

**Subject**

Synthesis of moving switching curve based on nonstationary streaming data

**Supervisors, contact, place of research**

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**Project Description**

This topic, from the streaming data analysis domain, also contains elements of control engineering. The task relies on compression of data, given in the form of a nonstationary data stream, for the purposes of synthesis of switching surface in its adaptive form, i.e. making its time-variable shape and position dependent on successively acquired information concerning the process. Such systems constitute the base for contemporary variable structure control (also in sliding and robust control). The research will be carried out for selected nonlinear dynamical systems, also described by differential equations with discontinuous right-hand side. The conditional approach will be also investigated, where the characteristics of the object are significantly dependent on quantities, whose current value can be acquired successively, which often allows the inference process to be considerably more precise.

Mathematical predispositions, programing ability and basic knowledge of control engineering are required from the Ph.D.-student.

**Bibliography**

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2. Kulczycki P. (2000) „Fuzzy Controller for Mechanical Systems”, *IEEE Transactions on Fuzzy Systems*, vol. 8, no. 5, pp. 645-652.
3. Kulczycki P., Charytanowicz M. (2013) „Conditional Parameter Identification with Different Losses of Under- and Overestimation” *Applied Mathematical Modelling*, vol. 37, no. 4, pp. 2166-2177.
4. Silva J., Faria E., Barros R., Hruschka E., de Carvalho A., Gama J. (2013) „Data stream clustering: A survey”, *ACM Computing Surveys*, vol. 46, no. 1, paper 13.

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