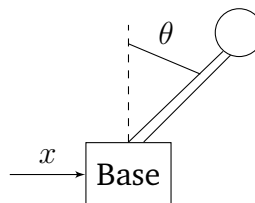


Prethesis:

Inverted Pendulum with imparted sensor information

Description:

The Inverted Pendulum is a classic example of feedback-driven control of an inherently unstable open-loop system. The objective of the inverted pendulum is to keep the top end in vertical position ($\theta(t) = 0$) by continuous compensation movements of the pendulum base ($x(t)$).



Several approaches to the Inverted Pendulum problems are known and well documented. Of interest for this project proposal is the question how such systems can be kept sufficiently robust in presence of partial or outdated sensor knowledge.

The practical relevance of such challenges is to be seen in the design and analysis of cyber-physical systems where control over shared communication networks is affected by congestion and delays. The implementation and simulation of the Inverted Pendulum shall be done in MATLAB. Simulations shall include varying delays and the system response in terms of variations of the control loop.

Chair: Prof. Dr.-Ing. Volker Kühn

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