The Entanglement of Control and IT in 21st Century: Intelligent Systems

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The presentation discusses the entanglement of control and information and communication technologies (ICT) in the 21st Century as the basis of intelligent systems. An assessment of the past is presented, discussing the profound technological changes that have taken place during the last 2 decades, especially the changes observed in manufacturing industries. The emerging paradigms of big data and cyber physical systems (CPS), supported by new disruptive advances both on software and hardware side, as well as the cross-fertilization of concepts and the amalgamation of information, communication and control technology driven approaches are pointed out to. The role of deep learning in big data and CPS is discussed. This is followed by a look at the evolution of the manufacturing paradigms, with particular emphasis on the Fourth Industrial Revolution, one of the aims of which is to introduce higher levels of machine IQ in devices. The talk closes with a consideration of the possible research directions in mechatronics and robotics as the driving forces behind intelligent systems.