

Automatic Control

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Order of Embedded System

Below a demonstration of the Embedded System process is ordered.

The embedded system consists of an inverted pendulum with an inertia wheel. A digital signal processor (DSP) is integrated with the pendulum and it should implement the control law in real time. The controller should swing up the pendulum and stabilize it in the upright position.

The system should be implemented by using a professional DSP programming environment and it should illustrate how the control performance is affected by the sampling time.

The control system has to provide also safety features such as detecting of unsafe conditions (e.g. a too high pendulum velocity) and corresponding action in order to bring the system in a safe condition (e.g. the pendulum should be controlled to the down position).

Cost/benefit analysis has to be considered throughout the whole project. So an advanced control technique more complex and expensive has to be well motivated with respect to a standard or classic control that is cheaper and less complex to implement. Moreover it is expected to get some comments on the system limitations and some suggestions for the improvement of performances (more transducers or actuators, etc.)

The delivery should consist partly of a short oral presentation and a demonstration of the control system features and partly of a written report, a poster, a web page and a CD. The poster should summarize the results of the project while the web page should describe the project goal and document the whole progress of the project. The developed software should be packaged on a CD together with all other deliveries (web pages, documents, etc.). The software should be auto-installing like standard Windows programs and it should be clearly specified which other software is needed and how to start the demonstration.

Good luck,

Luigi Iannelli