3rd IFAC Workshop on Advanced Fuzzy and Neural Control 2007

Valenciennes, France
29-30 October 2007

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IFAC Secretariat
Schlossplatz 12
A-2361 Laxenburg
Austria

Phone: +43 2236 71 447
Fax: +43 2236 72 859

secretariat@ifac-control.org

IFAC International Federation of Automatic Control

3rd IFAC Workshop on Advanced Fuzzy and Neural Control 2007

FINAL PROGRAM

October 29-30, 2007, Valenciennes- France.

http://www.univ-valenciennes.fr/congres/afnc07/

Monday October 29

08:00 – 09:45 Registration

09:45 – 10:30 **MO1 Opening Session**

Pr. D. Coutellier,
Vice President of the University of Valenciennes et du Hainaut Cambrésis
Pr. E. Markiewicz,
Director of the LAMIH UMR CNRS 8530
Pr. R. Babuska,
IFAC TC 3.2 general chair
Pr. T.M. Guerra
IFAC AFNC'07 general chair

10:30 – 12:30 **MO2 Vehicle Modeling & Control**

Chairman : Pr. R.E. Precup, University of Timisoara

- MO2-1 : "*Multi-model based controller for lateral vehicle dynamics: a fuzzy approach*", W. El Messoussi, A. Rabhi, O. Pagès, A. El Hajjaji.
- MO2-7 : "*LQG with fuzzy correction mechanism in tilting railway vehicle control design*", H.Zamzuri, A.C.Zolotas, R.M.Goodall.
- MO2-13 : "*RBF based feedforward feedback control for air-fuel ratio of SI engines*", Y. Zhai, D. Yu.
- MO2-19 : "*Neural networks for controlling and modelling future low temperature combustion technologies*", K. Hoffmann, D. Seebach, S. Pischinger, D. Abel.
- MO2-25 : "*Data-based modelling of nonlinear systems using a modified LOLIMOT Algorithm*", J. Rezaie, F. Tourani, B. Moshiri, B.N. Araabi.

12:30 – 14:00 Lunch

14:00 – 15:00 **MO3 Invited Talk**

Chairman : Pr. R. Babuska, Delft University of Technology

"*Recent Advances in Adaptive Neural Network Control*", **Pr. Shuzhi Sam Ge** (Department of Electrical & Computer Engineering, National University of Singapore)

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15:00 – 16:30 **MO4 Control of Takagi Sugeno Fuzzy Models**
Chairman : Pr. A. Sala, Universidad Politecnica Valencia

- MO4-31 : "*K-Samples variation analysis for Discrete-Time Takagi-Sugeno models stabilization: Complexity reduction*", A. Kruszewski, T.M. Guerra, M. Bernal.
- MO4-37 : "*TS fuzzy controllers for cascaded systems*", Zs. Lendek, R. Babuska, B. De Schutter.
- MO4-43 : "*LMI based H∞ controller design for uncertain Takagi-Sugeno descriptors subject to external disturbances*", T. Bouarar, K. Guelton, N. Manamanni.
- MO4-49 : "*Sufficient and asymptotic necessary conditions for the stabilization of Takagi-Sugeno model*", A. Kruszewski, A. Sala, T.M. Guerra, C. Arino.

16:30 – 17:00 Coffee break

17:00 – 18:30 **MO5 Predictive control**
Chairman : Pr. N. Manamanni, University of Reims Champagne-Ardenne

- MO5-55 : "*Efficient fuzzy predictive algorithms with integrated economic optimization: a case study*", P.M. Marusak.
- MO5-61 : "*State estimation and predictive control using finite Markov chains*", E. Ikonen, K. Najim, U. Kortela.
- MO5-67 : "*Multiple ARX model-based air-fuel ratio predictive control for SI engines*", T. Polóni, B. Rohaľ-Ilkiv, T.A. Johansen.
- MO5-73 : "*Two nonlinear predictive control algorithms based on structured neural models*", M. Lawrynczuk.

18:30 – 19:30 **TC 3.2 meeting**

19:30 – late : **Gala diner**

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Tuesday October 30

09:00 – 11:00 **TU1 Fuzzy Control and Modeling**
Chairman : Pr. M. Dambrine, University of Valenciennes et du Hainaut Cambrésis

- TU1-79 : "*Guaranteed cost control for uncertain discrete delay T-S fuzzy system*", R. Wang, T.M. Guerra, A. Kruszewski, J. Pan.
- TU1-85 : "*Sub-optimal output tracking control design for uncertain T-S models*", B. Mansouri, A. Kruszewski, K. Guelton, N. Manamanni.
- TU1-91 : "*A decoupled multiple model approach for state estimation of nonlinear systems subject to delayed measurements*", R. Orjuela, B. Marx, J. Ragot, D. Maquin.
- TU1-97 : "*Control-oriented modeling of hydrostatic transmissions considering leakage losses*", H. Schulte.
- TU1-103 : "*Implementation of a fuzzy logic control for a silo's level regulation in stone quarries*", H. Coppier, M. Chadli, S. Bruey, O. Guthmann, P. Delesalle.
- TU1-109 : "*Probabilistic clustering algorithms for fuzzy rules decomposition*", P. Salgado, G. Igrejas.

11:00 – 11:30 Coffee break

11:30 – 12:30 **TU2 Invited Talk**
Chairman : Pr. T.M. Guerra, University of Valenciennes et du Hainaut Cambrésis

"*Reducing the gap between fuzzy and nonlinear control*", **Dr. Antonio Sala** (Systems and Control Engineering Department, Universidad Politecnica Valencia, Spain) 115

12:30 – 14:00 Lunch

14:00 – 15:30 **TU3 Learning and neural control**
Chairman : Pr. S.S. Ge, National University of Singapore

- TU3-121 : "*Indirect iterative learning control of Takagi-Sugeno fuzzy systems*", J.Y. Dieulot, P. Borne.
- TU3-127 : "*PI-fuzzy controller design based on an optimization approach*", R.E. Precup, S. Preitl, E.M. Petriu.
- TU3-133 : "*Inversion of a semi-physical dispersion model*", L. Bourgois, G. Roussel, M. Benjelloun.
- TU3-139 : "*Application of neural networks to virtual reference feedback tuning controller design*", A. Esparza, A. Sala.

15:30 – 16:00 Coffee break

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16:00 – 18:00 **TU4 Adaptive control**
Chairman : Pr. E. Ikonen, University of Oulu

- TU4-145 : "*Adaptive fuzzy backlash compensation for a new dynamic flight simulator*", Z. Amara, J. Bordeneuve-Guibe.
- TU4-151 : "*Adaptive variable structure fuzzy wavelet network based controller for nonlinear systems*", A. Hussain, N. Essounbouli, A. Hamzaoui.
- TU4-157 : "*Adaptive NN control for a class of non-affine nonlinear systems with unknown control gain*", B. Ren, S.S. Ge, T.H. Lee.
- TU4-163 : "*Direct adaptive fuzzy control of a class of nonlinear systems with input saturation*", S. Labiod, T.M. Guerra.
- TU4-169 : "A*daptive neuro-fuzzy control design for two cooperating robot manipulators handling a flexible beam*", A. Ashayeri, M. Eghtesad, A. Khebreh.

18:00 **Closing session**