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*"La mente è come un paracadute.
Funziona solo se si apre"
A. Einstein*

Novel Perspectives on Stability of Time-Delayed Systems (TDS) and Practical Implications

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Abstract

TDS are infinite dimensional systems. As such, they offer a mathematically very challenging stability and control problems, which kept many system specialists occupied in the past 6+ decades. In the seminar presentations we intend to cover UCONN's very recent and powerful umbrella paradigm called the "Cluster Treatment of Characteristic Roots (CTCR)". This paradigm brings a unique resolution to the stability problems of TDS via a substantially different perspective than the competing methodologies. It results in a paradoxical finding that indicates the stability of systems may be improved by artificially increasing the existing delays. This leads to a new stabilizing control concept which the PI named "the delay scheduling". CTCR was introduced and developed over the past 10 years at ALARM Lab of UCONN, by Prof. Olgac's research group.

End product of this treatment has direct practical implications.

- a) Delayed Resonator & actively tuned vibration absorber,
- b) Real time control using Delay Scheduling concept,
- c) Optimized metal machining free from machine tool chatter,
- d) New techniques in controlling multi-agent swarms under delayed communication exchanges.