

MAXIMUM CAPABILITIES OF ADAPTIVE CONTROL IN THE  $\ell_\infty$  SETTING.  
EXAMPLES.

Adaptive control in the  $\ell_\infty$  setting deals with discrete-time systems under parametric uncertainties, bounded external disturbances and norm or gain bounded uncertainties. Deterministic setting of control problems comes to nonidentifiability of controlled systems and set-membership approach to systems estimation. A general approach to synthesis of maximum capabilities adaptive control is based on treating the control criterion as the identification criterion. Computational tractability of this approach is demonstrated on three problems of adaptive optimal control where control criteria are linear or linear-fractional in estimated parameters and polyhedral estimates of the latter are involved. The first problem deals with minimum-phase SISO systems under bounded disturbance and control delay. The second one is a problem of optimal robust synthesis for known SISO plant under coprime factor perturbations with unknown norms of perturbations and bounded disturbance. The third problem addresses adaptive optimal tracking for SISO plant under nonparametric bounded Lipschitz uncertainty. A compensation of the Lipschitz uncertainty is achieved with a parallel use of two different models, one of which ensures the stabilization of closed loop system while the second one provides the asymptotic optimality of control with a prescribed accuracy.

## Biography

Victor F.Sokolov received Diploma degree in Mathematics and Candidate of Sciences (Ph.D.) degree from the Saint-Petersburg State University in 1974 and 1979, respectively, and Doctor of Sciences Degree (Habilitation) in physics and mathematics from the Institute of Control Sciences of the Russian Academy of Sciences, Moscow, in 1998. Since 2004 he holds a position of Leading Research Fellow at the Institute of Physics and Mathematics, Komi Science Center of Russian Academy of Sciences and is a part-time Professor of Mathematics at Syktyvkar State University. He is the author and coauthor of more than 90 journal and conference papers and the book "Robust control under bounded disturbances" (2011, in Russian). His research interests include adaptive, robust, and optimal control, model validation and errors quantification.