



“Gheorghe Asachi” Technical University of Iasi, Romania



EVALUATION OF CONTROL TECHNIQUES APPLIED ON A WASTEWATER TREATMENT PROCESS WITH ACTIVATED SLUDGE

Daniela Carp, Marian Barbu*

*“Dunărea de Jos” University of Galați Department of Automatic Control and Electrical Engineering
47 Domnească Street, 800008, Galați, Romania*

Abstract

Wastewater treatment processes with activated sludge are described in the specialized literature by complex models with nonlinear parameterization, such as for example Activated Sludge Model ASM1, ASM2 or ASM3. Under these conditions, the design of control structures using the state space representation is very difficult. Suitable techniques to approach the control of these processes are using control structures based on an input-output model or using control structures obtained without even knowing the process model. In this paper two techniques of this type are analyzed: a data driven technique, Virtual Reference Feedback Tuning (VRFT), and a robust control technique, Quantitative Feedback Theory (QFT). The control structures designed by the two methods are implemented using a wastewater treatment plant implemented in the simulation software SIMBA for which a complex influent was considered. The influent includes information on water temperature and gives data for a period of one year. The analysis of the two methods considers the quality of the obtained control results but, at the same time, the difficulty of implementing the two methods.

Key words: data driven control, robust control, wastewater treatment plant

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