

Pr. Dimitri LEFEBVRE (PRCE1)

GREAH – EA3220 (Automatic Control and Electrical Engineering Research Group)

Normandie Université

Teaching: IUT Le Havre- GMP

Research: ULH - GREAH

HIGHER EDUCATION AND DIPLOMAS

- 2000 : **HDR Degree** entitled « Contributions to the modelling control and diagnosis of discrete event systems». November 29, 2000 with Technological University in Belfort Montbéliard (FR).
- 1994: **Ph. D Degree** in Manufacturing, Automatic and Computer Science entitled « Dynamic compensation for generalized systems», December 14, 1994 with University of Science and Technology in Lille (FR).
- 1992: **Master degree in engineering and in research from** Ecole Centrale de Lille.

WORKING EXPERIENCE

- **Professor** with Normandie Université, since September 2001, Department of Mechanical and Manufacturing Engineering (GMP). Research activities with GREAH-EA3220.
- **Assistant Professor** with Institute of Technology in Belfort - Montbéliard from January 1996 to August 2001, Department of Electrical Engineering and Computer Science (GEII). Research activities with the Systems and Transportation Laboratory (SeT) in Technological University from Belfort Montbéliard.
- **Scientific Officer** at French embassy in Belgium from October 1994 to December 1995.

RESEARCH ACTIVITIES

Professor with Normandie Université, since September 2001 in the Department of Mechanical and Manufacturing Engineering (GMP).

From 2007 to 2012, head of the Electrical Engineering and Automatic Research Group (GREAH – EA 3220) of university Le Havre. GREAH has 17 Ph. D members (5 Professors and 12 Assistant Professors) and 18 Ph. D students working on projects that concern diagnosis and safe control methods for continuous and discrete event systems in the domains of electrical engineering, transportation, manufacturing and robotics.

From 2012 to 2017, assistant head GREAH – EA 3220,

From 2012 up to now, member of the executive board of CNRS / GDR MACS.

Scientific contributions are organized according to the following domains:

- Discrete event systems, Petri nets
- Continuous systems, complex systems
- Fault detection and diagnosis methods
- Control theory
- Performance evaluation and reliability
- Applications to manufacturing, transportation and robotics.

The most important part of my research activity is devoted to (i) the fault detection and diagnosis, (ii) the control design of discrete event systems based on Petri net models with a frequent use of timed information and stochastic processes.

- Member of CNRS / GDR – MACS (groups: Safety and Supervision of Systems (S3), Hybrid Dynamical Systems (SDH); Discrete Event Systems (SED)).
- Member of IEEE, Member of IFAC (TC 1.3).

Publications and scientific production (from 1997-01 to 2017-05)

- 106 papers in international journals.
- 14 participations or chapter in books
- More than 30 invited papers in international conferences
- More than 180 regular contributions in international conferences.

- Advisor for 26 Ph.D. students and 2 Habilitation (HDR).
- Participation to 42 participations to Ph.D. defense committees in different places in France and also abroad.

Reviewing activities

- Co-chair for «IFAC - DCDS» 2015, Cancun, Mexico.
- Associate editor for INCOM, ICINCO, and SYSTOL conferences
- Editor of Inderscience Publishers “International Journal of Adaptive and Innovative Systems» from 2008 to 2010
- Reviewer for journals: IEEE-SMC, IEEE-TASE, IEEE-TAC, Elsevier Automatica, Elsevier NAHS, Elsevier CEP Sage Publishing JRR, Springer DEDS,...
- Member of IPC for more than 40 IEEE or IFAC conferences

Accreditations

Research activities are accredited by:

- The council of Region Normandie : CPER 2000-2006 and 2007 - 2013 Project « MRT-DDSMRI»
- The National Educational and Research Council (MST) : National Program 2007- 2011, PPF “Risk Management”
- The National Center for Scientific Research Activities (CNRS) : Specific Research Activity 193, 2003 - 2004 «Diagnosis of Hybrid Dynamical Systems»; PEPS MASPAN, 2014, "Panic analysis with weak signals
- The Foreign Affairs Council (MAE) : CEDRE Project 2004 – 2005 and 2009-2010 “Diagnosis for electrical and industrial systems”, PROFAS Program 2009 – 2010 and 2010 -2011
- The AUF Agency :PCSI Program 2008-2009, Project “Risk and Diagnosis”
- The European Union : FEDER 2016-2019 Project « TERA- MRT-MADNESS»

TEACHING ACTIVITIES

Lectures for graduate and undergraduate students in the domains

- Mathematics
- Control theory
- Stochastic processes
- Reliability analysis

List of journal papers (from 2007 to 2017 by chronological order)

- [1] Lefebvre D., Delherm C., Fault detection and isolation of discrete event systems with Petri net models, *IEEE – TASE*, Vol. 4, no. 1, pp. 114 – 118, January 2007 (IF: 1.229, 2007).
- [2] Lebbal M., Chafouk H., Hoblos G., Lefebvre D. Using phase diagram to modeling and identification of non-linear systems by a set of linear models : Apply to throttle valve, in special issue on “Intelligent Monitoring and Control of Industrial Systems” of *International Journal of Information and Systems Sciences*, Vol. 3, no. 1, pp. 67 – 87, January 2007.
- [3] Lefebvre D., Delherm C., Leclercq E., Druaux F., Some contributions with Petri nets for the modelling, analysis and control of HDS, *Nonlinear Analysis*, Elsevier, vol. 1 pp. 451 – 465, 2007 (IF: 1.487, 2010).
- [4] Brethé J.F., Lefebvre D., Risk Ellipsoids and Granularity Ratio for Industrial Robots, *International Journal of Factory Automation, Robotics and Soft Computing* ISSN 1828 – 6984, no. 2, pp 93 – 101, April 2007.
- [5] Lefebvre D., Aubry D., Chafouk H., Combastel C., Domlan E.A., Graton, Hoblos G., Kajdan R., Kratz F., Lalami A., Lebbal M., Maquin D., Ragot J., Diagnostic des SDH : quelques contributions issues des approches continues, *JESA*, special issue on Hybrid Systems, vol. 41, no 7-8, pp 885 – 912, 2007.
- [6] Zerkaoui S., Druaux F., Leclercq E., Lefebvre D., Robust stability analysis of a adaptive control based on recurrent ANN, *Int. J. Modelling, Identification and Control*, Vol. 5, no. 1, pp14 -26, 2008 (IF: 0.232, 2008).
- [7] Lefebvre D., Firing sequences estimation in vector space over Z_3 for ordinary Petri nets, *IEEE – Trans. SMC Part A*, vol.38, no. 6, pp. 1325-1336, november 2008 (IF 0.867, 2007).
- [8] Tolba C. Lefebvre D., Thomas P., El Moudni A., Commande des feux de signalisation par réseaux de Petri hybrides, *JESA*, Vol. 42, no.5, pp.579-612, 2008.
- [9] Zerkaoui S., Druaux F., Leclercq E., Lefebvre D., Improving the robustness and stability properties of neural adaptive control for non-linear systems, *International Journal of Factory Automation, Robotics and Soft Computing* ISSN 1828 – 6984, pp. 81-87, 2008.
- [10] Koridak L.A., Rahli M., Lefebvre D., Younes M., Optimisation du dispatching électrique et de l’émission des gaz par des algorithmes génétiques, *Acta Electrotechnica*, vol. 49, no.2, pp. 194- 99, 2008.
- [11] Mustapha O, Khalil M., Hoblos G, Chafouk H., Lefebvre D., Fault detection algorithm using DCS method combined with filters bank derived from the wavelet transform, *International Journal of Innovative Computing, Information and Control ICIC*, ISSN 1313-1327, Volume 5, Number 5, 2009 (IF: 1.537, 2007).
- [12] Lefebvre D., Some challenges for a adaptive and innovative systems in the next future, *International Journal of Adaptive and Innovative Systems*, ISSN: 1740-2107, Vol. 1, no. 1, pp. 1 -12, 2009.
- [13] Ould El Mehdi S., Leclercq E., Lefebvre D., Identification of stochastic and deterministic stochastic Petri net models for reliability analysis, *Proc. IMechE, Part O: Journal of Risk and Reliability*, Vol. 223(O1), pp. 13-26, 2009 (IF: 0.39; 2011).
- [14] Mboup A.B., Guerin F., Ndiaye P. A., Lefebvre D. Multi-model for the control design and diagnosis of multi-sources renewable energy systems, *Journal des Sciences pour l’Ingénieur*, Vol.11, pp. 1 - 12, 2009.
- [15] Zerkaoui S., Druaux F., Leclercq E., Lefebvre D., Stable adaptive control with recurrent neural networks for square MIMO non-linear systems, *Engineering Applications of Artificial Intelligence*, Vol. 12, no. 4-5, pp. 702-717, 2009 (IF: 1.851, 2009).
- [16] Lebbal M., Chafouk H., Hoblos G., Lefebvre D. On Modeling and Diagnosis of Hybrid Dynamical Systems, special issue on “Intelligent System Design and Development”, *Int. J. Intelligent Systems Technologies and Applications*, Vol. 7, No. 2, pp. 137 – 156, 2009 (IF: 0.667, 2007).
- [17] Zerkaoui S., Druaux F., Leclercq E., Lefebvre D., Indirect neural control for plant-wide systems: Application to the Tennessee Eastman Challenge Process, *Computers and Chemical Engineering*, Vol. 34, no. 2, pp. 232-243, 2010.
- [18] Lefebvre D., Multi steps diagnosis with Petri net models, *International Journal of Adaptive and Innovative Systems*, ISSN: 1740-2107, Vol. 1, no. 2, pp. 187 -197, 2010.
- [19] Atig A., Druaux F., Lefebvre D., Aberrahim K., Ben Abdennour R., A new neural adaptive control based on neural emulation of complex square MIMO systems, *International Review of Automatic Control (IREACO)*, vol.3, no.6, november 2010.

- [20] Mboup Alioune Badara, Guerin François, Ndiaye Pape Alioune, Lefebvre Dimitri, Control design for hybrid system based on dc /dc converters duty cycle value, *COMPEL*, volume 30, no. 1, pp. 310-335, 2011.
- [21] Lefebvre D., Design and time parameters identification for non markovian Petri net models: application to the reliability analysis, *Proc. IMechE, Part O: Journal of Risk and Reliability*, vol. 225(1), pp. 1-18, march 2011.
- [22] Lefebvre D., Leclercq E., Stochastic Petri nets identification for the faults detection and isolation of discrete event systems, *IEEE – Tran. SMC Part A*, vol. 41, nu. 2, pp 213-225, march 2011.
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- [25] F. Guerin, D. Lefebvre, A.B. Mboup, J.-Y. Paredé, E. Lemains, P.A. NDiaye, Performance Evaluation of Multi-sources Renewable Energy Systems, *IEEE Trans. Aut. and Science Eng.*, vol. 8, no.3, pp. 570-580, 2011.
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