

Selected applications of manufacturing system design, *ijcim* vol 28-1 (2015)

D.Mourtzis, N. Papakostas, D. Mavrikios, S. Makis, K. Alexopoulos, *The role of simulation in digital manufacturing: applications and outlook*.

The authors investigate simulation-based applications in different manufacturing domains (product and production process design as well as resource planning). Research trends are discussed (computing services including cloud and internet of things).

Intern. Journal of CIM, Vol. 28, Nr. 1, pp 3-24

Contact: mourtzis@lms.mech.upatras.gr

X. Yang, R.C. Malak, C. Lauer, C. Weidig, H. Hagen, B. Hamann, J.C. Aurich, O. *Manufacturing systems design with virtual factory tools*.

The paper presents Virtual Reality as a design platform for manufacturing systems that enables a holistic use of virtual factory tools with the focus is on simulation and visualisation. The concept is demonstrated on three applications focussing on different levels of the manufacturing systems.

Intern. Journal of CIM, Vol. 28, Nr. 1, pp 25-40

Contact: weidig@cpk.uni-kl.de

K. Vergidas, C. Turner, A. Alechnovic, A. Tiwari, *An automated optimisation framework for the development of re-configurable business processes: A web services approach*.

Based on the bpo-Framework described in Vergidis* the authors extend the framework by introducing web services to facilitate process interactions. Three case studies demonstrate the improvements of the BP design. Directions of future research are proposed.

* Vergides et al. 2007. *Optimisation of BP designs: An algorithmic approach with multiple objectives*. *Intern. Journ of Production Economics* 109: 105-121

Intern. Journal of CIM, Vol. 28, Nr. 1, pp 41-58

Contact: c.j.turner@cranfield.ac.uk

T. Masod, R. Roy, A. Harrison, y. Xu, S. Gregson, C. Reeve, *Integrating through-life engineering service knowledge with product design and manufacture*.

A causal model is used to represent cause and effects of through-life engineering service knowledge (SK) and a digital framework addresses the integration challenges in digital feedback. The framework has been validated by industry experts. Further framework enhancements will come from future case studies The intentions are to use the framework in the development of a SK backbone demonstrator application.

Intern. Journal of CIM, Vol. 28, Nr. 1, pp 59-74

Contact: tm487@cam.ac.uk

W. Dai, P.G. Maropolulos, Y Zhao, *Reliability modelling and verification of manufacturing processes based on process knowledge management*.

The paper presents an integration framework of process reliability and product quality together with a product development and a reliability verification process. Process knowledge is represented by key characteristics (KC's) organised into 4 clusters: product, material, operation and equipment. Using a mathematical model and algorithm the KC reliability requirements are calculated for different process scenarios. A case study verifies the applicability of the verification procedure.

Intern. Journal of CIM, Vol. 28, Nr. 1, pp 98-111

Contact: dw@buaa.edu.cn