

A special session will be organized on "evolvable production systems" on the 37th annual conference on the IEEE Industrial Electronics Society, November 7-10, 2011, Melbourne, Victoria, Australia.

Sustainability, defined as one of the main goals at the Lisbon and Gothenburg Councils, remains elusive in production systems. Sustainability is a scenario in which companies need to re-engineer rather than re-develop their existing production systems, within the shortest possible time, and at a minimal economic and ecological impact.

Evolvable Production Systems (EPS) is a viable paradigm to attain such goals, and is radically new: it does not focus on solutions which try to accomplish all of the envisaged production needs within a closed unit but, rather, a solution which, being based on several re-configurable, process-oriented, low granularity intelligent modules, allows for a continuous evolution of the production system. EPS also goes a step further by proposing a totally new way a considering the products and production systems: the design cycle of the products will be influenced by which modules are available.

EPS, with its distributed, multi-agent control approach and dynamic link between product design and production system development, may be considered as entering the realm of Complex Systems. In effect, the small-scale cooperating units with self-configuration, selfdiagnostics, and self-organisation will exhibit behaviours that cannot be forecasted or planned for: emergent behaviour. The main research focus is, therefore, to develop an open system architecture for an

evolvable production system, with the necessary tools and methods for analysis of emergent behaviour and subsequent complex system development methodology.