

Good to be late, precisely

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Abstract

Delays are a nuisance in control. But, are delays all that bad?

Following an idea of Pyragas, we attempt noninvasive and model-independent stabilization of unstable p -periodic phenomena $u(t)$ by a friendly delay τ . Our feedbacks are based on delayed differences like $u(t - \vartheta - \tau) - u(t - \vartheta)$. When the time delay τ is chosen to be an integer multiple np of the minimal period p , the difference and the feedback vanish: the control strategy becomes noninvasive on the target periodic orbit.

We pursue this idea for several examples, including simultaneous stabilization and destabilization of large amplitude rapid oscillations of Duffing type, and control of a delay equation by additional delays. Results include joint work with Alejandro Lopez, Sergio Oliva, Richard Rand, Simohamed Sah, Eckehard Schöll, Isabelle Schneider, and others. See also

<http://dynamics.mi.fu-berlin.de/>