Analysis of a Continuous Lur'e System with Sector-bounded, Slope-restricted Nonlinearities

TECHNISCHE UNIVERSITÄT DARMSTADT

Proposal for a Bachelor's Thesis Project

A Lur'e system, which consists of a linear time-invariant part in feedback with sector-bounded, slope-restricted memoryless nonlinearities, is very common in a wide range of engineering disciplines.

The aim of this project is to analyze this type of system in terms of stability, convergence rate, and gain analysis by using the Linear Matrix Inequalities (LMIs).

The project is theoretical and done in simulation only. The computation and simulation is done in Matlab. The student should have strong knowledge on Control Theory and Linear Algebra. The knowledge of LMIs is not a must, since the supervisor can provide quick overview and tutorials.

Benefit: After finishing this project, the student can have a strong background on Nonlinear Control and Lyapunov stability, which is necessary for advanced Control Theory-related courses in Master's level.

The language for discussion and writing is preferably English.

For more information, feel free to contact me via email.
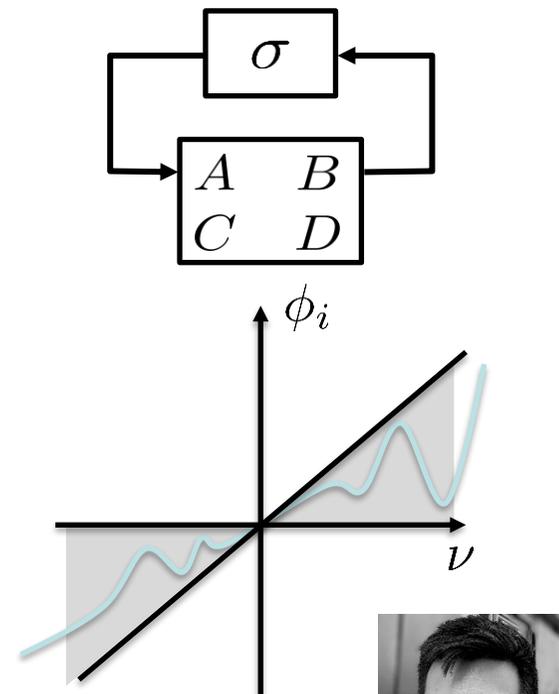
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