Contribution ID: **11** Type: **Poster**

Multi-point algorithm for eliminating hyper-chaotic vibrations in nonlinear dynamical systems

Friday 13 September 2024 10:00 (20 minutes)

Abstract –The paper presents an effective algorithm for stabilizing periodic orbits immersed in a strange attractor of phase trajectories, which involves small changes in selected parameters of the hyper-chaotic system at each sampling time. The applied control concept consists in modifying selected system parameters in such a way as to minimize the distance of the trajectory from a fixed point on the cross-section of the generalized Poincaré map. Using of multiple control parameters allows for the effective elimination of hyper-chaotic vibrations in complex nonlinear systems in the presence of strong disturbances and noise. The main attention has been focused on a non-autonomous hyper-chaotic system, which can be treated as representative of many advanced non-linear phenomena occurring in the real world. A characteristic property of the considered dynamical systems is the presence of at least two positive Lyapunov exponents. Such systems show very strong sensitivity to initial conditions and generate extremely complex strange attractors. The results of representative computer simulations have been analyzed and interpreted in detail.

Author: BASINSKI, Radoslaw (Institute of Theory of Electrical Engineering, Measurement and Information Systems, Warsaw University of Technology)

Co-author: SIWEK, Krzysztof

Presenter: BASINSKI, Radoslaw (Institute of Theory of Electrical Engineering, Measurement and Information Systems, Warsaw University of Technology)

Session Classification: Session 6 - Poster Session B