# Brief Curriculum vitae
# 2014

*Gouzé Jean-Luc*

**Senior researcher**
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**Head of the BIOCORE (Biological control of artificial ecosystems) team**

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## Main Research interests

biomathematics, mathematical modelling of biological phenomena, population dynamics, ordinary differential equations, theory of non-linear systems and control, optimal management of renewable resources, bioreactors models, biochemical networks models.

## Academic experience

2010 Head of BIOCORE research team

1997 Research Director (Directeur de Recherche) INRIA, COMORE research group

1996 Head of COMORE research group (Modelling and Control of Renewable Resources), INRIA

1996 Tenure (Habilitation à diriger les recherches) (University of Nice)
title: Qualitative mathematical analysis of biological models
Board : J. Demongeot, R. Arditi, C. Lobry, E. Walter, P. Bernhard, P. Nival, A. Sciandra.

1983-1995 Researcher (Chargé de recherches) at INRIA, (Institut National de Recherches en Informatique et en Automatique) Sophia-Antipolis
MIAOU research group (Control theory)

1980-1983 Doctoral Thesis from the Paris XI University
Advisors: J.P. Changeux (neurobiologist, Institut Pasteur) and J.M. Lasry (mathematician, Paris IX)
"Sur la structuration de la jonction neuromusculaire; régression de la multiinnervation pendant le développement; modèle mathématique et simulation" (mathematical model of synaptic network)

1977-1980 Graduated from the engineering school Ecole Centrale de Paris (Applied Mathematics Department).
Master thesis : mathematical models of skin diving

Born 5/21/58 in Tours, France.

## Research programs, grants, industrial collaborations (2000 - 2014)

**ARC GDyn (2002-2004)**
Coordination of the action GDyn with H. de Jong (HELIX INRIA). The aim is the analysis of dynamical piecewise linear models of genetic regulatory networks (see http://www-sop.inria.fr/comore/arcgdyn/arcgdyn-eng.html). The ARC involves mathematicians, computer scientists, and biologists from the E.N.S. Ulm Paris, the INRIA Rhone-Alpes, Rocquencourt and Sophia-Antipolis, the Haute Alsace University (Mulhouse) and the Joseph Fourier University (Grenoble).

**Action ACI IMPBIO BacAttract (2004-2006)**
Action funded by the Ministère de la Recherche. The aim is the mathematical modelling and analysis of some well known gene networks.

**Action ACI IMPBIO MathResoGen (2004-2006)**
Mathematical modelling of genetic and metabolic networks

**AS Asinbio (2002-2004)**
Participant in the Action Spécifique “Observers for systems with unknown inputs” of the RTP50 “STIC et Environnement” funded by the CNRS.

**TELEMAC: 2001-2005**
Participation in the European project (with industrial partners) TELEMAC (Tele-monitoring and Advanced Tele-control of High-Yield Wastewater Treatment Plants); coordinated by O. Bernard (Comore) from the scientific point of view and B. Le Dantec (Ercim) for administration (see http://www.ercim.org/telemac). Partners are ERCIM, INRIA COMORE, INRA (Laboratoire des Biotechnologies de l’environnement, Narbonne), APPLITEK (captors, Belgium), Department of Applied Mathematics, Biometrics and Process Control, Gent University, Belgique), Council for the Central Laboratory of the Research Councils (CCLRC), Information Technology Department, (England), SPES (Information technologies, Italy), University of Santiago de Compostella (USC)(Spain), ENEA Waste water Treatment and Water Cycle Unit (Italy), AGRALCO ( Spain), PSPc (Belgium), Tequila SAUZA S.A. (Mexico), The University of

Guadalajara (UDG) (Mexico), ALLIED DOMECQ SPIRITS and WINE LTD. (DOMECQ UK), Allied Domecq Brasil Industria e Comercio Limitada (Brazil). The total budget was around 4.5 Meuros.

**European project HYGEIA (2005-2007)**
HYGEIA (Hybrid Systems for Biochemical Network Modeling and Analysis) is a NEST ADVENTURE STREP European project. The objective of HYGEIA is to exploit recent developments in the area of hybrid systems to address open problems in modeling and analysis of biochemical networks. Participants: Sosso, Helix, Comore (INRIA) Patras Univ. (Greece), European Molecular Biology Laboratory (Heidelberg) , Rockefeller University (New-York).

**European Network of Excellence HYCON(2005-2007)**
The objective of the NoE HYCON (Hybrid Control: Taming Heterogeneity and Complexity of Networked Embedded Systems) is establishing a durable community of leading researchers and practitioners who develop and apply the hybrid systems approach to the design of networked embedded control systems as found, e.g., in industrial production, transportation systems, generation and distribution of energy, communication systems, genetic systems (see http://www.ist-hycon.org/.)

**Shamash 2007 2010**
Shamash is a project funded by the ANR in the national program for research in bioenergy. Its objective is to produce biodiesel from microalgae. Shamash, coordinated by O. Bernard, includes 9 partners, for a total budget of 2.8 Millions Euros. The role of Comore is to design a model of the process in order to better understand the dynamical mechanisms that lead to the transient storage of lipids. The second step will then consist in defining optimal conditions to maximize the oil production. See http://www-sop.inria.fr/comore/shamash/

**ANR-MetaGenoReg 2006-2009** The objective of this project, funded by ANR (Systems Biology), is to model and analyze the interaction between metabolic and genetic regulations, with the example of the carbon metabolism of E. coli. Partners are Helix, Comore (INRIA), Univ. Joseph Fourier (Grenoble), and INSA Toulouse. The project is directed by D. Kahn (Helix, INRIA).

**GeMCo 2010 2014**
The objective of this project is to do model reduction, experimental validation, and control for the gene expression machinery in E. coli. The project is funded by ANR (2010-BLAN-0201-01) and coordinated by M. Chaves (Comore, INRIA)

**ColAge 2008 2014**
The goal of this joint INRIA-INSERM consortium is to study bacterial growth and aging by using mathematical modelling and computational predictions to design and implement a *de novo* biological system. This Large-Scale Initiative Action is partly funded by INRIA and supervised by H. Berry (Alchemy, INRIA).

**ANR-RESET 2012-** The objective of this project is to control the growth of E. coli cells in a precise way, by arresting and restarting the gene expression machinery of the bacteria in an efficient manner directed at improving product yield and productivity. RESET is an Investissements d'Avenir project in Bioinformatics (managed by ANR) and it is coordinated by H. de Jong (Ibis, Inria)

## PhD students (2000 - 2014)

S. Casagranda "Reduction of biological networks models", since Nov. 2013, UNSA. Supervisor: J.-L. Gouzé and D. Ropers (Ibis INRIA Grenoble)
I. Belgacem "Controle de systèmes de régulation génétique", since November 2011, UNSA. Supervisor: J.-L. Gouzé.
A. Carta, (2014) "Analysis and Control of models of biological regulatory systems. Application to growth control in E. coli", UNSA. Supervisors: J.-L. Gouzé and M. Chaves.
J. Rault, (2012) "Modélisation mathématique structurée en taille du zooplancton, UNSA. Supervisors: J.-L. Gouzé and E. Benoit.
I. Ndiaye, (2010) "Méthodes d'analyse de modèles de régulation cellulaire", UNSA, Supervisor: J.-L. Gouzé ; Co-Advisor: M. Chaves
G. Robledo, (2006) Quelques résultats sur la commande du chemostat (mathematical control of bioreactors), UNSA
V. Lemesle, *Modélisation mathématique structurée de la croissance cellulaire en chemostat : analyse et estimation* (Structured mathematical models for cellular growth in the chemostat) thèse de doctorat, UNSA, 2004
L. Mailleret, *Stabilisation globale de systèmes dynamiques positifs mal connus ; applications en biologie.* (Global stabilization of positive uncertain dynamical systems in biology) thèse de doctorat, UNSA, 2004
M. Verdoit, *Caractérisation et modélisation de la dynamique spatiale et saisonnière de populations benthiques et démersales exploitées de la mer Celtique* (Models for spatial dynamics of fishes) thèse de doctorat, university P.M. Curie, 2003
J. Arino, *Modélisation structurée de la croissance du phytoplancton en chemostat* (Structured models for phytoplankton growth in the chemostat) thèse de doctorat, university Joseph Fourier, 2001.

## Teaching activities

Present:
"Modeling biological networks", 4th year students, Génie Biologique, Polytech'Nice, University of Nice - Sophia Antipolis
"Discrete and continuous approaches to model gene regulatory networks", Master of Science in Computational Biology (M2), University of Nice - Sophia Antipolis.

Mathematical models in biology at the Master of biological oceanography from the University Pierre et Marie Curie, Paris VI, and EPU UNSA, until 2010

Past activities:
Modeling and control of bioprocesses at ISIA (Institut Supérieur en Informatique et Automatique, École des Mines de Paris).
CIMPA school in Tlemcen (Algéria, 2003) and Nouakchott (Mauritania, 2005); models of bioprocesses and fisheries.
School/workshop on mathematics and renewable resources at the Centro de Modelamiento Matematico of the Universidad de Chile (in Santiago, Chile, two weeks in April 2004).
Regular formations of mathematics and mathematical modelling to biologists (researchers) at INRA Lusignan.

# Other activities

Member of the INRIA committee supervising the doctoral theses,
Member of the committee of Labex SIGNALIFE of the University of Nice-Sophia-Antipolis, and of COREBIO PACA.
Member of the board of the SFBT (French Speaking Society for Theoretical Biology).
Member of the Commission Scientifique Spécialisée MBIA (evaluation committee for Mathematics, Biometry and AI) of INRA, that evaluates the scientific career of INRA researchers (until 2010).

Member of the Commission d'Evaluation (scientific committee for the evaluation of researchers) of INRIA (until 2005).
Organization of the evaluation of the BIO theme at INRIA (2005), see http://www-sop.inria.fr/comore/evaluation/

Reviewer for many journals SIAM Appl. Maths, Mathematical Biosciences, J. Process Control, J. Math. Biology, Systems and Control Letter, ... and conferences.

Participation in committees for PhD theses (regularly).

Program committee for (recently) POSTA ( Multidisciplinary International Symposium on Positive systems, theory and applications,), CIFA , "Stic et Environnement", BIOMATH ...
Expert committee for Aquae INRA/Cemagref projects, for RTP50 CNRS "STIC et Environnement".

# Publications

## Journals (1997 - 2014)

[1] W. Abou-Jaoudé, M. Chaves, and J.-L. Gouzé. Links between topology of the transition graph and limit cycles in a two-dimensional piecewise affine biological model. *Journal of Mathematical Biology*, 69(6-7):1461–1495, Dec. 2014.

[2] I. Belgacem and J.-L. Gouzé. Global stability of enzymatic chain of full reversible Michaelis-Menten reactions. *Acta Biotheoretica*, 61(3):425–436, 2013.

[3] M. Chaves, E. Farcot, and J.-L. Gouzé. Probabilistic approach for predicting periodic orbits in piecewise affine differential models. *Bulletin of Mathematical Biology*, 75(6):967–987, 2013.

[4] J. Rault, E. Benoît, and J.-L. Gouzé. Stabilizing effect of cannibalism in a two stages population model. *Acta Biotheoretica*, 61:119–139, 2013.

[5] G. Robledo, F. Grognard, and J.-L. Gouzé. Global stability for a model of competition in the chemostat with microbial inputs. *Nonlinear Analysis: Real World Applications*, 13(2):582–598, 2012.

[6] I. Ndiaye and J.-L. Gouzé. Global stability of reversible enzymatic metabolic chains. *Acta Biotheoretica*, 61(1):41–57, 2012.

[7] Abou-Jaoudé, W., Chaves, M., and Gouzé, J. L. (2011). A theoretical exploration of birhythmicity in the p53-mdm2 network. *PLoS ONE*, 6(2):e17075.

[8] Chaves, M. and Gouzé, J. (2011). Exact control of genetic networks in a qualitative framework: the bistable switch example. *Automatica*, 47:1105–1112.

[9] Chaves, M., Tournier, L., and Gouzé, J. L. (2010b). Comparing Boolean and piecewise affine differential models for genetic networks. *Acta Biotheoretica*, 58(2):217–232.

[10] Farcot, E. and Gouzé, J.-L. (2010a). Limit cycles in piecewise-affine gene network models with multiple interaction loops. *International Journal of Systems Science*, 41(1):119–130.

[11] Ndiaye, I., Chaves, M., and Gouzé, J. L. (2010). Oscillations induced by different timescales in signal modules regulated by slowly evolving protein-protein interactions. *IET Systems Biology*, 4(4):263–276.

[12] Serhani, M., Gouzé, J.-L., and Raissi, N. (2010). Dynamical study and robustness for a nonlinear wastewater treatment model. *Nonlinear Analysis: Real World Applications*, 12:487–500.

[13] E. Farcot and J.-L. Gouzé. Periodic solutions of piecewise affine gene network models with non uniform decay rates: The case of a negative feedback loop. *Acta Biotheoretica*, 57(4):429–455, 2009.

[14] J.-L. Gouzé and V. Lemesle. Two simple growth models in the chemostat. *ARIMA*, 2008.

[15] M. Moisan, O. Bernard, and J.-L. Gouzé. Near optimal interval observers bundle for uncertain bioreactors. *Automatica*, 45:291–295, 2009.

[16] V. Lemesle and J.-L. Gouzé. A simple unforced oscillatory growth model in the chemostat. *Bulletin of Mathematical Biology*, 70:344–357, 2008.

[17] L. Mailleret, J.-L. Gouzé, and O. Bernard. Global stabilization of a class of partially known positive systems. *Automatica*, 44:2128–2134, 2008.

[18] G. Batt, H. de Jong, J. Geiselmann, J.-L. Gouzé, M. Page, D. Ropers, T. Sari, and D. Schneider. Analyse qualitative de la dynamique de réseaux de régulation génique par des modèles linéaires par morceaux. *TSI Technique et Science Informatiques*, 26:11–46, 2007.

[19] Casey, R., de Jong, H., and Gouzé, J.-L. (2006). Piecewise-linear models of genetic regulatory networks: Equilibria and their stability. *Journal of Mathematical Biology*, 52:27-56.

[20] Gouzé, J.-L. and Robledo, G. (2005a). Feedback control for nonmonotone competition models in the chemostat. *Nonlinear Analysis: Real World Applications*, 6:671–690.

[21] J.-L. Gouzé and G. Robledo. Robust control for an uncertain chemostat model. *Internat. J. Robust Nonlinear Control*, 16(3):133–155, 2006.

[22] Lemesle, V. and Gouzé, J. L. (2005a). A biochemically based structured model of phytoplankton growth in the chemostat. *Ecological Complexity*, 2:21–33.

[23] Lemesle, V. and Gouzé, J. L. (2005b). An hybrid bounded error observer for uncertain bioreactor models. *Bioprocess and Biosystems Engineering*, 27:311–318.

[24] Mailleret, L., Gouzé, J.-L., and Bernard, O. (2005). Nonlinear control for algae growth models in the chemostat. *Bioprocess and Biosystem Engineering*, 27:319–327.

[25] H. de Jong, J.-L. Gouzé, C. Hernandez, M. Page, T. Sari, and H. Geiselmann (2004). Qualitative simulation of genetic regulatory networks using piecewise-linear models. *Bull. Math. Biol*, 66:301–340.

[26] O. Bernard and J.-L. Gouzé (2004). Closed loop observers bundle for uncertain biotechnological models. *J. Process. Contr.*, 14:7:765–774.

[27] J.-L. Gouzé and T. Sari (2003). A class of piecewise linear differential equations arising in biological models. *Dynamical systems*, 17:299–316.

[28] Rapaport, A. and Gouzé, J.-L. (2003). Parallelotopic and practical observers for nonlinear uncertain systems. *Int. Journal. Control*, 76:237–251.

[29] Arino, J., Gouzé, J.-L., and Sciandra, A. (2002). A discrete, size-structured model of phytoplankton growth in the chemostat. Introduction of non constant cell division. *J. Math. Biol.*, 45:313–33.

[30] Arino, J. and Gouzé, J.-L. (2002). A size-structured, non conservative ODE model of the chemostat. *Mathematical Biosciences*, 177-178:127–145.

[31] Bernard, O. and Gouzé, J.-L. (2002). Global qualitative behavior of a class of nonlinear biological systems: application to the qualitative validation of phytoplankton growth models. *Artif. Intel.*, 136:29–59.

[32] Hadj-Sadok, M. Z. and Gouzé, J. L. (2001). Estimation of uncertain models of activated sludge process with interval observers. *Journal of Process Control*, 11(3):299–310.

[33] Karama, A., Bernard, O., Gouzé, J., Benhammou, A., and Dochain, D. (2001). Hybrid neural modelling of an anaerobic digester with respect to biological constraints. *Wat. Sci. Technol.*, 43(7):1–8.

[34] Touzeau, S. and Gouzé, J.-L. (2001). Regulation of a fishery: from a local optimal control problem to an "invariant domain" approach. *Natural Resource Modeling*, 14(2):311–333.

[35] Gouzé, J. L., Rapaport, A., and Hadj-Sadok, Z. (2000). Interval observers for uncertain biological systems. *Ecological modelling*, 133:45–56.

[36] Bernard, O. and Gouzé, J.-L. (1999). Nonlinear qualitative signal processing for biological systems: application to the algal growth in bioreactors. *Mathematical Biosciences*, 157:357–372.

[37] Touzeau, S. and Gouzé, J.-L. (1998). On the stock-recruitment relationships in fish population models. *Environmental modelling and assessment*, 3:87–93.

[38] Gouzé, J.-L. (1998). Positive and negative circuits in dynamical systems. *Journal Biol. Syst.*, 6(1):11–15.

## Book chapters

[1] F. Mairet and J.-L. Gouzé. Control of a Bioreactor with Quantized Measurements. In F. Fages and C. Piazza, editors, *Formal Methods in Macro-Biology*, volume 8738 of *Lecture Notes in Computer Science*, pages 47–62. Springer International Publishing, 2014.

[2] G. Bernot, J.-P. Comet, A. Richard, M. Chaves, J.-L. Gouzé, and F. Dayan. Modeling and analysis of gene regulatory networks. In F. Cazals and P. Kornprobst, editors, *Modeling in Computational Biology and Biomedicine*, pages 47–80. Springer, 2013.

[3] Gouzé, J. L. and Chaves, M. (2010). Piecewise affine models of regulatory genetic networks: review and probabilistic interpretation. In Lévine, J. and Müllhaupt, P., editors, *Advances in the Theory of Control, Signals and Systems, with Physical Modelling*, Lecture Notes in Control and Information Sciences, vol. 407. Springer.

[4] E. Benoit and J.-L. Gouzé. An algorithmic approach to orders of magnitude in a biochemical system. In R. Bru and S. Romero, editors, *International Symposium on Positive Systems: Theory and Applications (POSTA 2009)*, volume 389 of *Lecture Notes in Control and Information Sciences*, pages 233–241. Springer Verlag, 2009.

[5] F. Grognard, J.-L. Gouzé, and H. de Jong. Piecewise-linear models of genetic regulatory networks: theory and example. In I. Queinnec, S. Tarbouriech, G. Garcia, and S. Niculescu, editors, *Biology and control theory: current challenges*, Lecture Notes in Control and Information Sciences (LNCIS) 357, pages 137–159. Springer-Verlag, 2007.

[6] O. Bernard and J.-L. Gouzé. *Bioprocess Control*, chapter State estimation for bioprocesses, pages 79–114. Wiley, Hoboken, 2008.

[7] Batt, G., Casey, R., de Jong, H., Geiselmann, J., Gouzé, J.-L., Page, M., Ropers, D., Sari, T., and Schneider, D.. Qualitative analysis of the dynamics of genetic regulatory networks using piecewise-linear models. In Pecou, E., Martinez, S., and Maass, A., editors, *Mathematical and Computational Methods in Biology*. Editions Hermann, Paris. 2005

[8] Bernard, O. and Gouzé, J.-L. (2001). Estimation d'état, chapitre 4, pages 87–120. D. Dochain, éditeur, *Automatique des bioprocédés.* Hermès Science, Paris.

[9] Bernard, O. and Gouzé, J.-L. (2002). State estimation for bioprocesses. In A.Agrachev, editor, *Mathematical Control Theory*, pages 813–855, Trieste. ICTP.

## International conference proceedings, with review (2003 - 2014)

[1] I. Belgacem and J.-L. Gouzé. Mathematical study of the global dynamics of a concave gene expression model. In *22nd Mediterranean Conference of Control and Automation (MED)*, Palermo, Italy, June 2014.

[2] I. Belgacem, E. Grac, D. Ropers, and J.-L. Gouzé. A coupled transcription-translation mathematical model of RNA polymerase. In *21st International Symposium on Mathematical Theory of Networks and Systems*, Groningen, Netherlands, July 2014.

[3] I. Belgacem, E. Grac, D. Ropers, and J.-L. Gouzé. Stability analysis of a reduced transcription-translation model of RNA polymerase. In *Proceedings of the 53rd IEEE Conference on Decision and Control*, Los Angeles, CA, United States, Dec. 2014.

[4] I. Belgacem and J.-L. Gouzé. Analysis and reduction of transcription translation coupled models for gene expression. In *CAB (Computer applied to Biotechnology)*, Mumbai, Inde, 2013. IFAC.

[5] I. Belgacem and J.-L. Gouzé. Stability analysis and reduction of gene transcription models. In *52nd IEEE Conference on Decision and Control (CDC'13)*, Florence, Italie, 2013.

[6] A. Carta, M. Chaves, and J.-L. Gouzé. A class of Switched Piecewise Quadratic Systems for coupling gene expression with growth rate in bacteria. In S. Tarbouriech and M. Krstic, editors, *9th IFAC Symposium Nonlinear Control Systems (NOLCOS'13)*, volume 9 Part 1, pages 271–276, Toulouse, France, 2013. IFAC.

[7] F. Grognard, J. Rault, and J.-L. Gouzé. Positive control for global stabilization of predator-prey systems. In S. Tarbouriech and M. Krstic, editors, *9th IFAC Symposium Nonlinear Control Systems (NOLCOS'13)*, volume 9 Part 1, pages 265–270, Toulouse, France, 2013. IFAC.

[8] X.-D. Li, M. Chaves, and J.-L. Gouzé. Robust estimation for a hybrid model of genetic network. In *20th Mediterranean Conference on Control and Automation*, pages 145–150, Barcelona, Espagne, July 2012.

[9] C. Breindl, M. Chaves, J.-L. Gouzé, and F. Allgöwer. Structure estimation for unate Boolean models of gene regulation networks. In *Proc. 16th IFAC Symposium on System Identification*, pages 1725–1730, Brussels, Belgique, 2012.

[10] A. Carta, M. Chaves, and J.-L. Gouzé. A simple model to control growth rate of synthetic E. coli during the exponential phase: model analysis and parameter estimation. In D. Gilbert and M. Heiner, editors, *10th Conference on Computational Methods in Systems Biology*, volume 7605 of *Lecture Notes in Computer Science*, pages 107–126, London, Royaume-Uni, 2012. Springer.

[11] I. Belgacem and J.-L. Gouzé. Global Stability of Full Open Reversible Michaelis-Menten Reactions. In *8th IFAC Symposium Advanced Control of Chemical Processes (ADCHEM)*, volume 8, pages 591–596, Furama Riverfront, Singapour, 2012.

[12] W. Abou-Jaoudé, M. Chaves, and J.-L. Gouzé. Mechanisms for coexistence of two limit cycles in a biochemical model. In *IFAC World Congress*, Milan, Italie, 2011. IFAC.

[13] X.-D. Li, J.-L. Gouzé, and M. Chaves. An observer for a piecewise affine genetic network model with Boolean observations. In *IEEE Conference of Decision and Control*, pages 4389 – 4394, Orlando, États-Unis, Dec. 2011.

[14] Abou-Jaoudé, W., Chaves, M., and Gouzé, J. L. (2011). Mechanisms for coexistence of two limit cycles in a biochemical model. In *Proc.* $18^{th}$ *IFAC World Congress*, Milan, Italy.

[15] Chaves, M., Farcot, E., and Gouzé, J. L. (2010a). Transition probabilities for piecewise affine models of genetic networks. In *Proc. Int. Symp. Mathematical Theory of Networks and Systems (MTNS'10)*, Budapest, Hungary.

[16] Chaves, M. and Gouzé, J. L. (2010). Qualitative control of genetic networks: the bistable switch example. In *Proc. IFAC Nonlinear Control Systems Symp. (NOLCOS'10)*, Bologna, Italy.

[17] Farcot, E. and Gouzé, J. L. (2010b). Qualitative control of periodic solutions in piecewise affine models of genetic networks. In *Proc. IFAC Nonlinear Control Systems Symp. (NOLCOS'10)*, Bologna, Italy.

[18] I. Ndiaye, M. Chaves, and J.-L. Gouzé. Study and parameter identification of a model coupling cell signaling and gene expression. In *Proc. 16th Mediterranean Conf. Control and Automation (MED'08)*, Ajaccio, France, 2008.

[19] D. Ropers, H. de Jong, J.-L. Gouzé, M. Page, D. Schneider, and J. Geiselmann. Piecewise-linear models of genetic regulatory networks: Analysis of the carbon starvation response in *escherichia coli*. In A. Deutsch, L. Brusch, H. Byrne, G. de Vries, and H.-P. Herzel, editors, *Mathematical Modeling of Biological Systems, Volume I (Proceedings of the European Conference on Mathematical and Theoretical Biology (ECMTB) 2005).*, pages 85–98. Birkhaüser, Boston, 2007.

[20] L. Tournier and J.-L. Gouzé. Hierarchical analysis of piecewise affine models of gene regulatory networks. *Theory in Biosciences*, 127:125–134, 2008.

[21] L. Tournier and J.-L. Gouzé. Qualitative stability patterns for lotka-volterra systems on rectangles. In M. Egerstedt and B. Mishra, editors, *Hybrid Systems, Computation and Control HSCC 08*, Lecture Notes in Computer Sciences (LNCS) 4981, pages 662–665. Saint-Louis, USA, Springer-Verlag, 2008.

[22] M. Moisan, O. Bernard, and J.-L. Gouzé. High/low gain bundle of observers: application to the input estimation of a bioreactor model. In *Proceedings of the IFAC conference*. Seoul, Korea, 2008.

[23] R. Casey, H. de Jong, and J.-L. Gouzé. Stability of equilibria for hybrid models of genetic regulatory networks. In F. Lamnabhi-Lagarrigue, A. Loria, E. Panteley, and S. Laghrouche, editors, *Taming Heterogeneity and Complexity of Embedded Control*, ISTE. Hermes Science, Paris, 2007.

[24] M. Moisan, O. Bernard, and J.-L. Gouzé. Near optimal interval observers bundle for uncertain bioreactors. In *Proceedings of 9th European Control Conference*. Kos, Greece, 2007.

[25] M. Moisan, O. Bernard, and J.-L. Gouzé. Robust estimation using direct–reverse time interval observers: Application to an industrial bioreactor. In *Proceedings of the STIC et Environnement conference*. Lyon, France, 2007.

[26] E. Farcot and J.L. Gouzé. A mathematical framework for the control of piecewise affine models of gene networks. In *International Conference on Molecular Systems Biology*, Munich, Aug. 2006.

[27] E. Farcot and J.L. Gouzé. Piecewise constant feedback control of piecewise affine gene network models. In A. Bemporad, A. Bicchi, and G. Buttazzo, editors, *Hybrid Systems: Computation and Control HSCC 07*, Lecture Notes in Computer Sciences (LNCS) 4416, pages 688–692. Pisa, Italy, Springer-Verlag, 2007.

[28] Casey, R., de Jong, H., and Gouzé, J.-L. (2005b). Stability of equilibria for piecewise-linear models of genetic regulatory networks. In *Proceedings of the CDC ECC conference*. Sévilla, Spain.

[29] J.-L. Gouzé, M. Moisan, and O. Bernard. A simple improvement of interval asymptotic observers for biotechnological processes. In *Proceedings of the ROCOND 2006 conference*. Toulouse, France, 2006.

[30] J.-L. Gouzé, M. Moisan, and O. Bernard. Simple interval observers for biotechnological processes. In *Proceedings of the ISCCSP 2006 conference*. Marrakech, Morocco, 2006.

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## Some French acronyms

ADEME Agence de l'Environnement et de la maitrise de l'Energie
CIMPA Centre International de Mathématiques Pures et Appliquées
CNRS Centre National de la Recherche Scientifique
ENS Ecole Normale Supérieure
ERCIM European Research Consortium for Informatics and Mathematics
I3S Laboratoire Informatique, Signaux et Systèmes de Sophia-Antipolis
INRA Institut National de la Recherche Agronomique
IST Information Society Technologies
LOV Laboratoire d'Océanographie de Villefranche-sur-Mer
STIC Sciences et Technologies de l'Information et de la Communication
UMR Unité Mixte de Recherche
UNSA Université de Nice Sophia Antipolis