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A multi-purpose simulation approach for digital factory environments based on Java EE

Hemmer, H., Silber, M., Kühn, W.
Department of Electrical, Information and Media Engineering, University of Wuppertal, Wuppertal, Germany

Abstract

This paper proposes a simulation approach that can be used both in a discrete event simulation mode and in a proportional-time mode. It is targeted to fit the needs of Digital Factory environments, where simulation of production resources along with statistical failure distributions are essential. The implementation of the proposed approach focuses on realizing these features in a clear manner regarding not only the modules usage and integration features, but also the code design. It uses Java Enterprise Edition (Java EE) technology to keep the business logic of the simulation core as small as possible. The simulation core has been developed as a part of the OpenFred framework - an Open Source Digital Factory for Research and Education Demands. Simulation is used for different tasks in this context, provides real time data for virtual reality representation of the factory floor, acts as an evaluation tool for production planning methods and is used to support accounting decisions.

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Hemmer, H.; Department of Electrical, Information and Media Engineering, University of Wuppertal, Wuppertal, Germany; email: hhemmer@uni-wuppertal.de
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