This article can be cited as St. Preitl, R.-E. Precup and Zs. Preitl, Aspects Concerning the Tuning of 2-DOF Fuzzy Controllers, Proceedings of X[th] Triennial International SAUM Conference on Systems, Automatic Control and Measurements SAUM 2010, Eds. Nikolić, V., Antić, D. and Mitić, D., Niš, Serbia, pp. 210-219, 2010.

Aspects Concerning the Tuning of 2-DOF Fuzzy Controllers

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***Abstract* – The paper presents aspects concerning the tuning of two-degree-of-freedom (2-DOF) fuzzy controllers focused on 2-DOF PI-fuzzy controllers and 2-DOF PID-fuzzy controllers. 2-DOF Mamdani and Takagi-Sugeno fuzzy control system structures are offered. The tuning is based on mapping the parameters of the linear PI and PID controllers to the parameters of the fuzzy controllers in terms of the modal equivalence principle. The linear controllers are tuned by Preitl's and Precup's Extended Symmetrical Optimum method. Some experimental results dealing with the speed control of a servo system are given.**

***Key words:* 2-DOF PI-fuzzy controllers, 2-DOF PID-fuzzy controllers, PI controllers, PID controllers**

ACKNOWLEDGMENT

This work was supported by the CNCSIS and CNMP of Romania and the co-operation between the Óbuda University, Budapest, Hungary, the University of Ljubljana, Slovenia, and the "Politehnica" University of Timisoara, Romania, in the framework of the Hungarian-Romanian and Slovenian-Romanian Intergovernmental Science & Technology Cooperation Programs.

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SAUM 2010 CONFERENCE

PRELIMINARY PROGRAM

SESSIONS OVERVIEW

Wednesday, November 10, 2010		
Time	*Activities*	*Place*
10:00 – 11:00	Registration	
11:00 – 12:00	Opening Ceremony	
12:00 – 13:00	Cocktail	
13:00 – 14:30	**Session A:** ROBOTICS I	Room 1
14:45 – 16:15	**Session B:** INTELLIGENT CONTROL	Room 1
16:30 – 18:30	**Session C:** NONLINEAR SYSTEMS	Room 1

Thursday, November 11, 2010		
Time	*Activities*	*Place*
10:00 – 11:30	**Session D:** HYDRAULIC SYSTEMS	Room 1
10:00 – 11:30	**Session E:** ROBOTICS II	Room 2
12:00 – 14:00	**Session F:** INFORMATION AND COMMUNICATION TECHNOLOGIES I	Room 1
12:00 – 14:00	**Session G:** INDUSTRIAL AND PROCESS CONTROL I	Room 2
15:00 – 17:00	**Session H:** MEASUREMENT AND INSTRUMENTATION I	Room 1
15:00 – 17:00	**Session I:** GEOGRAPHIC INFORMATION SYSTEMS, WIRELESS SENSOR NETWORKS AND WEB	Room 2
15:00 – 17:00	**Session J:** FUZZY CONTROL	Room 3
20:00	Gala Dinner	

Friday, November 12, 2010		
Time	*Activities*	*Place*
10:00 – 12:00	**Session K:** INFORMATION AND COMMUNICATION TECHNOLOGIES II	Room 1
10:00 – 12:00	**Session L:** MEASUREMENT AND INSTRUMENTATION II	Room 2
10:00 – 12:00	**Session M:** INDUSTRIAL AND PROCESS CONTROL II	Room 3
12:30 – 15:00	**Session N:** APPLIED MATHEMATICS AND MECHANICS	Room 1
12:30 – 15:00	**Session O:** SYSTEM IDENTIFICATION AND MODELING	Room 2
15:00	Closing Ceremony	

Session I: GEOGRAPHIC INFORMATION SYSTEMS, WIRELESS SENSOR NETWORKS AND WEB

Chairpersons: *J. Žunić, D. Janković*

Session I	I1 • Invited paper
R. Arnaudov, L. Stoimenov SENSOR WEB FOR MONITORING AND CONTROL OF POWER SUPPLY NETWORKS	
Session I	I2 • Regular paper
Č. Vasić, D. Rančić, B. Predić, D. Mitić ONE APPROACH TO DYNAMIC RELOCATION OF EMERGENCY AMBULANCE VEHICLES BASED ON GIS	
Session I	I3 • Regular paper
J. Trpovski, E. Lazarevska A REAL-TIME GPS BASED VEHICLE TRACKING, NAVIGATING AND MONITORING SYSTEM	
Session I	I4 • Regular paper
P. Balzhiev, I. Dochev, N. Stoyanov, R. Arnaudov WIRELESS SENSOR NETWORK FOR MONITORING THE MICROCLIMATE IN BIG PUBLIC BUILDINGS AND COMPLEXES	
Session I	I5 • Regular paper
K. Benkič, M. Malajner, Ž. Čučej UNSLOTTED CSMA/CA IN IEEE 802.15.4: PERFORMANCE AND ITS LIMITATIONS	
Session I	I6 • Regular paper
M. Malajner, P. Planinšič, K. Benkič, Ž. Čučej UNCERTAINTY OF TWO-RAY PROPAGATION MODEL USING IN WSN LOCALIZATION	

Session J: FUZZY CONTROL

Chairpersons: *V. Kh. Pshikhopov, Ž. Ćojbašić*

Session J	J1 • Invited paper
S. Preitl, R. Precup, Z. Preitl ASPECTS CONCERNING THE TUNING OF 2-DOF FUZZY CONTROLLERS	
Session J	J2 • Regular paper
S. Jovanović, M. Milovanović, M. Matijević FUZZY LOGIC CONTROLLER DESIGN FOR SEMI-ACTIVE VEHICLE SUSPENSION SYSTEMS	
Session J	J3 • Regular paper
D. Lazić, Z. Čojbašić, M. Ristanović GENETIC OPTIMIZATION OF CONVENTIONAL AND FUZZY ELECTROMECHANICAL AEROFIN CONTROL	
Session J	J4 • Regular paper
V. M. Ojleska, T. Kolemishevska-Gugulovska, G. M. Dimirovski INFLUENCE OF THE STATE SPACE PARTITIONING INTO REGIONS WHEN DESIGNING SWITCHED FUZZY CONTROLLERS	