Theme	**Predictive control for industrial machines and robots (Dis1)**
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Key Words	Industrial robots, predictive control, CNC control, real time control, modeling, mathematical-physical analysis
Specification	Aim of the work is design, software optimization and implementation of predictive control algorithms form mechatronic structures forming the basis of the industrial machines and robots. Implementation of algorithms is assumed in the form of autonomous functions, for independent tests and experiments on different types of mechatronic configurations.
Tasks	1. Study control algorithms of predictive control. 2. Make model (mathematical-physical) analysis and compose mathematical model of the real mechatronic structure. 3. Analyze dimensions of functional parameters, inputs and outputs. 4. Design suitable optimization procedure of on-line processing of CNC programs for control algorithms. 5. Implement designed control algorithms by M functions and S functions for MATLAB - Simulink with appropriate coders.
Literature	1. Belda, K., Böhm, J., Píša, P.: Concepts of Model-Based Control and Trajectory Planning for Parallel Robots. Proc. of 13th IASTED Int. Conf. on Robotics and Applications 2007, Würzburg, Germany. pp. 15-20. 2. Bobál, V., Böhm, J., Fessl, J., Macháček, J.: Digital Self-tuning Controllers Algorithms, Implementation and Applications, Springer 2005. 3. J. A. Rossiter: Model-Based Predictive Control, A Practical Approach, London, CRC Press, 2003. 4. Other full-text sources: http://as.utia.cas.cz/asc - Link to GPC pages.
Note	Theme for dissertation.