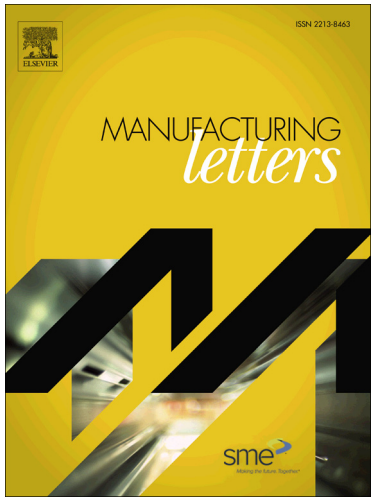

Letters

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Lessons from social network analysis to Industry 4.0

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Abstract

With the advent of Industry 4.0, a growing number of sensors within modern production lines generate high volumes of data. This data can be used to optimize the manufacturing industry in terms of complex network topology metrics commonly used in the analysis of social and communication networks. In this work, several such metrics are presented along with their appropriate interpretation in the field of manufacturing. Furthermore, the assumptions under which such metrics are defined are assessed in order to determine their suitability. Finally, their potential application to identify performance limiting resources, allocate maintenance resources and guarantee quality assurance are discussed.

Keywords: complex networks, smart manufacturing, Industry 4.0

2017 MSC: 00-01, 99-00

1. Introduction

Manufacturing systems have evolved from in-series production lines comprised of ordered, sequential, task-specific workstations, towards manufacturing networks made of flexible value-adding units capable of adapting to multiple tasks distinctive of Industry 4.0 [1]. In addition, the automation of repetitive tasks undertaken during the third industrial revolution has been coupled with ubiquitous cyber-physical systems with an ever growing number of embedded sensors that continuously generate high volumes of data [2]. This data is used

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