

## ***Towards More Effective Representation of Time-Delay Systems***

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### ***Abstract***

For large systems, the traditional formulation of representing time-delay systems using functional-differential equations of retarded or neutral type is often not effective from the point of view of the natural structure of system and computational efficiency. A special form of coupled differential-functional or differential-difference equations is shown to be both general and computationally efficient. The process of representing practical systems in the standard form is illustrated. A number of standard problems such as stability, passivity, and input-output sensitivity are discussed.

### ***Biography***

Keqin Gu is a Professor and the Chair of Department of Mechanical and Industrial Engineering, Southern Illinois University Edwardsville. He received B.S. and M.S. from Zhejiang University, and Ph.D. from Georgia Institute of Technology. His research interest includes control systems and nonlinear dynamical systems, with special emphasis on time-delay systems. He is the lead author (with V. L. Kharitonov and J. Chen) of the book "Stability of Time-Delay Systems". He was the US Coordinator of three US-France cooperative research projects. He is currently an Associate Editor of Automatica and an Editorial Board Member of Journal of Franklin Institute. He was as an Associate Editor of IEEE Transactions on Automatic Control (2000-2002) and Guest Editor of Special Issue on Time-Delay Systems in Asian Journal of Control (2005). He was the Program Editor for the 3<sup>rd</sup> IFAC Workshop on Time-Delay Systems (2001) and Co-organizer of CNRS-NSF Workshop: Advances in Time-Delay Systems (2003). He served as a member of (International) Program Committee for a number of international conferences and workshops in control systems and time-delay systems. He served as a referee for a number of funding agencies around the world including US, UK, Israel, Georgia and Qatar.