

International Journal of Production Research >

Volume 49, 2011 - [Issue 5: Multi-agent and holonic techniques for manufacturing systems: technologies and applications](#)

770 Views | 39 CrossRef citations to date | 0 Altmetric

Original Articles

Multi-agent based scheduling in manufacturing cells in a dynamic environment

Paolo Renna 

Pages 1285-1301 | Accepted 01 Aug 2010, Published online: 15 Dec 2010

 Cite this article  <https://doi.org/10.1080/00207543.2010.518736>

Sample our
Engineering & Technology
Journals
>> **Sign in here** to start your access
to the latest two volumes for 14 days



 Full Article  Figures & data  References  Citations  Metrics

 Reprints & Permissions

Read this article

 Share

Abstract

Manufacturing systems need to develop more strongly time-oriented strategies in order to react to the dynamic conditions of the competitive environment. This research concerns the scheduling of cellular manufacturing systems by multi-agent architecture in real time. This research proposes a coordination approach for the multi-agent architecture based on the computation of internal and external indexes of the generic manufacturing cell. The proposed approach has been compared with an approach based on the workload index in order to provide evidence of the improvements. A simulation environment developed in the ARENA® package was used to implement the approaches and evaluate the performance measures. The performance measures investigated are: throughput time, throughput, work in process, machines average utilisation, and tardiness. Several scenarios are considered: from static to very dynamic

conditions for internal and external exceptions of the manufacturing system. The simulation results highlight that the performance of the proposed approach outperforms the performance of the benchmark in all conditions.

Keywords:

multi-agent systems

scheduling

negotiation

dynamic environment

simulation

Related Research Data

[Internet Scheduling Environment With Market-Driven Agents](#)

Source: IEEE Transactions on Systems Man and Cybernetics - Part A Systems and Humans

[Agent-Based Systems for Manufacturing](#)

Source: CIRP Annals

[A hybrid scheduling and control system architecture for warehouse management](#)

Source: IEEE Transactions on Robotics and Automation

[Development of the order fulfillment process in the foundry fab by applying distributed multi-agents on a generic message-passing platform](#)

Source: IEEE/ASME Transactions on Mechatronics

[Dynamic shopfloor scheduling in multi-agent manufacturing systems](#)

Source: Expert Systems with Applications

[A distributed architecture and negotiation protocol for scheduling in manufacturing systems](#)

Source: Computers in Industry

Related research

People also read

Recommended articles

Cited by
39

Information for

[Authors](#)

[R&D professionals](#)

[Editors](#)

[Librarians](#)

[Societies](#)

Opportunities

[Reprints and e-prints](#)

[Advertising solutions](#)

[Accelerated publication](#)

[Corporate access solutions](#)

Open access

[Overview](#)

[Open journals](#)

[Open Select](#)

[Dove Medical Press](#)

[F1000Research](#)

Help and information

[Help and contact](#)

[Newsroom](#)

[All journals](#)

[Books](#)

Keep up to date

Register to receive personalised research and resources by email



Sign me up



Copyright © 2026 Informa UK Limited [Privacy policy](#)

[Cookies](#) [Terms & conditions](#) [Accessibility](#)

Registered in England & Wales No. 01072954
5 Howick Place | London | SW1P 1WG



Taylor & Francis
by informa