

Curriculum Vitae



Laurent AUTRIQUE, PhD, Full Professor

LARIS, Polytech, Université d'Angers
62 avenue notre dame du lac, 49000 Angers, France
office : +33 (0) 244 687 518. Mobile +33 (0) 663 542 291
laurent.autrique@univ-angers.fr
ORCID 0000-0002-7611-4923
<http://perso-laris.univ-angers.fr/~autrique/>

Personal information: Born 12 November 1968, Married, 5 children, French citizen.

Higher Education: He received the Ph.D. degree from the University of Nantes (France) in 1995 and the Habilitation in 2005 from the University of Perpignan (France).

Positions: He is Full Professor of control system engineering with the University of Angers (Polytech') in France since 2008, and is currently affiliated with the research institute LARIS (Laboratoire Angevin de Recherche en Ingénierie des Systèmes – EA 7315) and with the graduate school Mathstic. He is the head of the “Control engineering and Computer Engineering” department of Polytech' Angers since Oct. 2016. From 2007 to 2008, he was Full professor of process control with the University Blaise Pascal of Clermont-Ferrand, France. From 1996 to 2007, he was Maître de Conférences (Associate Professor) with the University of Perpignan, France. He was affiliated with the “Process Modelling and Control” Team of PROMES research institute (UPR-CNRS-8521).

Research interests: His current research interests are focused on modeling, parametric identification and control applied to complex dynamic systems. His research activity is mainly dedicated to physical systems described by nonlinear partial differential equations. He also develops non-destructive techniques based on the analysis of periodic thermal excitations in order to detect defects in structural materials.

Selected publications in international peer-reviewed journals and conference proceedings

1. Perez L., Autrique L., *Parametric Identification for Students – Educational prototype based on the frequency approach*, IEEE Control Systems, Vol. 41, n°3, pp. 79-91, 2021.
2. Azar T., Perez L., Prieur C., Moulay E., Autrique L., *Quasi-Online Disturbance Rejection for Nonlinear Parabolic PDE using a Receding Time Horizon Control*, ECC 2021, Virtual conference, 29 juin - 2 juillet 2021.
3. Vergnaud A., Perez L., Autrique L., *Adaptive selection of relevant sensors in a network for unknown mobile heating flux estimation*, IEEE Sensors journal, vol. 20, n° 24, pp. 15133-15142, 2020
4. Orlov Y., Perez L., Gomez O., Autrique L., *ISS output feedback synthesis of disturbed reaction-diffusion processes using non-collocated sampled-in-space sensing and actuation*, Automatica, Vol. 122, 10.1016/j.automatica.2020.109257, 2020.
5. Azar T., Perez L., Prieur C., Moulay E., Autrique L., *Stabilization and disturbances rejection using internal actuator for the heat equation*, Control 2020, Bragança, Portugal, 1-3 July 2020.
6. Gillet M., Perez L., Autrique L., *A model based predictive tool for fire safety intumescent coatings design*, Fire Safety Journal, 110; 2019.

7. Orlov Y., Autrique L., Perez L., *ISS synthesis of parabolic systems with uncertain parameters using in-domain sensing and actuation*», 58th IEEE Conference on Decision and Control (CDC), Nice, 11-13 décembre 2019.
8. Tran T.P., Perez L., Autrique L., *Quasi-online method for the identification of heat flux densities and trajectories of two mobile heating sources*, 2017 Asian Control Conference, Australie, 17-20 dec. 2017.
9. Attar L., Perez L., Moulay E., Nouailletas R., Brémond S., Autrique L., *Software demonstration of quasi on line parametric identification related to thermal state in tokamak plasmas*, IFAC World Congress, Toulouse, 9-14 juillet 2017.
10. Vergnaud A., Perez L. Autrique L., *Quasi online parametric identification of moving heating devices in a 2D geometry*, International Journal of Thermal Sciences, Vol. 102, pp 47-61, 2016.
11. Beddiaf S., Autrique L., Perez L., Jolly J.C., *Heating source localization in a reduced time*, International Journal of Applied Mathematics and Computer Science, Vol. 26 n°3, pp 623-640, 2016.
12. Sonneck-Museux N., Scheer E., Perez L., Autrique L., Agay D., *Development of a Skin Burn Predictive Model adapted to Laser irradiation*, International Journal of Thermophysics, 37 n°12, pp 1-23, 2016.
13. Perez L., Lascoup B., Autrique L., *Defect localization in plane composite: a non intrusive automated procedure based on active thermography*, 18th International Conference on Composite Structures, Lisbonne Portugal, June 2015.
14. Vergnaud A., Tran T.P., Perez L., Lucidarme P., Autrique L., *Deployment strategies of mobile sensors for monitoring of mobile sources: method and prototype*, 10th National Conference Control Architectures of Robots 2015, Lyon, Juin 2015.
15. Attar L., Perez L., Nouailletas R., Moulay E., Autrique L., *Thermal diffusivity identification based on an iterative regularization method*, IEEE Conference on Decision and Control 2015, Osaka Japan, December 2015.
16. Lascoup B., Perez L., Autrique L., *Defect localization based on modulated photothermal local approach*, Composites Part B engineering, Vol. 65 n°1, pp 109-116, 2014.
17. Vergnaud A., Beaugrand G., Gaye O., Autrique L., *On-line identification of temperature-dependent thermal conductivity*, European Control Conference, Strasbourg, France, June 2014.
18. Vergnaud A., Perez L., Autrique L., *On-line monitoring of surfacic mobile heating sources*, International Conference on Inverse Problems in Engineering, Cracow, Poland, 12-15 May 2014.
19. Vergnaud A., Beaugrand G., Gaye O., Perez L., Lucidarme P., Autrique L., *Quasi on-line identification of temperature-dependent thermal conductivity*, European Control Conference 2014, Strasbourg, France, 24-27 June 2014.
20. Gillet M., Pechoux F., Perez L., Autrique L., *Modeling and experimental testing of intumescent coatings under high thermal flux for military applications*, 11th International Symposium on Fire Safety Science, Canterbury, Nouvelle-Zélande, février 2014.
21. Beddiaf S., Perez L., Autrique L., Jolly J.C., *Parametric identification of a heating mobile source in a three dimensional geometry*, Inverse Problems in Science and Engineering , Vol. 23, pp 93-111, 2014.
22. Beddiaf S., Perez L., Autrique L., Jolly J.C., *Simultaneous determination of time-varying strength and location of a heating source in a three-dimensional domain*, Inverse Problems in Science and Engineering, Vol. 22 n° 1-2, pp. 166-183, 2014.
23. Museux N., Perez L., Autrique L., Serra J.J., *Development of a skin laser burn predictive model*, Symposium on Temperature and thermal measurements in industry and science, Tempmeko, Madeira, Portugal, 14-18 Octobre 2013.
24. Vergnaud A., Lucidarme P., Autrique L., Perez L., *Adaptive deployment of a mobile sensors network to optimize the monitoring of a phenomenon governed by partial differential equations*, 10th International Conference on Informatics in Control, Automation and Robotics, Reykjavik, Iceland, July 2013.

25. Gaye O., Autrique L., Orlov Y., Moulay E., Brémond S., Nouailletas R., *H_∞ stabilization of the current profile in tokamak plasmas via LMI approach*, Automatica, Vol. 49, n°9, pp. 2795-2804, 2013.
26. Jolly J.C., Perez L., Autrique L., *An Inverse Geometry Problem for a 1-d Heat Equation: Advances with Complex temperatures*, Inverse Problems in Science and Engineering, Vol. 22 n° 1-2, pp. 63-83, 2013.
27. Lascoup B., Perez L., Autrique L., Crinière A., *On the feasibility of defect detection in composite material based on thermal periodic excitation*, Composites Part B: Engineering, Vol. 45, n°1, pp. 1023-1030, 2013.
28. Gaye O., Moulay E., Brémond S., Autrique L., Nouailletas R., Artaud J.F., Orlov Y., *Robust stabilization of the current profile in tokamak plasmas using sliding mode approach in infinite dimension*, Control engineering practice, Vol. 21, n°10, pp. 1350-1358, 2013.
29. Perez L., Autrique L., *Feasibility study and optimal design of an experimental bench for identification of liquids thermal diffusivity*, IEEE Transactions on Instrumentation and Measurement, Vol. 61, n°10, pp. 2739-2748, 2012.
30. Beddiaf S., Autrique L., Perez L., Jolly J.C., *Heating sources localization based on inverse heat conduction problem resolution*, 16th IFAC Symp. on System Identification, Sysid 2012, Brussels, juillet 2012.
31. Gillet M., Perez L., Autrique L., Serra J.J., *A model based predictive tool for fire safety intumescent coatings design*, 9th International Symposium on Special Topics in Chemical Propulsion, ISICP 2012, Québec, Canada, juillet 2012.
32. Museux N., Perez L., Autrique L., Serra J.J., *Thermal investigations of materials submitted to intense infrared radiations – skin burn evaluation*, 18th symposium on thermophysical properties, Colorado, USA, 24-29 June 2012.
33. Beddiaf S., Autrique L., Perez L., Jolly J.C., *Time-Dependent Heat Flux Identification: Application To A Three-Dimensional Inverse Heat Conduction Problem*, 4th International Conf. on Modelling, Identification and Control (ICMIC 2012), Wuhan, China, 24-26 Jun 2012.
34. Criniere A., Lascoup B., Perez L. Autrique L., *Defect detection based on thermal periodic excitation*, 15th European Conf; on Composite Materials, ECCM 2012, Venise, Italie, juin 2012.
35. Autrique L., Beddiaf S., Perez L., Jolly J.C., *Simultaneous determination of time-varying strength and location of fixed heat sources in 3D domain*, 6th International Conference Inverse Problems: Modeling and Simulation (IPMS 2012), Antalya, Turquie, 24-26 May 2012.
36. Museux N, Perez L., Autrique L., Agay D., *Skin burns after laser exposure: histological analysis and predictive simulation*, Burns, Vol. 38, n°5, pp. 658-667, 2012.
37. Ouarit H., Brémond S., Nouailletas R., Witrant E., Autrique L., *Validation of plasma current profile model predictive control in tokamaks via simulations*, Fusion Engineering and Design, Vol. 86, pp. 1018-1021, 2011.
38. Gaye O., Moulay E. Brémond S., Autrique L., Nouailletas R., Orlov Y., *Sliding mode stabilization of the current profile in Tokamak plasmas*, 50th IEEE Conference on Decision and Control and European Control Conference (CDC-ECC), Orlando, USA, December 12-15, 2011
39. Ouarit H., Brémond S., Artaud J.F., Basiuk V., Witrant E., Autrique L., *Model-based predictive control of tokamak plasma current*, 26th Symposium on Fusion Technology (SOFT), Porto, Portugal, Sept. 27 - Oct. 1, 2010.

Total number of published papers: 32 journal papers and 70+ international conference papers.



Research Group

Current members

- Jean-Claude JOLLY, PhD, Associate Professor
- Laetitia PEREZ, PhD, Associate professor, Habilitation à diriger des recherches (accreditation to supervise research)
- Thérèse AZAR, doctor, junior lecturer.

PhD candidates:

- Salim BIDOU (2020 -) « *Robust detection of failures by a set of mobile sensors - Applications in thermal engineering* ».

Past members (previous PhD students)

- Thanh Phong TRAN (2014-2017) « *Design of an experimental platform for the study of the displacement strategies of a pack of mobile sensors dedicated to the resolution of an Inverse Heat Conduction Problem* », now Assistant Prof. at Tien Giang University (Vietnam).
- Lamia ATTAR (2013-2017) « *Estimation of the radial profile of thermal diffusion in a thermonuclear fusion plasma for the control of the current profile* », now Dr. engineer in Akka, Toulouse (France).
- Alban Vergnaud (2012-2015) « *Adaptive deployment of a network of mobile sensors for monitoring an evolutionary phenomenon described by partial differential equations* », now Dr. Engineer in Europlacer, Rocheservière (France).
- Sara Beddiaf (2009-2013) « *Parametric identification of systems of nonlinear parabolic partial differential equations in 3D geometry by an iterative regularization method* ».
- Oumar Gaye (2009-2012) « *Security factor profile control in tokamak plasmas in infinite dimension* ».
- Nathanaelle Museux (2007-2010) « *Bio thermal expertise of materials subjected to intense infrared radiation: from parametric identification to risk assessment of burns* », now Dr. Engineer in French ministry of defence, Directorate General of Armaments, Font-Romeu (France).
- Mathieu Gillet (2005-2009) « *Analysis of intumescent systems under high flux: modeling and parametric identification* », now Dr. Engineer in French ministry of defence, Directorate General of Armaments, Font-Romeu (France).
- Corine Lormel (2002-2005) « *Analysis of a mathematical system modeling laser-skin interactions for the prediction of burns* ».
- Sébastien Rouquette (2000-2003) « *Identification of heat transfers by reverse method in a Plasma Assisted Chemical Vapor Deposition process* », now Assistant Prof. at University of Montpellier (France).



External Fundraising, research grants and industrial contracts

Internal research grant: « Robust detection of failures by a set of mobile sensors - Applications in thermal engineering », University of Angers, 86 k€, 2020-2023, PhD thesis co-supervisor.

External research grant: « New control strategies for PDE systems », RFI ATLANSTIC2020, 20 k€, support to the international collaboration with Prof. Y. Orlov (CICESE, Ensanada, Mexique) 2018-2021, principal investigator.

Industrial contract: « Thermal conductivity identification for protective paints », Naval Group, 72 k€, 2019, principal investigator.

- External research grant: « ConFuNuc – Control of nuclear fusion », RFI ATLANSTIC2020, 86 k€, 2017-2020, project coordinator, PhD thesis co-supervisor.
- External research grant: « ANR TORID – ref 12-BS03-008 - Tokamak cOntrol of plasma Radial profiles in Infinite Dimensional setting », Consortium budget 513 k€, 2012-2016, Leader on a work package.
- Industrial contract: « EMPATHIE: Investigation related to parametric identification based on heating periodic methods », IUT-Nantes, 34 k€, 2010-2014, co-principal investigator.
- Industrial contract: « PICOT: Thermography-oriented Communicating Inspection Prototype », ARM-Nantes, 350 k€, 2015-2017, Leader on a work package.
- External research grant: « Profile control of thermonuclear fusion plasmas », CEA (French Alternative Energies and Atomic Energy Commission), 86 k€, 2009-2012, Co-principal supervisor, PhD thesis co-supervisor.
- Industrial contract: « Measurement of thermal conductivity of paint systems », IPRS, 36 k€, 2009-2010, principal investigator.
- Industrial contract: « Federation of Defense Energy Materials Vulnerability Models », CAEPE, 37 k€, 2005-2008, co-principal investigator.
- External research grant: « Skin effects of laser radiation », French ministry of defence, Directorate General of Armaments, 130 k€, 2002-2005, Co-principal supervisor, PhD thesis co-supervisor.
- Industrial contract: « Thermal modeling of the sample for the spectral directional emissivity measurements in transient temperature regime: quantification of the flux exchanged by convection », LNE (Laboratoire national de métrologie et d'essais), 60 k€, 2000-2002, co-principal investigator.
- Industrial contract: « Measurement of spectral directional emissivity at high temperature: modeling of the evolution of the temperature of the investigated sample », LNE (Laboratoire national de métrologie et d'essais), 45 k€, 1999-2000, co-principal investigator.



Professional Activities

- Elected member of the French National Council of Universities (*CNU 61: computer engineering, control theory, signal processing*) since 2015.
- Head of the “Control engineering and Computer Engineering” department of the engineering school Polytech’ Angers since Oct. 2016.
- President of the education commission of the French club of researchers and teachers in Electrical and Information engineering (club EEA) since 2018.
- In charge of Atlantic2020 for the University of Angers. Atlantic2020 brings together the regional digital sciences ecosystem to rise to the challenges of the digital revolution, to improve visibility and increase attractiveness of the digital sector in Pays de la Loire and to meet the high demand for workers in this sector. To this end, it brings together Research, Training, and Innovation, giving each component specific goals.
- Member of IFAC TC 2.3 (Non-Linear Control Systems), TC 2.6 (Distributed Parameter Systems) and TC 9.4 (Control education) since 2014.
- Member of conference committees: IFAC-WC 2020, CODIT 2020, MECHATRONICS 2019, QCAV 2019, IFAC-ACE 2019, CoDIT 2019, QCAV 2017, IFAC-WC 2017, QCAV 2015, IFAC-SSC 2013, ...
- Associate editor of the French journal J3eA (Journal on the teaching of information sciences and technologies and systems) since 2018.

Conferences and Workshops Organization

In charge of the organization of « Demonstrators sessions » during the IFAC World Congress in Toulouse (France): about 70 demonstrators during 5 days in 2017.

In charge of the organization of WATIC workshop (*Workshop on Applications of Thermography in Inspection Context*) during the 12th International Conference on Quality Control by Artificial Vision, University of Burgundy in Le Creusot, France, juin 2015.

In charge of the organization of french workshops about « Demonstrators in control theory » in november 2010 and june 2013.

PhD Thesis Advisory Board

External reviewer for 13 PhD theses since 2012.

Journal referee

Automatica, IEEE Transactions on Automatic Control, ISA Transactions, International Journal of Applied Mathematics and Computer Science, Inverse problems in science and engineering, IEEE Transactions on Instrumentation and measurement, Burns ...

Expert for funding agencies European Science Foundation, Atlanstic2020, CONICYT (Chili), French ministry of defence, Directorate General of Armaments, ...

Current Teaching activities and responsibilities

Postgraduate: Process control, Control theory, Parametric identification, Inverse problem resolution, Numerical optimization methods, Nondestructive testing

Undergraduate: Mecatronics, Sensors and metrology, Programmable logic controller, Regulation, Applied electricity