Theme	**Model based control of robots (MT1)**
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Key Words	Industrial robots, predictive control, real-time control, modeling, mathematical-physical analysis
Specification	Robots and manipulators are fundamental parts in industrial production. They are especially characterized by their flexibility in the use and certain degree of autonomous intelligence. This character enables them to change their environment contrary to other production machines. With development of new robot structures, the requirements on their control grow too. Perspective direction is the use of the controllers constructed on model-based control strategies. These strategies enable to spread the energy to individual robot drives and by this their full utilization. The aim of the theme is a development of algorithms of predictive control, which belongs to the model-based control strategies.
Tasks	1. On the basis of mathematical-physical analysis compose mathematical model of given robot. 2. Study the basis of the predictive control design and derive suitable selected its algorithm. 3. Prove this algorithm by simulation and in case of availability of laboratory model of considered robot, prove the algorithm even on this model.
Literature	1. Maciejowski, J., M.: Predictive Control with Constrains, Prentice Hall, London 2002. 2. Rossiter, J., A.: Model-Based Predictive Control – A Practical Approach, CRC Press, London 2003. 3. Other full-text sources: http://as.utia.cas.cz/asc - Link to GPC pages.
Note	Theme for master's thesis.