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# Zero-Pole Assignment for Time Delay Systems Control with Uncertainties Considered

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***Abstract:***

Controlled systems are inherently affected by uncertainties due to nonlinearities, physical parameters' fluctuation, ambient conditions, etc. In addition, their models suffer from inaccuracies and undergo the necessary simplification of physical reality. These factors have to be taken into account when designing controllers in practice. Time delay systems include latencies in their inner feedback loops. They belong to the class of infinite-dimensional systems. This feature yields multiple obstacles when analyzing and controlling the system dynamics, mainly due to infinitely many response modes and non-minimum phase behavior.

Based on the facts above, robust control design of time delay systems still represents a challenging task in control engineering. This research question can either be solved via standard and well-established tools (such as a sensitivity function, robust performance and robust stability, stability margins, etc.) or by applying some advanced principles (pseudospectrum, smoothed spectral abscissa, etc.) or by combining both families of approaches. Hence, the student is to adopt, compare and enhance these approaches. The spectral properties of the control system should be emphasized. Besides, a method including not only poles but also feedback system zeros, proposed by the supervisor recently, should be applied, worked on, and further analyzed.

***Literature:***

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