage conservation. It presents the steps involved in modelling a building, starting with data acquisition, and ending with the manipulation of metadata and obtaining the "smart object".

The third chapter is reserved for a case study on modelling and analysing a plastics injection moulding process. The chapter is written by recognised specialists in the domain, namely Thomas Kestis, Anastasios Tzotzis, Dimitrios Tzetzis and, last but not least, Panagiotis Kyratsis. The case study presented underlines that the simulation of the injection moulding process is a crucial step in verifying the correctness of the technology for making plastic parts. For simulation purposes, a part with a design flaw was chosen and it is shown that this flaw leads to manufacturing defects. Next, the parameters of the injection moulding process are analysed and the most important of these parameters are identified and selected for analysis. At the end of the chapter, issues related to parameter optimisation and possibilities to improve the manufacturing process are presented.

Chapter four, authored by Apostolos Tsagaris, Vasilis Samaras, Athanasios Manavis and Panagiotis Kyratsis, addresses the issue of designing a human-robot interaction system. Aspects related to offline programming of the operation of a five degrees of freedom robotic arm are studied. In addition to the advantages of offline programming, the chapter also highlights the possibility of integrating analysis, data processing, simulation, trajectory programming, etc. applications from different manufacturers into the program.

In chapter five, modelling and simulation of unconventional manufacturing processes is presented. The chapter is written by a team of specialists from the Polytechnic University of Bucharest, composed of Daniel Ghiculescu, Bogdan Cristea, Gabriela Parvu, Cristina Iuga and Mihaela Cirstina. Aspects related to modelling and simulation of electroerosion machining are presented. At the end

of the chapter, aspects related to the modelling and simulation of circuits used in microfluidics are presented.

The sixth chapter is written by Nikolaos Tapoglou, Anastasios Tzotzis, Panagiotis Kyratsis and Chara Efstathiou. The chapter contains issues related to the topographic evaluation of the flanks of a gear. The subject of this chapter is a platform for the analysis and visualization of topological data related to the flanks of an evolving gear. This platform has been tested using data collected from flanks of gears made by various processes.

Chapter seven presents some of the main computer-aided printing technologies. The chapter is written by specialists from the University of Novi Sad: Nemanja Kasikovic, Sasa Petrovic, Gojko Vlastic, Gordana Bosnjakovic and Zeljko Zeljkovic. The chapter compares CAD plotters based on various criteria and highlights the advantages and disadvantages of each type of plotter.

The work concludes with chapter eight, written by Ioannis Pimenidis, Christos Koidis, Panagiotis Kyratsis and Dimitrios Tzetzis. The chapter is devoted to the design and vibromechanical analysis of a stringed instrument, more specifically, a lyre. The chapter starts with the presentation of some general aspects related to this musical instrument, continues with the dimensional analysis and the presentation of some considerations related to the materials from which the body of the lyre can be constructed and, finally, a vibromechanical analysis of the proposed design is carried out.

The work is written in a rigorous language that is scientifically correct and, at the same time, accessible to those to whom it is addressed. The work has a pronounced scientific character and is of real use not only to engineers but also to all those interested in computer-aided design.

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