

Methods for Predicting Stability of Non-Linear Systems

One aspect of this invention provides new methods for ascertaining the asymptotic stability of linear and non-linear autonomous systems. Another aspect of the invention provides methods for designing and implementing stable controllers for various systems.

The Problem

Much of the understanding of systems and our ability to control various systems is based on modelling. Typically, such system modelling is based on linear equations. Although actual systems frequently exhibit non-linear characteristics, they are often modelled using linear equations, leading to undesirable and inaccurate predictions of system behaviour. The current invention provides a novel method for modelling:

- System stability using non-linear autonomous systems;

The Alternatives

- Current methods for assessing system stability usually involve using the Lyapunov technique, which has many drawbacks;
- State space models rely on linear systems, which have only one isolated point of equilibrium.

Applications

- Mechanical, hydraulic, electrical and other engineered systems
- Scalar systems
- Van der Pol equation in reverse time
- Non-linear autonomous systems
- Quadratic models
- Equilibrium mapping

Intellectual Property Status

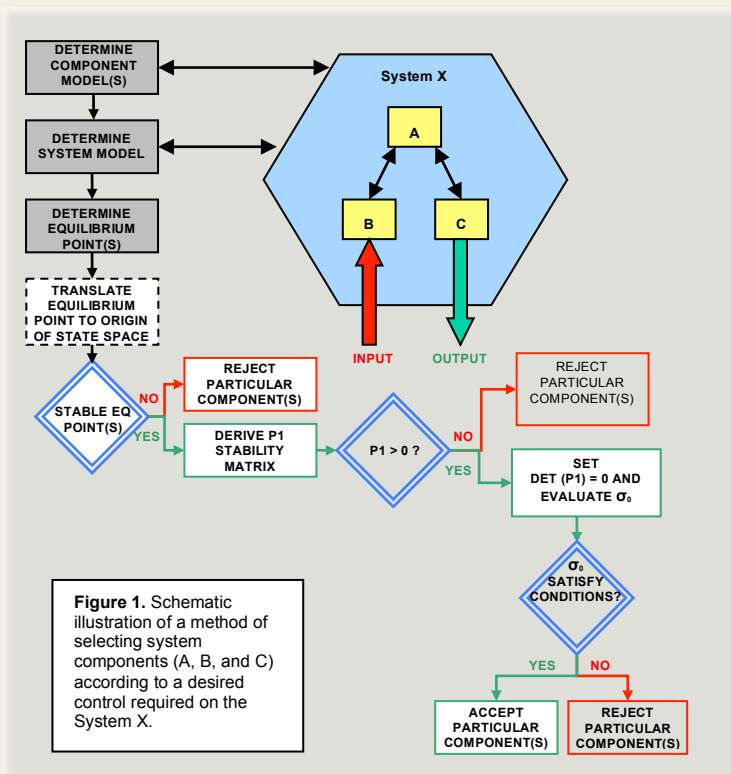
US Provisional Patent No. 60/8883953
filed January 8, 2007 by SFU
(Christensen et al.)

Stage of Development

- Proof of concept demonstrated
- Exploring other applications

Business Opportunity

Available for further development and licensing to established or start-up companies



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