

# Seminarium

Katedra Systemów Automatyki zaprasza na seminarium poświęcone systemom adaptacyjnym, które odbędzie się w dniu 8 października 2018 r. (poniedziałek) w godzinach 14:15-17 w sali 122 Wydziału Elektroniki, Telekomunikacji i Informatyki Politechniki Gdańskiej (w "starym" budynku Elektroniki). W trakcie seminarium wygłoszone zostaną 3 odczyty:

## Old and new challenges of adaptive control

**Prof. Brian D.O. Anderson**

Hangzhou Dianzi University  
The Australian National University

**Abstract:** Adaptive control has promised much, delivered in some areas, and failed to deliver in others. The talk commences by presenting some big mistakes and one fatal mistake revealed in the history of adaptive control, most due to theoreticians. Some pervasive questions of adaptive control, not yet addressed, are also presented. Some of these flow from the desirability to have guarantees on closed-loop transient behavior during the learning phase; almost no results are however known. New developments, some suited to treating nonlinear plants, will also be presented in high level summary form.

## Selected topics and open problems in the radar-related research

**Prof. Michał Meller**

Gdańsk University of Technology  
Department of Automatic Control

**Abstract:** During this presentation, we will deliver a quick survey of the radar-related research activity at Gdask University of Technology. The first half of the talk will be dedicated to the direction of arrival estimation problem. We will present the, recently proposed, minimax robustification of the conditional maximum likelihood estimator of an elevation for the low grazing angles and its extension using the model-averaging techniques. We will also shortly discuss the problem of estimating the azimuth angle in the rotating-array radar using the agility modes.

In the second half of the talk, we will introduce the generalized space-time filtering problem, which extends the space-time adaptive processing (STAP) to the system case. We will present the basic (Capon-like) adaptive estimator and show how one can generalize the classical STAP performance metrics and data-reduction techniques to fit the system framework. We will also share some of our doubts and discuss future research in the area.

## **Generalized Savitzky-Golay filters for identification and smoothing of nonstationary processes**

**Dr. Marcin Ciołek**

Gdańsk University of Technology

Department of Automatic Control

**Abstract:** The problem of identification of nonstationary processes using noncausal estimation schemes is considered and a new class of identification algorithms, combining the basis functions approach with local estimation technique, is described. Unlike the classical basis function estimation schemes, the proposed noncausal weighted basis function estimators are not used to obtain interval approximations of the parameter trajectory, but provide a sequence of point estimates corresponding to consecutive instants of time. Based on the results of theoretical analysis, the paper addresses and solves all major problems associated with implementation of the new class of estimators, such as rationalization of the choice of functional basis and the shape of the local estimation window, adaptive selection of the number of basis functions and the window size, and reduction of complexity of the computational algorithms. so share some of our doubts and discuss future research in the area.