

Project PN-II-ID-PCE-2007-1

Development of a new concept for manufacturing machine control-holarhic attributive control

- Abstract -

Manufacturing machine control implies the following aspects: geometry control, dimensional control, stability control, cost control, adaptability and predictability assurance, optimal adaptive and predictive features of the control system, as well as models structuring and building.

The project subject is the manufacturing machines dedicated to workpiece processing. Project goal is the increasing of manufacturing machine competitiveness through : i) lead time reducing; ii) fast programming; iii) deviation minimizing iv) productivity increasing; v) cost minimization and, finally, vi) stability control.

This project is based on the following four key ideas: a) attributive modeling instead of phenomenon approach aiming the integrated control of the physical, economic, commercial, trading, and organizational aspects of the manufacturing machine operation; b) holarhic control system with an open architecture instead of hierarchical control with closed architecture; c) knowledge acquisition from current operation and its immediate using for manufacturing machine control; d) control based on simple localized models builded with recent data instead of complex and general model builded with historical data. Project aims the development of a new concept for manufacturing machine control based on holarhic attributive modeling and online unsupervised learning, and development of a proof-of-concept experimental demonstrator.