SIMION STOILOW INSTITUTE OF MATHEMATICS OF THE ROMANIAN ACADEMY

IMAR Monthly Lecture

Several control problems for deterministic and stochastic systems

Vasile Drăgan
IMAR

Tuesday, December 22, 2026, 12:00
IMAR, *Miron Nicolescu* amphitheatre

Abstract: We consider optimal control problems for systems evolving in continuous-time under the assumption that for the synthesis of control with desired properties the values of the state parameters involved in the computation of the control are available only at discrete-time instances $t_0 < t_1 < .... < t_k < .....$ The values of the controls are kept constant between two consecutive measurements. In this way the admissible controls are piecewise constant controls.

In the case of a deterministic process modeled by a system of linear differential equations, such an optimal control problem may be converted into an equivalent discrete-time optimal control problem. The solution of the associated optimal control problem provides a control with acceptable performances for original problem.

An optimal control problem for a stochastic process (under the assumptions that only measurements at discrete-time instances are available) can be reformulated as an equivalent optimal control problem for a stochastic system controlled by impulses. The solution of this equivalent optimal control problem provides a control with desired properties for the original stochastic optimal control problem.