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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.
- MO2-2 : "*LQG with fuzzy correction mechanism in tilting railway vehicle control design*", H.Zamzuri, A.C.Zolotas, R.M.Goodall.
- MO2-3 : "*RBF based feedforward feedback control for air-fuel ratio of SI engines*", Y. Zhai, D. Yu.
- MO2-4 : "*Neural networks for controlling and modelling future low temperature combustion technologies*", K. Hoffmann, D. Seebach, S. Pischinger, D. Abel.
- MO2-5 : "*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)

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

- MO4-1 : "*K-Samples variation analysis for Discrete-Time Takagi-Sugeno models stabilization: Complexity reduction*", A. Kruszewski, T.M. Guerra, M. Bernal.
- MO4-2 : "*TS fuzzy controllers for cascaded systems*", Zs. Lendek, R. Babuska, B. De Schutter.
- MO4-3 : "*LMI based H∞ controller design for uncertain Takagi-Sugeno descriptors subject to external disturbances*", T. Bouarar, K. Guelton, N. Manamanni.
- MO4-4 : "*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

- MO5-1 : "*Efficient fuzzy predictive algorithms with integrated economic optimization: a case study*", P.M. Marusak.
- MO5-2 : "*State estimation and predictive control using finite Markov chains*", E. Ikonen, K. Najim, U. Kortela.
- MO5-3 : "*Multiple ARX model-based air-fuel ratio predictive control for SI engines*", T. Polóni, B. Rohaľ-Ilkiv, T.A. Johansen.
- MO5-4 : "*Two nonlinear predictive control algorithms based on structured neural models*", M. Lawrynczuk.

18:30 – 19:30 **TC 3.2 meeting**

19:00 – late **Gala diner**

Tuesday October 30

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

- TU1-1 : "*Guaranteed cost control for uncertain discrete delay T-S fuzzy system*", R. Wang, T.M. Guerra, A. Kruszewski, J. Pan.
- TU1-2 : "*Sub-optimal output tracking control design for uncertain T-S models*", B. Mansouri, A. Kruszewski, K. Guelton, N. Manamanni.
- TU1-3 : "*A decoupled multiple model approach for state estimation of nonlinear systems subject to delayed measurements*", R. Orjuela, B. Marx, J. Ragot, D. Maquin.
- TU1-4 : "*Control-oriented modeling of hydrostatic transmissions considering leakage losses*", H. Schulte.
- TU1-5 : "*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.
- TU1-6 : "*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)

12:30 – 14:00 Lunch

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

- TU3-1 : "*Indirect iterative learning control of Takagi-Sugeno fuzzy systems*", J.Y. Dieulot, P. Borne.
- TU3-2 : "*PI-fuzzy controller design based on an optimization approach*", R.E. Precup, S. Preitl, E.M. Petriu.
- TU3-3 : "*Inversion of a semi-physical dispersion model*", L. Bourgois, G. Roussel, M. Benjelloun.
- TU3-4 : "*Application of neural networks to virtual reference feedback tuning controller design*", A. Esparza, A. Sala.

15:30 – 16:00 Coffee break

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

- TU4-1 : "*Adaptive fuzzy backlash compensation for a new dynamic flight simulator*", Z. Amara, J. Bordeneuve-Guibe.
- TU4-2 : "*Adaptive variable structure fuzzy wavelet network based controller for nonlinear systems*", A. Hussain, N. Essounbouli, A. Hamzaoui.
- TU4-3 : "*Adaptive NN control for a class of non-affine nonlinear systems with unknown control gain*", B. Ren, S.S. Ge, T.H. Lee.
- TU4-4 : "*Direct adaptive fuzzy control of a class of nonlinear systems with input saturation*", S. Labiod, T.M. Guerra.
- TU4-5 : "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**