

Design of Micro Opto-Mechatronics System

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ABSTRACT

The basic assumption for the design of mechatronic devices is the acquisition by the device itself which is responsible for the lower levels of the process (task) to allow the user to focus on higher-order functions. Mechatronic device structure can be considered at two levels: abstract, consisting of the conjunction of partial functions of the main function device and the specific plane, consisting of the combined structural parts and assemblies, which are natural carriers of various functions involved. The integration of mechatronic device structure is a result of links among 'smart' teams which communicate and cooperate. The linking mechanical structure, sensors, actuators and information processing occur as a result of mass flow of streams, of energy and information.

INTRODUCTION

The term mechatronics was introduced to the technical terminology by the Japanese company Yaskawa Elektric Corporation (a company founded in 1915) and since 1971 it has been protected as a trade name. Mechatronics in the initial period was understood as the design and construction activities involving the inclusion of electronic components and systems to the functional structure of various precision mechanisms. In 1982, Yaskawa Elektric Co.. resigned from the patent protection of its trademark and from now on we can all use this term. Today it means mechatronics engineering

activities including designing, testing and operation of machinery and equipment, in which there is a high level of functional integration of mechanical systems with electronics and computer control. Mechatronics is an interdisciplinary field, combining in a synergistic manner the classical knowledge of mechanical engineering, hydraulics, pneumatics, electronics, optics and computer science. The aim of mechatronics is to improve the functionality of technical systems and the creation of new concepts of machinery and equipment with built-in 'artificial intelligence'.

Mechatronics :

definitions of mechatronics can be found, almost all of them put the emphasis on the functional integration of mechanical actuators with electronics and computer control.

Mechatronics is not a subject, science or technology per se - it is instead to be regarded as a philosophy - a fundamental way of looking at and doing things, and by its very nature requires a unified approach to its delivery. The traditional western approach has relied on single discipline identities and evolutionary solutions based on bolt-on technology. On the other hand, Mechatronics solutions require the use of integrated teams of personnel working towards a common goal. Thus the Mechatronics engineer identifies with systems thinking, and a philosophy that lies behind it all. A Mechatronics 'product' derived through systematic, rather than piecemeal processing. It, therefore, seeks to optimize an 'engineered' solution rather than compromise it. Mechatronics philosophy adequately describes the process by which it is achieved. This insight quite naturally lends itself to the concept of 'total quality', something that western industrialized nations have only in the last decade or so come to aspire to. But for Mechatronics, quality is already implied by the way in which system based solutions are to be sought, and the methodologies used for achieving it. It is hoped that industry and commerce will similarly come to respect and aspire to Mechatronics for what it stands for - total synergy.

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