

## Self-Organizing Control Systems for Unstable and Deterministic Chaotic Processes

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**Abstract :** The paper proposes a method for constructing a self-organizing control system for unstable and deterministic chaotic processes in the class of catastrophe “hyperbolic umbilic” for objects with m-inputs and n-outputs. The self-organizing control system is investigated by the universal gradient-velocity method of Lyapunov vector functions. The conditions for self-organization of the control system in the class of catastrophes “hyperbolic umbilic” are shown in the form of a system of algebraic inequalities that characterize the aperiodic robust stability in the stationary states of the system.

**Keywords :** gradient-velocity method of Lyapunov vector-functions, hyperbolic umbilic, self-organizing control system, stability

**Conference Title :** ICMAR 2022 : International Conference on Manufacture, Automation and Robotics

**Conference Location :** Rome, Italy

**Conference Dates :** August 30-31, 2022