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Are we talking the same language on the future of manufacturing?

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For the first time in a long time, in smart manufacturing or Industry 4.0, industry finally has something that has grabbed the media's attention. The number of trends and topics incorporated is vast, as is the range of stakeholders. With this comes the question: Are we talking the same language on the future of manufacturing? With the growing number of terms, associations and standards aimed at promoting smart manufacturing, the focus, support and direction of each can vary. This presentation will review three key regions, the similarities and differences between how each is approaching the transition to smart manufacturing, and the driving forces (and inhibitors) behind the initiative. An overview of the latest IHS research on smart manufacturing (including the cloud, IoT in industrial automation and the industrial app/mobility) will also be discussed.

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Industrial automation facing the parallel shift challenge

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The presentation points a new technological boom, following the 2008 global finan¬cial crisis, triggered by the development and dissemina¬tion of the FPGA technology in electronics and IT. Some outstanding achieve¬ments in avionics, biomedical/health care equipment and data flow com-puting are briefly analyzed, revealing a lush superiority of the FPGA systems comparing to the conventional bus oriented computing devices: microprocrcontrollers, DSP, etc. in most respects: speed, energy con¬sump¬tion, size, weight, reliability, etc. The industrial automation must take this wave, sooner the better. The FPGA revolution is due to the FPGA parallel programmed architecture. How-ever, the parallel shift comes with a price: the conception and the programming of the all parallel operating devices/embedded systems are totally different from the conventional ones, demanding new skills and dedi¬cated train¬ing. Most of the existing FPGA applica¬tions are just emulating conventional programmed oper¬a¬tion and lose such way almost all the potential advantages of the parallel computing. One of the adequate theoretical tools, the fuzzy interpolative methodology, able to bring the linguis¬tic representation of knowledge into the embedded systems' camp is exposed. This ap¬proach is able to implement fuzzy expert systems by means of look-up-tables with linear interpola¬tion, and it also can incorporate specific knowledge about the applications by means of internal models. Such sys¬tems are using a classical time analysis by phase trajectories. Some applications are eventually provided: the constant time to collision opti¬mization of the traffic, the imposed dis¬tance brak¬ing, the bronze casting with controlled cooling rate, etc.

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