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A new approach in virtual sensing

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According to the National Research Council, the use of Embedded Systems throughout society could well dominate previous milestones in the information revolution. Mechatronics is the synergistic combination of precision mechanical engineering, electronic controls and systems engineering in the design of products and processes. Mechatronic systems are putting intelligence into physical systems. Embedded sensors/actuators/processors are integral parts of mechatronic systems. On the one hand, implementation of the mechatronic systems is on the continuous rise. On the other hand, manufacturers are working hard to reduce the implementation cost of these systems. One way of reducing this cost is the use of virtual sensors in place of the actual sensors. In this presentation, the advancement of mechatronics in the automotive domain will be discussed. The emphasis will on be utilizing virtual sensors for feedback control design. A new mathematical (estimation) technique based on the Youla parameterization utilizing Controlled Output Observer framework, for developing virtual sensors, will be introduced. Several practical examples about the effectiveness of this methodology will be presented.

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