

Florimond Guéniat, PhD

19 novembre, 1984

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Birmingham City University
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Experience

- IET** BIRMINGHAM, UK
Artificial Intelligence Technical Network committee member 2024 – present
Member of the committee. Responsibilities are to promote and support AI integration in businesses, and to develop policies.
- Birmingham City Univ.** BIRMINGHAM, UK
Academic Lead Mechanical Engineering 2023 – present
Manage the research and teaching outputs of 24 academics. Responsibilities are to provide academic leadership for mechanical and automotive engineering
— Developping an industry-relevant curriculum
— Promoting impactfull research and knowledge exchange
— Contributing to the recruitment of staff and ensure resources are in place
- Birmingham City Univ.** BIRMINGHAM, UK
Team Lead automotive Engineering 2022 – 2023
Manage the research and teaching outputs of 12 academics.
— NSS score improved from 58.3% to 86.3%
— Research outputs by the team increased by 50% on the period, for 9 out 12 academics
— Number of external funding applications by the team increased on the period by 75%
- Birmingham City Univ.** BIRMINGHAM, UK
Course Lead MSc automotive Engineering 2022 – present
Manage the MSc automotive engineering.
- Birmingham City Univ.** BIRMINGHAM, UK
Senior Lecturer in Control and Mechanical Engineering 2021 – present
Teaching in Automotive & Control Engineering and Applied Mathematics.
Research in smart aerodynamics, and design & optimization of networks of smart minigrids.
- Birmingham City Univ.** BIRMINGHAM, UK
Lecturer in Control and Mechanical Engineering 2018 – 2021
Research and Teaching in Automotive & Control Engineering and Applied Mathematics.
- Univ. of Illinois** URBANA-CHAMPAIN, IL, US
Research Scientist 2016 – 2018
Identification of slow manifold and reduced order models in stiff systems. Application to large-scale combustion.
- Florida State** TALLAHASSEE, FL, US
Research Scientist 2014 – 2016
Closed-loop control of fluid flows via clusters and statistical learning. Application to fluid mechanics.
Data assimilation with particle filters.
- LIMSI-CNRS** ORSAY, FRANCE
Research Scientist 2013 – 2014
Identification of invariant structures, modal decomposition and reduced-order models. Application to turbulent flows.
- LIMSI-CNRS** ORSAY, FRANCE
Graduate Research Assistant 2010 – 2013
Identification of invariant structures, modal decomposition and reduced-order models. Application to turbulent flows.
Computer-human interfaces for the exploration of scientific dataset.

Please refer to my [website](#) for a more complete list of work experiences along with a list of collaborators and referees.

Education

- Birmingham City Univ. BIRMINGHAM, UK
Postgraduate Certificate in Higher Education 2019-2020
PGCert in Enhancing Learning, Teaching and Assessment Practice in Higher Education.
- Univ. Paris Sud ORSAY, FRANCE
PhD in Mechanical Engineering 2010 – 2013
Thesis entitled: "Coherent structures in Fluid Mechanics, and Human-Computer interface for SciViz".
Graduated with distinctions.
- Univ. Paris Sud ORSAY, FRANCE
Bachelor and Master degree of Mechanical Engineering 2008 – 2010
Bachelor and Master degrees from Paris-Sud Univ.
Thesis entitled: "Koopman Modes: Filtering and modeling turbulent flows".
Graduated with distinctions.
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Honors & Awards

- Member of the Scientific Committee of the Digital Tools and Uses Congress
Chair for the session on "Optimal Control", European Control Conference 2021
Reviewer for
- EPSRC (turbulence)
 - Physics of Fluids
 - Theoretical and Computational Fluid Dynamics
 - International Communications in Heat and Mass Transfer
 - NeurIPS 2016
 - EuroHaptics 2014
- 2022 Seattle
Best presenter Award *IEEE World AI IoT Congress (IEEE AIoT 2022)*
Enhanced Data-Driven LoRa LP-WAN Channel Model in Birmingham
- 2014 University of Edimburgh
Best paper award *Virtual Reality Software and Technology (VRST 2014)*
A Portable Interface for Tangible Exploration of Volumetric Data,
- 2012 Ecole Polytechnique
Best paper award *Digiteo 2012*
Detection of Coherent Structures in a Flow and Interaction with Large Dataset
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Research

20+ graduated students, 5 post-graduated students

Last Name	First Name	Role	Degree	Date
Nejati	Muhammad	Chair	PhD	2022-
Elsabaa	Elsabaa	Co Chair	PhD	2021-
Maryam	Sadhia	Chair	PhD	2018-2021
Issartel	Paul	Co Chair	PhD	2012-2017

- Organizer of the International Workshop on Data-driven strategies to control engineering flows - French Embassy, London, 2020
<https://uk.ambafrance.org/Seed-meeting-Data-driven-control-for-engineering-flows-symposium>

Books and book chapters

- Sandeep Dhundhara, Mandeep Sharma, Florimond Guéniat, and Yogendra Arya. "Overview of the renewable-dominated power systems and their frequency regulation issues". In: *Advanced Frequency Regulation Strategies in Renewable-Dominated Power Systems*. Elsevier, 2024, pp. 1–19.
- Samsul Ariffin Bin Abdul Karim, Mark Ovinis, and Florimond Guéniat. *Artificial Intelligence: Ethics and Safety in Engineering*. Elsevier, 2024.

Publications in International journal with peer review process

- M. H. Nejadi Amiri and F. Guéniat. "Towards a framework for measurements of power systems resiliency: Comprehensive review and development of graph and vector-based resilience metrics". In: *Sustainable Cities and Society* (2024), p. 105517. eprint: <https://doi.org/10.1016/j.scs.2024.105517>.
- F. Guéniat and S. Maryam. "A comprehensive and policy-oriented model of the hydrogen vehicle fleet composition, applied to the UK market". In: *Environment Systems and Decisions* (2023).
- V. Baker, F. Guéniat, D. Axford, P. Aller, N. Baker, G. Leen, and P. Docker. "Tractor beam acoustic levitation for time resolved crystallography experiments". In: *Journal of Physics: Conference Series* (2022).
- Emad Soltani, Ehsan Ahmadi, Florimond Guéniat, and Mohammad Reza Salami. "A review of bridge health monitoring based on machine learning". In: *Proceedings of the Institution of Civil Engineers* (2022), pp. 1–11.
- 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.
- 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

- A. ElSabaa, F. Guéniat, W. Wu, and M. Ward. "Enhanced Data-Driven LoRa LP-WAN Channel Model in Birmingham". In: *Proceedings of the IEEE AIIOT*. 2022.
- M. Faisal Shehzad and F. Guéniat. "Modeling and Optimal Control of Energy Storage System For Battery Life Extension Via Model Predictive Control". In: *Proceedings of European Control Conference*. 2021.
- M. Faisal Shehzad and F. Guéniat. "Optimal operation of renewable energy microgrids considering lifetime characteristics of battery energy storage system". In: *Proceedings of the 60th IEEE Conference on Decision and Control*. 2021.
- F. Guéniat. "Deep reinforcement learning strategies for the reduction of the drag in the flow past bluff bodies". In: *ATE HEFAT*. 2021.
- F.A. Laureano De Leon, F. Guéniat, and H.T. Madabushi. "SemEval-2020 Task 9: The effectiveness of code-switched word embeddings for sentiment analysis". In: *Coling 2020*. 2020.
- 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.

Please refer to my website for an exhaustive list of my scientific production.

Grants and fundings

2024

- "ArtPackAI-3D: from art piece to client - end to end intelligent Art Packaging with AI Optimisation", BridgeAI Innovate UK, £70k, pending
Automation of the AI-powered pipeline to design optimized protective packaging for art pieces.
- "Smart-Sip: innovative approaches to downstream energy utilisation from solar rrigation pumps in Bangladesh", Ayrton Challenge, UKRI, pending
Design of a new smart business model for smart grid providers and farmers in Bangladesh.

2023

- "ArtPackAI: Intelligent Art Packaging with AI Optimization", BridgeAI Innovate UK, £38k, successful
Automation of the AI-powered pipeline to design optimized protective packaging for art pieces.
- "IoT4Solarv2", Research grant, InnovateUK, £1100k , unsuccessful
Design of a smart predictive O&M AI system for smart grid providers in Nigeria.
- "Innovative approaches to downstream energy utilisation from solar irrigation in India and Bangladesh, Research grant, InnovateUK, £300k, unsuccessful
Design of an innovative business model involving solar based pumps and cold storages in Indian and Bangladesh.

2022

- "Artificial intelligence evolution Ary biomimetic route drag reduction", EPSRC Horizon 2022, £200k, unsuccessful
- "Energy crisis in Bangladesh and India", InnovateUK Catalyst round 9, £100k, unsuccessful
- "Cascade", Diversity Impact Programme, RAEng, £100k, unsuccessful

2021

- "Support for attending the Conference on Decision and Control 2021", Travel grant, SuperSolar Scheme, £500, successful
- "on-grid@BCU", Equipment grant, BCU internal funding, £3k, successful

2020

- "Workshop on Data-driven strategies to control engineering flows", workshop grant French Embassy, £10k, successful
- "off-grid@BCU", Equipment grant, BCU internal funding, £6k, successful
- "IoT4Solar", Research grant, InnovateUK, £1400k , unsuccessful
- "A Machine Learning-based Approach for Drag Reduction", Research grant, EPSRC New-Horizon, £300k , unsuccessful

2010

- "Fluctus", PhD funding, Digiteo, £120k, successful

Teaching

Teaching Evaluation Summary:

Awarded by the French Counsel of Universities in Computer Science (2013) and Mechanical Engineering (2014).
Awarded PGCERT in 2020.

Birmingham City Univ.

Lecturer then Senior Lecturer in Control and Mechanical Engineering

BIRMINGHAM, UK
2018 –

- Current Module Leader
 - ENG7147: Advanced Powertrain and Control.
Satisfaction increased from 3.5 (2020) to 4.5 (2023)
 - ENG7148: Control Engineering.
Satisfaction increased from 3.6 (2020) to 4.7 (2023)

- Past Module Leader in Mechanical engineering
 - ENG6061: Power and Energy Systems II.
 - ENG6074: Dynamics and Control.
- Past Module Leader in Automotive engineering
 - ENG6032: Hybrid Vehicles.
 - ENG6076: Vehicle Electronics and Control.
 - ENG7053: Vehicle Control Systems.
- Past Continuous Professional Development (CPD) course
 - ENG7217: Electric Vehicle Technologies.

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 Lab
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