

STUDY REGARDING INDUSTRIAL ROBOTS DIGITAL TWIN DESIGN IN CAD-CAM SOFTWARE

Ana-Maria ȘTEFAN¹, Dorel ANANIA²

Rezumat. *Noile tehnologii de digitalizarea a entităților economice specifice conceptului de industrie 4.0 nu pot fi transpuse în practică fără utilizarea echipamentelor comandate numeric. Roboții Industriali (RI) reprezintă echipamentele prin acțiunea programată în mediul virtual este realizată în mediul real. În acest caz, acuratețea modelului virtual al unui sistem de producție este esențială. Practic, trebuie recreat „geamănul digital” al fiecărui echipament real, implicit a RI. Lucrarea de față își propune să prezinte metodologia de implementare a RI în medii CAD-CAM și utilizarea în aplicații de modelare a sistemelor de producție. O implementare corectă a unui robot industrial într-un mediu virtual CAD-CAM implică modelarea atât a arhitecturii RI, a cinematicii acestuia, dar și a echipamentului de comandă.*

Abstract. *New technologies, for digitizing economic entities, specific to the concept of Industry 4.0 cannot be put into practice without the use of numerically controlled equipment. Industrial Robots (IR) represent the equipment through the action programmed in the virtual environment is transferred in the real environment. In this case, the accuracy of the virtual model of a production system is essential. Practically, the "digital twin" of each real equipment, implicitly of RI, must be recreated. This paper aims to present the methodology for implementing IR in a CAD-CAM environments and its use in production system modeling applications. A digital twin IR definition consist in a correct modeling of robot features like architecture, controller, and kinematics.*

Keywords: CAD-CAM, Industrial Robots, Digital Twin, Kinematics

1. Introduction

The current industrial systems can no longer perform in a dynamic market without an intensive digitization of each phase of production, administration, management, and marketing. Practically today we are talking about the evolution of production systems both from a real point and a virtual point of view. The real systems develop their digital twin in the same time with the transformations imposed by necessity of communication between the two environments: real-virtual.

A current industrial system must be able to download information from a CAD-CAM software (which defines the virtual environment) but also to upload data from the real environment to virtual environment [1].

¹Eng., Faculty of Industrial Engineering and Robotics, University POLITEHNICA of Bucharest, E-mail: anastefan44@yahoo.com.

²Associate Professor, Faculty of Industrial Engineering and Robotics, University POLITEHNICA of Bucharest, E-mail: dorel.anania@upb.ro
