



Synchronization under Control



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Synchronization is an old topic with important modern applications. More than three centuries ago, Christiaan Huygens was probably the first to give a scientific description of the (phase-) synchronization of two identical pendulum clocks that are attached to the same bar. In the last 10-15 years synchronization of complex and chaotic systems has become popular in different areas like dynamical systems, circuits and communications, and electrical and mechanical engineering. Typical (prospective) applications include (secure) communication, robot coordination, synchronization of oscillatory and rotating systems and many others, see for instance the review paper [1], that also includes further developments in the study of synchronization.

The purpose of this talk is to give a control perspective on the notion of synchronization. Also, the possibility to achieve synchronization by applying suitable feedback controllers will be discussed. In the talk, the main emphasis will be on illustrative examples rather than a complete theoretical foundation. Details can be found in [2].

References:

- [1] I.I.Blekhman, P.S.Landa, M.G.Rosenblum, 'Synchronization and chaotization in interacting dynamical systems', Applied Mech. Rev., vol.48, no. 11, part 1, pp.733-752, 1995.
- [2] H.Nijmeijer, 'A dynamical control view on synchronization', 3rd European Nonlinear Oscillations Conference, Copenhagen, 1999.