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ESTIMATION OF INITIAL FUNCTIONS FOR SYSTEMS WITH DELAYS FROM DISCRETE MEASUREMENTS

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ABSTRACT

The work presents a gradient-based approach to estimation of initial functions of time delay elements appearing in models of dynamical systems. It is shown how to generate the gradient of the estimation objective function in the initial function space using adjoint sensitivity analysis. It is assumed that the system is continuous-time and described by ordinary differential equations with delays but the estimation is done based on discrete-time measurements of the signals appearing in the system. Results of gradient-based estimation of initial functions for exemplary models are presented and discussed.

REFERENCES

[1] K. Fujarewicz: *Estimation of initial functions for systems with delays from discrete measurements*, Mathematical Biosciences and Engineering 14(1) (2017), 165–178, DOI 10.3934/mbe.2017011.