

# Florimond Guéniat *19 novembre, 1984*

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School of Engineering and the Built Environment,  
Birmingham City University  
470, Millenium Point,  
Birmingham, B4 7XG UK

contact@gueniat.fr  
florimond.gueniat@bcu.ac.uk  
fgueniat (*Skype*)  
+44/0 7493 333 859  
http://www.gueniat.fr

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## Experience

- Birmingham City Univ.** BIRMINGHAM, UK  
**Lecturer in Control and Mechanical Engineering**  
Applied Mathematics, Fluid Mechanics and Control Engineering.  
2018 – present
- Univ. of Illinois** URBANA-CHAMPAING, IL, US  
**Research Scientist**  
Identification of slow manifold and reduced order models in stiff systems. Application to large-scale combustion.  
2016 – 2018
- Florida State** TALLAHASSEE, FL, US  
**Research Scientist**  
Closed-loop control of fluid flows via clusters and statistical learning. Application to fluid mechanics. Data assimilation with particle filters.  
2014 – 2016
- LIMSI-CNRS** ORSAY, FRANCE  
**Research Scientist**  
Identification of invariant structures, modal decomposition and reduced-order models. Application to turbulent flows.  
2013 – 2014
- LIMSI-CNRS** ORSAY, FRANCE  
**Graduate Research Assistant**  
Identification of invariant structures, modal decomposition and reduced-order models. Application to turbulent flows. Computer-human interfaces for the exploration of scientific dataset.  
2010 – 2013

*Please refer to my website for a more complete list of work experiences along with a list of collaborators and referees.*

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## Education

- Univ. Paris Sud** ORSAY, FRANCE  
**PhD in Mechanical Engineering**  
Thesis entitled: "Coherent structures in Fluid Mechanics, and Human-Computer interface for SciViz".  
Graduated with distinctions.  
2010 – 2013
- Univ. Paris Sud** ORSAY, FRANCE  
**Bachelor and Master degree of Mechanical Engineering**  
Bachelor and Master degrees from Paris-Sud Univ.  
Thesis entitled: "Koopman Modes: Filtering and modeling turbulent flows".  
Graduated with distinctions.  
2008 – 2010
- École Nationale d'Arts et Métiers** ANGERS, FRANCE  
**French top engineering school**  
2006 – 2008

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## Research

3 graduated students, 4 post-graduated students

Last Name	First Name	Role	Degree	Date
Shehzad	Muhammad	Chair	PhD	2020-
Mudiyanselage	Promod	Chair	PhD	2020-
Dos Santos	Invanilson	Chair	PhD	2020-
Issartel	Paul	Co Chair	PhD	2012-2017
Christophe	Julien	Advisor	Ms	2012-2013
Issartel	Paul	Advisor	Ms	2011-2012
Gaffary	Yoren	Co-Advisor	Ms	2010-2011

### Publications in International journal with peer review process

- S. Bryngelson, F. Guéniat, and J.B. Freund. "Irregular dynamics of cellular blood flow in a model microvessel." In: *Physical Review E* 1.100 (2019), p. 012203.
- F. Guéniat. "On the data-driven selection of observables in fluid flows". In: *Experiments in Fluids (submitted)* (2017).
- P. Issartel, F. Guéniat, T. Isenberg, and M. Ammi. "Analysis of Locally Coupled 3D Manipulation Mappings Based on Mobile Device Motion". In: *Presence: Teleoperators and Virtual Environments* 26.1 (2017), pp. 66–95.
- F. Guéniat, L. Mathelin, and M.Y. Hussaini. "A statistical learning strategy for closed-loop control of fluid flows". In: *Theoretical Computational Fluid Dynamics* 30.6 (Dec. 2016), pp. 497–510.
- F. Guéniat, L. Mathelin, and L.R. Pastur. "A dynamic mode decomposition approach for large and arbitrarily sampled systems". In: *Physics of Fluids* 27.2 (Feb. 2015), p. 025113.
- F. Guéniat, L. Pastur, and F. Lusseyran. "Investigating mode competition and three-dimensional features from two-dimensional velocity fields in an open cavity flow by modal decompositions". In: *Physics of Fluids* 26.8 (Aug. 2014), p. 085101.
- A. Cammilleri, F. Guéniat, J. Carlier, L. Pastur, E. Memin, F. Lusseyran, and G. Artana. "POD-spectral decomposition for fluid flow analysis and model reduction". In: *Theoretical Computational Fluid Dynamics* 27.6 (Feb. 2013), pp. 787–815.

### Publications in proceedings of international conferences with peer review process

- F. Guéniat. "Reduced Order Modeling in Combustion". In: *th International Symposium : Bifurcations and Instabilities in Fluid Dynamics*. 2019.
- F. Guéniat. "Stokes flows and chaos - studying the dynamics of red blood cells". In: *Stokes 200, Penbroke College, Cambridge*. 2019.
- C. Pivot, L. Mathelin, L. Cordier, F. Guéniat, and B.R Noack. "A continuous reinforcement learning strategy for closed-loop control in fluid dynamics". In: *Proc. of AIAA AVIATION Forum*. 2017.
- P. Issartel, L. Besancon, F. Guéniat, T. Isenberg, and M. Ammi. "Preference Between Allocentric and Egocentric 3D Manipulation in a Locally Coupled Configuration". In: *Proceedings of the 2016 Symposium on Spatial User Interaction (SUI2016)*. 2016, pp. 79–88.
- F. Guéniat, L. Mathelin, and Y.M. Hussaini. "State aggregation and reinforcement learning for the closed-loop control of black-box systems". In: *Bifurcations and Instabilities in Fluid Dynamics*. 2015.
- P. Issartel, F. Guéniat, S. Coquillart, and M. Ammi. "Perceiving Mass in Mixed Reality through Pseudo-Haptic Rendering of Newton's Third Law". In: *IEEE Virtual Reality*. 2015, pp. 41–46.
- P. Issartel, F. Guéniat, and M. Ammi. "A Portable Interface for Tangible Exploration of Volumetric Data". In: *Virtual Reality Software and Technology*. 2014, pp. 209–210.
- P. Issartel, F. Guéniat, and M. Ammi. "Slicing Techniques for Handheld Augmented Reality". In: *Symposium on 3D User Interfaces (3DUI 2014)*. 2014, pp. 39–45.
- F. Guéniat, J. Christophe, Y. Gaffary, and M. Ammi. "Tangible Windows for a free Exploration of Wide 3D Virtual Environment". In: *Proceedings of the 19th ACM Symposium on Virtual Reality Software and Technology*. Ed. by ACM. ACM, 2013, pp. 115–118.
- F. Guéniat, L. Pastur, Y. Fraigneau, and F. Lusseyran. "Lagrangian Coherent Structures in Open Cavity Flows". In: *14th European Turbulence Conference*. 2013.
- F. Guéniat, L. Pastur, Y. Fraigneau, and F. Lusseyran. "Shear layer modes competition in Open Cavity Flow: Experimental and Numerical Exploration of 3D features through a 3D DMD analysis". In: *Bifurcations and Instabilities in Fluid Dynamics*. 2013.
- F. Lusseyran, J. Basley, F. Guéniat, and L. Pastur. "Pertinence des champs bidimensionnels dans l'analyse des". In: *Actes du 21ème Congrès Français de Mécanique*. 2013, pp. 1–6.
- F. Guéniat, Y. Gaffary, L. Pastur, and A. Mehdi. "Haptic stimulus for the discrimination between intrinsic properties of dynamic systems". In: *Lectures notes in Computer Science*. Vol. 7283. Springer, 2012, pp. 37–42.
- T. Klein, F. Guéniat, L. Pastur, F. Vernier, and T. Isenberg. "A Design Study of Direct-Touch Interaction for Exploratory 3D Scientific Visualization". In: *Computer Graphic Forum*. Vol. 31. 3. June 2012, pp. 1225–1234.
- C. Douay, F. Guéniat, L. Pastur, F. Lusseyran, and T. Faure. "Instabilités centrifuges dans un écoulement de cavité: Décomposition en Modes Dynamiques". In: *Actes des Rencontres du Non-Linéaire*. 2011, pp. 47–52.
- F. Guéniat, C. Douay, L. Pastur, F. Lusseyran, and T. Faure. "Signature fréquentielle des structures cohérentes d'écoulement: application de la décomposition en modes dynamiques à un écoulement en cavité ouverte". In: *20ème Congrès Français de Mécanique*. Editions du Non-Linéaire, 2011, p. 363.
- F. Guéniat, L. Pastur, and F. Lusseyran. "GPU and SIMD Acceleration for Identification of Lagrangian Coherent Structures. Application to an Open Cavity Flow". In: *Proceedings of the Bifurcations and Instabilities in Fluid Dynamics Symposium*. 2011.
- F. Guéniat, L. Pastur, F. Lusseyran, and T. Faure. "Opérateur de Koopman et identification de structures cohérentes: application à un écoulement de cavité". In: *Actes des Rencontres du Non-Linéaire*. Editions du Non-Linéaire, 2011, pp. 87–92.

F. Lusseyran, F. Guéniat, J. Basley, C. Douay, L. Pastur, T. Faure, and P. Schmid. "Flow coherent structures and frequency signature: application of the dynamic modes decomposition to open cavity flow". In: *Journal of Physics: Conference series*. Vol. 318. 4. 2011, p. 042036.

*Please refer to my [website](#) for an exhaustive list of my scientific production.*

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## Teaching

Teaching Evaluation Summary:

Awarded by the French Counsel of Universities in Computer Science (2013) and Mechanical Engineering (2014). SEDA and PGCERT: in process.

Birmingham City Univ.

BIRMINGHAM, UK  
2018 –

### Lecturer in Control and Mechanical Engineering

- Mathematics
  - ENG3009: Mathematics for Engineers I.
  - ENG3012: Mathematics for Engineers II.
  - ENG4124: Mathematical Modelling I.
  - ENG4125: Mathematical Modelling II.
- Mechanical and Automotive engineering
  - ENG6061: Power and Energy Systems II
  - ENG7147: Advanced Powertrains and Control
  - ENG6076: Vehicle Electronics and Control
  - ENG6032: Hybrid Vehicles
- Control engineering
  - ENG7148: Control Engineering
  - ENG6074: Dynamics and Control
  - ENG6074: Vehicle Control Systems

Univ. Paris Sud

ORSAY, FRANCE  
2011 – 2013

### Teaching assistant

- Computer science
  - LIS 3201: Algorithms and programming theory
  - ME 327: Haptics and physics engine
- Mathematics
  - MGF 3301: Linear Algebra
  - MAS 3105: Linear Algebra

Univ. Pierre et Marie Curie

PARIS, FRANCE  
2010 – 2011

### Teaching assistant

- Mechanical Engineering
  - EML3016: Fluid mechanics

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## Honors & Awards

Member of the Scientific Committee of the Digital Tools and Uses Congress

Reviewer for

- Physics of Fluids
- Theoretical and Computational Fluid Dynamics
- International Communications in Heat and Mass Transfer
- MDPI Applied Science
- NIPS 2016
- EuroHaptics 2014

2014

### Best paper award

University of Edimburgh  
*Virtual Reality Software and Technology (VRST 2014)*

A Portable Interface for Tangible Exploration of Volumetric Data,

2012

### Best paper award

Ecole Polytechnique  
*Digitéo 2012*

Detection of Coherent Structures in a Flow and Interaction with Large Dataset