Guillaume Mercère
Associate Professor (Maître de conférences HdR)
at the University of Poitiers (France)

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Administrative information

Personal data
Born in 1977 in Cambrai, France
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Professional data
✉ Université de Poitiers, LIAS
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Professional career

2005- :	Associate Professor at Poitiers University, Poitiers Graduate School of Engineering ("École Nationale Supérieure d'Ingénieurs de Poitiers" (ENSIP) in French), Poitiers, France Member of the Automatic Control and Industrial Data Processing Laboratory ("Laboratoire d'Informatique et d'Automatique pour les Systèmes" (LIAS) in French), Poiters, France
2004-2005:	Permanent contract as a Lecturer-Researcher at the Engineering School of Pas-de-Calais, Saint Omer, France
2001-2004:	Fixed term contract as a Lecturer-PhD student at the Engineering School of Pas-de-Calais, Saint Omer, France

Education

11/2012:	Accreditation to supervise research ("Habilitation à diriger des Recherches"), Poitiers University, Poitiers, France Title: Identification of Multi-Input Multi-Output State-Space Systems: from Linear Time-Invariant Models to Linear Parameter-Varying Ones
2001-2004:	Ph.D. in Automatic Control, Lille Sciences and Technology University, Lille, France Title: Recursive System Identification: a Subspace-based Approach
2000-2001:	M.S. in Electronics, Automatic Control and Image Processing, Caen University, Caen, France
1998-2001:	M.S. in Electrical Engineering, Caen Graduate School of Engineering (" École Nationale Supérieure d'Ingénieurs de Caen" in French), Caen, France

Research

Research topics :	model learning, system identification, estimation theory, state space model, gray box model, black box model, linear parameter varying model, realization theory, subspace-based methods, recursive algorithms, Kalman filtering, model reduction
Applications :	vehicle and tire dynamics, fluid mechanics and heat transfer, flexible and cable driven manipulators, aeronautics, image processing

Funding summary

- Model learning with uncertainty certificates. Application to data-based tire dynamics
  - Date : September 2023 to December 2027
  - Administrated by : Poitiers University
  - Partners : Michelin
  - Grant : PhD grant + 100000€

- Estimation of physical parameters and signals for automated driving
  - Date : January 2022 to December 2025
  - Administrated by : Poitiers University
  - Partners : Michelin
  - Grant : PhD grant + 90000€

- Calendaring process modeling and control
  - Date : January 2022 to December 2024
  - Administrated by : Poitiers University
  - Partners : Michelin
  - Grant : PhD grant + 90000€

- Models, Inference and Synthesis for Texture In Color
  - Date : October 2019 to August 2025
  - Administrated by : Agence Nationale de Recherche (ANR MISTIC ANR-19-CE40-0005)
  - Partners : LMA (Poitiers, FR), Institut XLIM (Poitiers, FR), MAP5 (Paris, FR), Telecom Paris (Paris, FR)
  - Grant : 455000€

- Estimation for vehicle tire-road interactions towards automated driving
  - Date : January 2019 to December 2022
  - Administrated by : Poitiers University
  - Partners : Michelin
  - Grant : PhD grant + 90000€

- Physically-based data-driven modeling for tire parameters estimation
  - Date : June 2018 to December 2019
  - Administrated by : Poitiers University
  - Partners : Michelin
  - Grant : Post-doc. grant + 30000€

- Detection and tracking of solid tumors
  - Date : January 2019 to December 2019
  - Administrated by : Ligue contre le cancer
  - Partners : IC2MP (Poitiers, FR), Poiters hospital (Poitiers, FR)
  - Grant : 200000€

- Stochastic data-driven modeling for texture generation
  - Date : January 2017 to December 2018
  - Administrated by : Poitiers University
  - Partners : Institut XLIM (Poitiers, FR), LMA (Poitiers, FR)
  - Grant : 6000€

- GEVAPORE
  - Date : October 2016 to June 2017
  - Administrated by : Challenge General Electric
  - Partners : LAMIH (Valenciennes, FR), Faculty of Industrial Engineering, Mechanical Engineering and Computer Science of Iceland University (Reykjavik, IS), General Electric (Alberta, Canada)
  - Grant : 70000€

- 2D model identification for image processing
  - Date : October 2014 to December 2016
  - Administrated by : Poitiers University
  - Partners : Institut XLIM (Poitiers, FR)
  - Grant : 12500€

- Structured system identification
  - Date : January 2012 to December 2013
  - Administrated by : Projet Fédération MIRES
  - Partners : Institut XLIM (Limoges, FR)
  - Grant : 3200€

- Fluttering detection from short data sets
  - Date : September 2010 to December 2013
  - Administrated by : Poitiers University
  - Partners : ONERA and AIRBUS
  - Grant : PhD grant + 10000€

- LPV identification and control of cable robots
  - Date : January 2010 to January 2012
  - Administrated by : Projets Exploratoires Pluridisciplinaires (CNRS)
  - Partners : ICUBE (Strasbourg, FR), Institut XLIM (Limoges, FR)
  - Grant : 30000€

- Detection and monitoring of fouling in heat exchangers
  - Date : September 2007 to September 2010
  - Administrated by : Programme Interdisciplinaire Energie (CNRS)
  - Partners : Laboratoire d'Automatique, de Mécanique et d'Informatique industrielles et Humaines (Valenciennes, FR), Faculty of Industrial Engineering, Mechanical Engineering and Computer Science of Iceland University (Reykjavik, IS)
  - Grant : 150000€

- Identification of a mini-uav
  - Date : January 2008 to January 2009
  - Administrated by : Action incitative de l'Université de Poitiers
  - Partners : PPRIME (Poitiers, FR)
  - Grant : 10000€

PhD projects

Defended under my (co-)supervision

- Laurent Bako, PhD thesis defended on 21 November 2008. Title: contribution to the identification of dynamical hybrid systems (in French)

- Wafah Farah, PhD thesis defended on 28 February 2011. Title: contribution to the identification and uncertainty quantification of mutlivariable systems (in French)

- Jérémy Vayssettes, PhD thesis defended on 14 November 2013. Title: Modal analysis of multivariable systems from short duration tests performed in operational conditions (in French)
- Daniel Vizer, PhD thesis defended on 10 December 2015. Title: application of the $\mathcal{H}_\infty$-norm for the identification of linear time-invariant and linear parameter-varying models
- Mohamed Farah, PhD thesis defended on 08 December 2016. Title: identification of systems governed by partial differential equations. Application to heat exchangers (in French)
- Ziad Alkhoury, PhD thesis defended on 09 November 2017. Title: minimality, input-output equivalence and identifiability of LPV systems in state space and linear fractional representations
- Mohamed Kaseb, PhD thesis defended on 14 December 2021. Title: parametric and stochastic characterization of color textures
- Vincent Mussot, PhD thesis defended on 2 March 2022. Title: tire friction potential estimation combining Kalman filtering and Monte Carlo Markov Chain model
- Bassem Boukhebouz, PhD thesis defended on 24 March 2023. Title: identification of flexible transmission systems for robotic co-manipulation

Ongoing (co-)supervised PhD thesis

- Taleb Bou Hamdan. Title: calendaring process modeling and control
- Mohamed Elsherbiny. Title: estimation of physical parameters and signals for automated driving
- Hugo Koide. Title: model learning with uncertainty certificates. Application to data-based tire dynamics

Defense jury member

- S.-E. Chouaba, PhD thesis defended on 17 September 2012. Title: contribution à l'estimation de modèles linéaires à paramètres variants à temps continu. Application à la modélisation des échangeurs de chaleur, Université de Poitiers, Poitiers, France
- M. Bergamasco, PhD thesis defended on 02 February 2013. Title: continuous time model identification with applications to rotorcraft dynamics, Politecnico de Milano, Milan, Italy
- I. Ben Abbes, PhD thesis defended on 28 June 2013. Title: développement d'un nouveau modèle dédié à la commande du métabolisme glucidique appliqué aux patients diabétiques de type 1, Supelec, Rennes, France
- J.-B. Tylcz, PhD thesis defended on 04 December 2013. Title: Identification et contrôle de systèmes biologiques : application à la thérapie photodynamique, Université de Lorraine, Nancy, France
- S. Mechhoud, PhD thesis defended on 17 December 2013. Title: Estimation de la diffusion thermique et du terme source du modèle de transport de la chaleur dans les plasmas de tokamaks, Université de Grenoble, Grenoble, France
- X. Bombois, HdR defended on 21 January 2014. Title: Travaux sur l'identification pour la commande et la synthèse optimale de l'expérience d'identification, Université de Lyon, Lyon, France
- A. Jhinaoui, PhD thesis defended on 28 May 2014. Title: Subspace-based identification and vibration monitoring algorithms for rotating systems, Université de Rennes, Rennes, France
- P. Mellinger, PhD thesis defended on 16 December 2014. Title: Estimation d'incertitude d'identification modale avec et sans entrée connues : theorie, validation et application, Université de Rennes, Rennes, France
- M. Albisser, PhD thesis defended on 10 July 2015. Title: Identification of aerodynamic coefficients from free flight data, Université de Lorraine, Nancy, France

- M. Potters, PhD thesis defended on 28 June 2016. Title: Experiment design for identification of structured linear systems, TU Delft, Delft, The Netherlands
- C. Corbier, HdR defended on 24 November 2016. Title: Estimation de modèles par fonctions robustes mélangées à seuils bas : application aux signaux biomécaniques et aux systèmes vibratoires, Université de Saint Etienne, Roanne, France
- A. Simon, PhD thesis defended on 02 December 2016. Title: Etude de méthodes expérimentales d'identification et validation de modèles de simulation de fonctions de transfert de systèmes cavitants et de dispositifs amortisseurs POGO, Communauté Unisersité Grenoble Alpes, Grenoble, France
- Y. Bhujwalla, PhD thesis defended on 05 December 2017. Title: Nonlinear system identification with kernels: applications of derivatives in Reproducing Kernel Hilbert Spaces, Université de Lorraine, Nancy, France
- L. Batista, PhD thesis defended on 06 December 2017. Title: Identification de systèmes dynamiques linéaires à effets mixtes - applications aux dynamiques de populations cellulaires, Université de Lorraine, Nancy, France
- P. Cox, PhD thesis defended on 20 March 2018. Title: Towards efficient identification of Linear Parameter-Varying state-space models, TU Eindhoven, Eindhoven, The Netherlands
- N. Abroug, PhD thesis defended on 17 September 2018. Title: Commande robuste multivariables des systèmes de comanipulation, Université de Strasbourg, France
- R. Voorhoeve, PhD thesis defended on 22 October 2018. Title: Identification for advanced motion control: numerically reliable algorithms for complex systems, TU Eindhoven, Eindhoven, The Netherlands
- M. Abuabiah, PhD thesis defended on 25 June 2019. Title: A set membership approach to direct data driven control design, Politecnico di Torino, Turin, Italy
- D. Peumans, PhD thesis defended on 26 May 2020 (private defense on 24 April 2020). Title: BLA-based analysis and design of VCO-based Sigma-Delta modulators, VUB, Brussels, Belgium
- K. Colin, PhD thesis defended on 17 September 2020. Title: Data informativity for the prediction error identification of MIMO systems. Identification of a MEMs gyroscope, Université de Lyon, Lyon, France
- G. Quintana Carapia, PhD thesis defended on 21 September 2020 (private defense on 15 May 2020). Title: Statistical analysis and experimental validation of data-driven dynamic measurement methods, VUB, Brussels, Belgium
- Z. Zhao, PhD thesis defended on 10 December 2020. Title: Extraction de connaissances de données macroéconomiques, d'images et de données non fiables, Université Grenoble Alpes, Grenoble, France
- F. Morelli, PhD thesis defended on 27 January 2021. Title: Optimal identification experiment design: contributions to its robustification and to its use for dynamic network identification. Resonance Frequency Tracking, Université de Lyon, Lyon, France
- R. Ouvrard, HdR defended on 23 March 2022. Title: Moments Partiels Réinitialisés. Applications à la modélisation des dynamiques de population, Université de Poitiers, Poitiers, France
- T. Dairay, HdR defended on 21 November 2022. Title: De la simulation directe des écoulements turbulents à la réduction de modèles et à l'apprentissage pour l'industrie, CNAM, Paris, France
- V. Guibert, PhD thesis defended on 6 Jult 2023. Title: Hybrid polynomial dynamics modelling for the control of a fixed wing Unmanned Aerial Vehicle during stall, ISAE-SUPAERO, Toulouse, France

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International and national collaborations

- H. Biermé (Full Prof.), Laboratoire de Mathématiques et de Physique Théorique, Université de Tours (Tours, France)
- P. Carré (Full Prof.), Institut XLIM, Université de Poitiers (Poitiers, France)
- O. Prot (Associate Prof.), Institut XLIM, Université de Limoges (Limoges, France)
- E. Laroche (Full Prof.), Laboratoire des Sciences de l'Image, de l'Informatique et de la Télédétection, Université de Strasbourg (Strasbourg, France)
- X. Bombois (CNRS Research Dir.) and L. Bako (Associate Prof.), Laboratoire Ampère, Ecole Centrale Lyon (Lyon, France)
- M. Petreczky (CNRS Researcher), Centre de Recherche en Informatique, Signal et Automatique de Lille (Lille, France),
- S. Lalot (Full Prof.), Laboratoire de Mécanique et d'Energétique, Université de Valenciennes et du Hainaut Cambrésis (Valenciennes, France)
- J. Ramos (Associate Prof.), Nova Southeastern University, Farquhar College of Arts and Sciences, Division Mathematics, Science and Technology (Fort Lauderdale, FL, USA)
- M. Lovera (Full Prof.), Dipartimento di Scienze e Tecnologie Aerospaziali, Politecnico de Milano (Milan, Italy)
- H. Pálsson (Associate Prof.), Ó. P. Pálsson (Full Professor) and Anna Soffía Hauksdóttir, University of Iceland (Reykjavik, Iceland)
- I. Markovsky (Associate Prof.), Vrieje Universiteit Brussel (Brussel, Belgium)

Correlated activities

- IEEE Senior Member since January 2024
- Chair of the IFAC Technical Committee 1.1. Modelling, Identification and Signal Processing (2023 - 2026)
- Chair of the MIRES Technical Committee 4. Big Data and Modeling (2022-2024)
- Member of the Wiley International Journal of Adaptive Control and Signal Processing Editorial Board (April 2021 - April 2022)
- Member of the IEEE Control System Society Conference Editorial Board (Associate Editor for ACC and CDC)
- Chair of the IEEE Control System Society Technical Committee on System Identification and Adaptive Control (2016 - 2019)
- Appointed member of the French National Universities Council (CNU 61) in 2019 for one year
- Member of the IEEE Control System Society Technical Committee on System Identification and Adaptive Control
- Member of the IFAC Technical Committee on Modeling, Identification and Signal Processing
- Member of the European Research Network on System Identification
- Co-chair of the French Research Network on System Identification (2008 - 2014)
- Chair of the Identification team of the Automatic Control and Industrial Data Processing Laboratory ("Laboratoire d'Informatique et d'Automatique pour les Systèmes" (LIAS) in French)
- Member of the International Program Committee of the

  - Conférence Internationale Francophone d'Automatique 2010
  - Journées Doctorales et nationales MACS 2011, 2013, 2015
  - International Conference on Sciences and Techniques of Automatic Control and Computer Engineering 2017, 2018, 2019
  - IFAC Workshops on Linear Parameter Varying systems 2015, 2018, 2019
  - Journées d'Identification et de Modélisation Expérimentale 2020
  - Conference on Modelling, Identification and Control of Nonlinear Systems 2021
  - IFAC Symposium on System Identification 2021
  - IFAC Joint conferences on System Structure and Control (SSSC) , Time Delay Systems (TDS) and Linear Parameter Varying Systems (LPVS) 2022
  - IEEE Conference on Decision and Control 2022
  - IFAC Symposium on System Identification: learning models for decision and control 2024
- General vice chair of the Journées d'Identification et de Modélisation Expérimentale 2011 (Douai, France)
- Co-chair of the tutorials and workshops program committee of the IFAC World Congress 2017 (Toulouse, France)
- Local organizer of the European Research Network on System Identification Workshop 2017 (Lyon, France)
- Editor for IFAC Workshops on Linear Parameter Varying systems 2019
- Scientific program committee co-chair of the European Research Network on System Identification Workshop 2021 (Rennes, France)
- In charge of the International Relations Department, Poitiers Graduate School of Engineering, Poitiers, France (2023 -)
- In charge of the Electrical Energy Optimization and Control Department, Poitiers Graduate School of Engineering, Poitiers, France (2010 - 2014)

Teaching

1st year eng. school (L3):	signal processing
2nd year eng. school (M1):	systems and control, time series analysis
3rd year eng. school (M2):	advanced control theory (LQG, MPC), Kalman filtering, model learning

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Publications

Books and book chapters (6)

[1] G. Mercère. *Data Driven Model Learning for Engineers with Applications to Univariate Time Series*. Springer, 2023.

[2] D. Vizer, G. Mercère, E. Laroche, and O. Prot. *Control-oriented modelling and identification: theory and practice*, chapter LPV modeling and identification of a 2-DOF flexible robotic arm from local experiments using an H_∞-based glocal approach, pages 365–385. The Institution of Engineering and Technology, 2015.

[3] D. Vizer, G. Mercère, E. Laroche, and O. Prot. *Control-oriented modelling and identification: theory and practice*, chapter Linear fractional LPV model identification from local experiments using an H_∞-based glocal approach, pages 189–213. The Institution of Engineering and Technology, 2015.

[4] H. Halalchi, L. Cuvillon, G. Mercère, and E. Laroche. *Flexible robotics: applications to multiscale manipulations*, chapter Robust control of robotic manipulators with structural flexibilities, pages 349–379. Wiley, 2013. Available in French in "Robotique flexible : Manipulation multi-échelle", Hermès Science.

[5] M. Gilson, L. Bako, F. Carrillo, S. Lecoeuche, and G. Mercère. *Identification des systèmes: nouveaux développements et applications*. Hermès Science, 2012. In French.

[6] W. Farah Ep Tebbeb, G. Mercère, and T. Poinot. *Quantification des incertitudes des systèmes multivariables*. Editions universitaires européennes, 2012. In French.

International journal papers (34)

[1] T. Bou Hamdan, P. Coirault, G. Mercère, and T. Dairay. Data enabled predictive control of lpv systems. *Control Engineering Practice*, 149, 2024.

[2] M. Petreczky, R. Toth, and G. Mercère. Minimal realizations of input output behaviors by lpv state-space representations with affine dependence. *IEEE Control Systems Letters*, 7:2952–2957, 2023.

[3] M. Petreczky, R. Toth, and G. Mercère. LPV-ARX representations of LPV state space models with affine dependence. *Systems and Control Letters*, 173, 2023.

[4] T. Bou Hamdan, G. Mercère, T. Dairay, R. Meunier, P. Tremblay, and P. Coirault. Tracking distributed parameters system dynamics with recursive dynamic mode decomposition with control. *SIAM Journal of Applied Dynamical Systems*, 22:37–74, 2023.

[5] V. Mussot, G. Mercère, T. Dairay, V. Arvis, and J. Vayssettes. Model learning of the tire road friction slip dependency under standard driving conditions. *Control Engineering Practice*, 121:1–28, 2022.

[6] A. Fazzi, B. Grossmann, G. Mercère, and I. Markovsky. MIMO system identification using common denominator and numerators with known degrees. *International Journal of Adaptive Control and Signal Processing*, 36:870–881, 2022.

[7] V. Mussot, G. Mercère, T. Dairay, V. Arvis, and J. Vayssettes. Noise covariance matrix estimation with subspace model identification for Kalman filtering. *International Journal of Adaptive Control and Signal Processing*, 35:591–611, 2021.

[8] O. Prot and G. Mercère. Combining linear algebra and numerical optimization for gray-box affine state-space model identification. *IEEE Transactions on Automatic Control*, 65:3272–3285, 2020.

[9] R. Ouvrard, G. Mercère, T.hierry Poinot, F. Jiguet, and L. Mouysset. Dynamic models for bird population - a parameter-varying partial differential equation identification approach. *Control Engineering Practice*, 91:1–13, 2019.

[10] M. Kaseb, G. Mercère, H. Biermé, F. Brémand, and P. Carré. Phase estimation of a 2d fringe pattern using a monogenic-based multiscale analysis. *Journal of the Optical Society of America A*, 36:143–153, 2019.

[11] M. Farah, G. Mercère, R. Ouvrard, and T. Poinot. Combining least-squares and gradient-based algorithms for the identification of a co-current flow heat exchanger. *International Journal of Control*, 92:191–203, 2019.

[12] J. Ramos and G. Mercère. A stochastic subspace system identification algorithm for state space systems in the general 2-D Roesser model form. *International Journal of Control*, 91:2743–2771, 2018.

[13] D. Ghosh, X. Bombois, J. Huillery, G. Scorletti, and G. Mercère. Optimal identification experiment design for LPV systems using the local approach. *Automatica*, 87:258–266, 2018.

[14] J. Ramos and G. Mercère. Image modeling based on a 2-D stochastic subspace system identification algorithm. *Multidimensional Systems and Signal Processing*, 28:1133–1165, 2017.

[15] M. Petreczky, R. Tóth, and G. Mercère. Realization theory for LPV state-space representations with affine dependence. *IEEE Transactions on Automatic Control*, 62:4667–4674, 2017.

[16] I. Markovsky and G. Mercère. Subspace identification with constraints on the impulse response. *International Journal of Control*, 90:1728–1735, 2017.

[17] Z. Alkhoury, M. Petreczky, and G. Mercère. Identifiability of affine linear parameter-varying models. *Automatica*, 80:62–74, 2017.

[18] A. Alenany, G. Mercère, and J. Ramos. Subspace identification of 2-D CRSD Roesser models with deterministic-stochastic inputs: a state computation approach. *IEEE Transactions on Control Systems Technology*, 25:1108–1115, 2017.

[19] D. Vizer, G. Mercère, O. Prot, and E. Laroche. H_∞-norm-based optimization for the identification of gray-box LTI state-space model parameters. *Systems and Control Letters*, 92:34–41, 2016.

[20] J. Vayssettes, G. Mercère., and O. Prot. New developments for Matrix Fraction Descriptions: a fully-parametrised approach. *Automatica*, 66:15–24, 2016.

[21] J. Ramos and G. Mercère. Subspace algorithms for identifying separable-in-denominator 2-D systems with deterministic-stochastic inputs. *International Journal of Control*, 89:2584–2610, 2016.

[22] D. Vizer, G. Mercère, O. Prot, and E. Laroche. Combining analytic and experimental information for linear parameter-varying model identification: application to a flexible robotic manipulator. *Periodica Polytechnica Electrical Engineering and Computer Science*, 58:133–148, 2014.

[23] D. Vizer and G. Mercère. An H_∞-norm-based approach for operating point selection and LPV model identification from local experiments. *Periodica Polytechnica Electrical Engineering and Computer Science*, 58:121–131, 2014.

[24] J. Vayssettes, G. Mercère, P. Vacher, and R. De Callafon. Frequency-domain identification of aircraft structural modes from short-duration flight tests. *International Journal of Control*, 87:1352–1372, 2014.

[25] G. Mercère, O. Prot, and J. Ramos. Identification of parameterized gray-box state-space systems: from a black-box linear time-invariant representation to a structured one. *IEEE Transactions on Automatic Control*, 59:2873–2885, 2014.

[26] W. Farah, G. Mercère, and T. Poinot. Bounded-error uncertainty domain description for continuous-time state-space model. *IET Control Theory and Applications*, 6:261–273, 2012.

[27] G. Mercère, H. Palsson, and T. Poinot. Continuous-time linear parameter-varying identification of a cross flow heat exchanger: a local approach. *IEEE Transactions on Control Systems Technology*, 19:64–76, 2011.

[28] G. Mercère and L. Bako. Parameterization and identification of multivariable state-space systems: a canonical approach. *Automatica*, 47:1547–1555, 2011.

[29] L. Bako, G. Mercère, and S. Lecoeuche. On-line structured subspace identification with application to switched linear systems. *International Journal of Control*, 82:1496–1515, 2009.

[30] L. Bako, G. Mercère, S. Lecoeuche, and M. Lovera. Recursive subspace identification of Hammerstein models based on least squares support vector machines. *IET Control Theory and Applications*, 3:1209–1216, 2009.

[31] G. Mercère, L. Bako, and S. Lecoeuche. Propagator-based methods for recursive subspace model identification. *Signal Processing*, 88:468–491, 2008.

[32] G. Mercère and M. Lovera. Convergence analysis of instrumental variable recursive subspace identification algorithms. *Automatica*, 43:1377–1386, 2007.

[33] S. Lecoeuche, G. Mercère, and S. Lalot. Evaluating time dependent heat fluxes using artificial neural networks. *Inverse Problems in Science and Engineering*, 14:97–109, 2006.

[34] G. Mercère, S. Lecoeuche, and M. Lovera. Recursive subspace identification based on instrumental variable unconstrained quadratic optimization. *International Journal of Adaptive Control and Signal Processing*, 18:771–797, 2004.

National journal papers (2)

[1] G. Mercère, R. Ouvrard, M. Gilson, and H. Garnier. Identification de systèmes multivariables à temps continu par approche des sous-espaces. *European Journal of Automation*, 42:261–285, 2008. In French.

[2] G. Mercère, S. Lecoeuche, and C. Vasseur. Adaptation robuste de la méhode du propagateur à l'identification récursive des sous-espaces. *E-revue Sciences et Technologies de l'Automatique*, 2, 2005. In French.

Technical reports (5)

[1] J. A. Ramos and G. Mercère. Computation of the state bias and initial states for stochastic state space systems in the general 2-D roesser model form. Technical report, Poitiers University, Laboratoire d'Automatique et d'Informatique pour les Systèmes, 2018. Available on ArXiv.org, arXiv number: 1801.08409.

[2] G. Mercère. Prior knowledge and Markov parameters of linear time-invariant models. Technical report, Poitiers University, Laboratoire d'Automatique et d'Informatique pour les Systèmes, 2016. Available on ArXiv.org, arXiv number: 1606.08422.

[3] G. Mercère, O. Prot, and J. Ramos. Identification of parameterized gray-box state-space systems: from a black-box linear time-invariant representation to a structured one. Detailed derivation of the gradients involved in the cost functions. Technical report, Poitiers University, Laboratoire d'Automatique et d'Informatique pour les Systèmes, 2014. Available on ArXiv.org, arXiv number: 1406.0623.

[4] G. Mercère. Regression techniques for subspace-based black-box state-space system identification: an overview. Technical report, Poitiers University, Laboratoire d'Automatique et d'Informatique pour les Systèmes, 2013. Available on ArXiv.org, arXiv number: 1305.7121.

[5] G. Mercère. Identification of multi-input multi-output state-space systems: from linear time-invariant to linear parameter-varying models. Technical report, University of Poitiers, 2012. Available on zenodo.org, http://doi.org/10.5281/zenodo.4732315.

International conference papers (48)

[1] V. Breschi, T. Bou Hamdan, G. Mercère, and S. Formentin. Tuning of susbpace predictive controls. In *Proceedings of the IFAC Modeling, Estimation and Control Conference*, pages 103–108, Lake Tahoe, NV, USA, October 2023.

[2] B. Boukhebouz, G. Mercère, M. Grossard, X. Lamy, and E. Laroche. Shaping multisine excitation for closed loop identification of a flexible transmission. In *Proceedings of the IFAC Symposium on System Identification*, Padova, Italy (virtual), July 2021.

[3] B. Boukhebouz, G. Mercère, M. Grossard, X. Lamy, and E. Laroche. Identification of single flexible-joint robot dynamics: a nonparametric approach. In *Proceedings of the Mediterranean Conference on Control and Automation*, Saint Raphael, France, September 2020.

[4] D. C. Pham, G. Mercère, R. Ouvrard, and T. Poinot. Heat equation parameter estimation based on the POD-Galerkin approach. In *Proceedings of the IFAC Symposium on System Identification*, Stockholm, Sweden, July 2018.

[5] D. C. Pham, G. Mercère, R. Ouvrard, T. Poinot, and H. Pálsson. Fouling detection in a parallel flow heat exchanger via a Roesser model identification procedure. In *Proceedings of the IFAC World Congress*, Toulouse, France, July 2017.

[6] Z. Alkhoury, M. Petreczky, and G. Mercère. Comparing global input-output behavior of frozen-equivalent LPV state-space models. In *Proceedings of the IFAC World Congress*, Toulouse, France, July 2017.

[7] G. Mercère, I. Markovsky, and J. Ramos. Innovation-based subspace identification in open- and closed-loop. In *Proceedings of the Conference on Decision and Control*, Las Vegas, NV, USA, December 2016.

[8] Z. Alkhoury, M. Petreczky, and G. Mercère. Structural properties of affine LPV to LFR transformation: minimality, input-output behavior and identifiability. In *Proceedings of the Conference on Decision and Control*, Las Vegas, NV, USA, December 2016.

[9] D. Vizer, G. Mercère, E. Laroche, O. Prot, and B. Kiss. Comparison of a gradient-based algorithm and a proximity control algorithm for gray-box LTI model identification. In *Proceedings of the IEEE International Symposium on Computational Intelligence and Informatics*, Budapest, Hungary, November 2015.

[10] D. Vizer, G. Mercère, and E. Laroche. Gray-box LPV model identification of a 2-DoF surgical robotic manipulator by using an H_∞-norm-based local approach. In *Proceedings of the IFAC Workshop on Linear Parameter Varying Systems*, Grenoble, France, October 2015.

[11] E. Laroche, L. Cuvillon, D. Vizer, and G. Mercère. A benchmark on the identification of a flexible serial manipulator using a camera. In *Proceedings of the IFAC Symposium on System Identification*, Beijing, China, October 2015.

[12] J. Vayssettes, G. Mercère, Y. Bury, and V. Pommier-Budinger. Structured model identification algorithm based on constrained optimisation. In *Proceedings of the European Control Conference*, Linz, Austria, July 2015.

[13] M. Farah, R. Ouvrard, G. Mercère, T. Poinot, and J. Gabano. Reinitialized partial moments for the identification of the heat equation parameters. In *Proceedings of the European Control Conference*, Linz, Austria, July 2015.

[14] J. Vayssettes and G. Mercère. A new parametrisation of matrix fraction descriptions to improve gradient-based optimisation methods. In *Proceedings of the Conference on Decision and Control*, Los Angeles, CA, USA, December 2014.

[15] J. Vayssettes and G. Mercère. New developments for experimental modal analysis of aircraft structures. In *Proceedings of Analyse Vibratoire Expérimentale*, Blois, France, November 2014.

[16] J. Vayssettes, R. de Callafon, and G. Mercère. Filtered-covariance function-based subspace identification with bound effects integration. In *Proceedings of the IFAC World Congress*, Cape Town, South Africa, August 2014.

[17] D. Vizer and G. Mercère. H_∞-based LPV model identification from local experiments with a gap metric-based operating point selection. In *Proceedings of the European Control Conference*, Strasbourg, France, June 2014.

[18] M. Farah, G. Mercère, R. Ouvrard, T. Poinot, and J. Ramos. Identification of 2D Roesser models by using linear fractional representations. In *Proceedings of the European Control Conference*, Strasbourg, France, June 2014.

[19] D. Vizer, G. Mercère, O. Prot, E. Laroche, and M. Lovera. Linear fractional LPV model identification from local experiments: an H_∞-based optimization technique. In *Proceedings of the Conference on Decision and Control*, Florence, Italy, December 2013.

[20] D. Vizer, G. Mercère, O. Prot, and J. Ramos. A local approach framework for black-box and gray-box LPV system identification. In *Proceedings of the European Control Conference*, Zurich, Switzerland, July 2013.

[21] J. Ramos, G. Mercère, and O. Prot. Identifying second-order models of mechanical structures in physical coordinates: an orthogonal complement approach. In *Proceedings of the European Control Conference*, Zurich, Switzerland, July 2013.

[22] M. Petreczky and G. Mercère. Affine LPV systems: realization theory, input-output equations and relationship with linear switched systems. In *Proceedings of the Conference on Decision and Control*, Maui, Hawaii, USA, December 2012.

[23] J. Vayssettes, G. Mercère, and P. Vacher. An iterative algorithm for modal analysis based on structured matrix fractions. In *Proceedings of the IFAC Symposium on System Identification*, Brussels, Belgium, July 2012.

[24] O. Prot, G. Mercère, and J. Ramos. A null-space-based technique for the estimation of linear-time invariant structured state-space representations. In *Proceedings of the the IFAC Symposium on System Identification*, Brussels, Belgium, July 2012.

[25] G. Mercère, E. Laroche, and O. Prot. Analytical modelling and grey-box identification of a flexible arm using a linear parameter-varying model. In *Proceedings of the IFAC Symposium on System Identification*, Brussels, Belgium, July 2012.

[26] G. Mercère, E. Laroche, and M. Lovera. Identification of a flexible robot manipulator using a linear parameter-varying descriptor state-space structure. In *Proceedings of the Conference on Decision and Control and European Control Conference*, Orlando, Florida, USA, December 2011.

[27] O. Prot and G. Mercère. Initialization of gradient-based optimization algorithms for the identification of structured state-space models. In *Proceedings of the IFAC World Congress*, Milan, Italy, August 2011.

[28] W. Farah, G. Mercère, I. Houtzager, J. W. van Wingerden, and T. Poinot. Identification and uncertainty domain quantification: experimental validation on a "smart" wind turbine. In *Proceedings of the IFAC World Congress*, Milan, Italy, August 2011.

[29] W. Farah, G. Mercère, J. W. van Wingerden, and T. Poinot. Quantification of model uncertainty for a state-space system. In *Proceedings of the International Symposium on Mathematical Theory of Networks and Systems*, Budapest, Hungary, July 2010.

[30] W. Farah, G. Mercère, and T. Poinot. System identification and uncertainty domain determination: a subspace-based approach. In *Proceedings of the American Control Conference*, Baltimore, Maryland, USA, June 2010.

[31] L. Bako, R. Vidal, G. Mercère, and S. Lecoeuche. Identification of switched linear state-space models without dwell time. In *Proceedings of the IFAC Symposium on System Identification*, Saint Malo, France, July 2009.

[32] L. Bako, G. Mercère, and S. Lecoeuche. Identification of multivariable canonical state-space representations. In *Proceedings of the IFAC Symposium on System Identification*, Saint Malo, France, July 2009.

[33] G. Mercère, H. Palsson, and T. Poinot. Linear parameter-varying identification of a cross flow heat exchanger for fouling detection. In *Proceedings of the International Conference on Heat Exchanger Fouling and Cleaning*, Schladming, Austria, June 2009.

[34] L. Bako, G. Mercère, and S. Lecoeuche. A least squares approach to the subspace identification problem. In *Proceedings of the Conference on Decision and Control*, Cancun, Mexico, December 2008.

[35] S. Lalot and G. Mercère. Detection of fouling in heat exhanger using a recursive subspace identification algorithm. In *Proceedings of the International Symposium on Transport Phenomena*, Reykjavik, Iceland, August 2008.

[36] L. Bako, G. Mercère, S. Lecoeuche, and M. Lovera. Recursive subspace identification of Hammerstein models based on LS-SVM. In *Proceedings of the IFAC Workshop Adaptive and Learning Control and Signal Processing*, Saint Petersburg, Russia, August 2007.

[37] E. Tohme, R. Ouvrard, A. Abche, J. Trigeassou, T. Poinot, and G. Mercère. A methodology to enhance the convergence of output error identification algorithms. In *Proceedings of the European Control Conference*, Kos, Greece, July 2007.

[38] G. Mercère, R. Ouvrard, M. Gilson, and H. Garnier. Subspace-based methods for continuous-time model identification of MIMO systems from filtered sampled data. In *Proceedings of the European Control Conference*, Kos, Greece, July 2007.

[39] M. Lovera and G. Mercère. Identification for gain scheduling: a balanced subspace approach. In *Proceedings of the American Control Conference*, New York, USA, July 2007.

[40] M. Djamai, S. Bachir, C. Duvanaud, and G. Mercère. Nonlinear identification of continuous-time radio frequency power. In *Proceedings of the European Control Conference*, Kos, Greece, July 2007.

[41] L. Bako, G. Mercère, and S. Lecoeuche. Online structured identification of switching systems with possibly varying orders. In *Proceedings of the European Control Conference*, Kos, Greece, July 2007.

[42] K. De Cock, G. Mercère, and B. De Moor. Recursive subspace identification for in flight modal analysis of airplanes. In *Proceedings of the International Conference on Noise and Vibration Engineering*, Leuven, Belgium, September 2006.

[43] G. Mercère and M. Lovera. Convergence analysis of instrumental variable recursive subspace identification algorithms. In *Proceedings of the IFAC Symposium on System Identification*, Newcastle, Australia, March 2006.

[44] S. Lecoeuche, G. Mercère, and H. Amadou Boubacar. Modelling of non stationary systems based on dynamical decision space. In *Proceedings of the IFAC Symposium on System Identification*, Newcastle, Australia, March 2006.

[45] M. Gilson and G. Mercère. Subspace-based optimal IV method for closed loop system identification. In *Proceedings of the IFAC Symposium on System Identification*, Newcastle, Australia, March 2006.

[46] G. Mercère, S. Lecoeuche, and C. Vasseur. Sequential correlation based propagator algorithm for recursive subspace identification. In *Proceedings of the IFAC World Congress*, Praha, Czech Republic, July 2005.

[47] G. Mercère, S. Lecoeuche, and C. Vasseur. A new recursive method for subspace identification of noisy systems: EIVPM. In *Proceedings of the IFAC Symposium on System Identification*, Rotterdam, The Netherlands, August 2003.

[48] G. Mercère, S. Lecoeuche, and C. Vasseur. Output noise insensitive identification of systems: a new recursive state-space method. In *Proceedings of the Workshop on Physics in Signal and Image Processing*, Grenoble, France, January 2003.

National conference papers (14)

[1] J. Vayssettes, G. Mercère, and P. Vacher. Identification fréquentielle sur essais courts: intégration des conditions aux limites. In *Proceedings of the Conférence Internationale Francophone d'Automatique*, Grenoble, France, July 2012. In French.

[2] E. Laroche, G. Mercère, and H. Halalchi. Modélisation et identification LPV d'un manipulateur flexible. In *Proceedings of the Journées Identification et Modélisation Expérimentale*, Douai, France, April 2011. In French.

[3] W. Farah, G. Mercère, and T. Poinot. Uncertainty domain quantification for continuous-time state-space model. In *Proceedings of the Journées Identification et Modélisation Expérimentale*, Douai, France, April 2011. In French.

[4] S. Chouaba, A. Chamroo, G. Mercère, and T. Poinot. Modélisation MISO quasi LPV des échangeurs de chaleur. In *Proceedings of the Journées Identification et Modélisation Expérimentale*, Douai, France, April 2011. In French.

[5] S. Chouaba, A. Chamroo, G. Mercère, and T. Poinot. Application de deux approches d'interpolation pour la modélisation LPV d'un échangeur de chaleur. In *Proceedings of Conférence Internationale Francophone d'Automatique*, Nancy, France, June 2010. In French.

[6] W. Farah, G. Mercère, and T. Poinot. Estimation des paramètres d'un système multivariable à partir de modèles d'ordre réduit. In *Proceedings of the Journées doctorales MACS*, Angers, France, March 2009. In French.

[7] E. Tohme, G. Mercère, R. Ouvrard, T. Poinot, and A. Farcy. Modélisation expérimentale de la dynamique d'un mini drone par approche à erreur de sortie. In *Proceedings of the Conférence Internationale Francophone d'Automatique*, Bucarest, Roumania, September 2008. In French.

[8] L. Bako, G. Mercère, and S. Lecoeuche. Identification structurée de modèles d'état de systèmes multivariables. In *Proceedings of the Conférence Internationale Francophone d'Automatique*, Bucarest, Roumania, September 2008. In French.

[9] G. Mercère, R. Ouvrard, M. Gilson, and H. Garnier. Identification de systèmes multivariables à temps continu par approche des sous-espaces. In *Proceedings of the Journées Identification et Modélisation Expérimentale*, Poitiers, France, November 2006. In French.

[10] L. Bako, G. Mercère, and S. Lecoeuche. Identification en ligne de systèmes commutants à structure variable. In *Proceedings of the Journées Identification et Modélisation Expérimentale*, Poitiers, France, November 2006. In French.

[11] G. Mercère, H. Amadou Boubacar, L. Bako, and S. Lecoeuche. Suivi de systèmes non stationnaires basé sur une approche de reconnaissance de formes. In *Proceedings of the Conférence Internationale Francophone d'Automatique*, Bordeaux, France, June 2006. In French.

[12] G. Mercère, S. Lecoeuche, and C. Vasseur. Adaptation robuste de la méthode du propagateur à l'identification récursive des sous-espaces. In *Proceedings of the Conférence International Francophone d'Automatique*, Douz, Tunisia, November 2004. In French.

[13] S. Lecoeuche, C. Lurette, S. Lalot, and G. Mercère. Surveillance et diagnostic d'évolutions temporelles par classifieur autoadaptatif. In *Proceedings of the Congrès Francophone de Reconnaissance de Formes et Intelligence Artificielle*, Toulouse, France, January 2004. In French.

[14] G. Mercère and S. Lecoeuche. Identification en ligne de systèmes bruités : une nouvelle méthode récursive des sous-espaces. In *Proceedings of the Journées Doctorales d'Automatique*, Valenciennes, France, June 2003. In French.