Florent Foucaud

Post-doctoral researcher in Graph Theory and Algorithms

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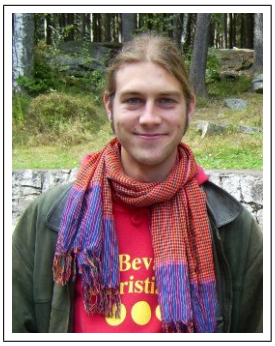
Born in 1986
Nationalities: French, German



(CV updated February 2, 2020)

Education and Employment

09.2019–today **Postdoctoral researcher**,
LaBRI, Université de Bordeaux, France,
Advisor: Éric Sopena.

03.2019–07.2019 **Teaching assistant**,
Departments of Computer Science at IUT d'Orléans and Université d'Orléans, Orléans (France),
Teaching: 128h eqTD.

01.2019–03.2019 **Visiting researcher**,
Research stays at IIT Madras, ISI Kolkata and IIT Dharwad (India).

01.2018–12.2018 **Postdoctoral researcher**,
LIMOS, Université Clermont Auvergne, Clermont-Ferrand, France,
Advisor: Lhouari Nourine.

03.2016–12.2017 **Independent researcher**,
Various research stays including at Thompson Rivers University (Kamloops, Canada) and Universidad Autonoma de Mexico (Querétaro, Mexico).

11.2014–02.2016 **Postdoctoral researcher**,
LIMOS, Université Blaise Pascal, Clermont-Ferrand, France,
Advisor: Laurent Beaudou.

01.2014–12.2014 **Postdoctoral researcher**,
Department of Mathematics, University of Johannesburg, South Africa & LAMSADE, Université Paris-Dauphine, France,
Advisor: Michael A. Henning.

02.2013–12.2013 **Postdoctoral researcher**,
Combgraph team, Universitat Politècnica de Catalunya (UPC), Barcelona, Spain,
Advisors: Camino Balbuena and Oriol Serra.

09.2009–12.2012 **PhD in Computer Science and teaching assistant**,
LaBRI, Université Bordeaux 1, France, "mention Très Honorable".
Advisors: Ralf Klasing and André Raspaud.
Thesis: Combinatorial and algorithmic aspects of identifying codes in graphs.
Teaching: 192h eqTD at the Departement of Computer Science of IUT Bordeaux 1.

2007–2009 **Master in Computer Science, speciality "Algorithms and Formal Methods"**,
Université Bordeaux 1, France, "mention Très Bien".
Advisors: Ralf Klasing and André Raspaud.
Thesis: Identifying codes in special graph classes.

Publications: journal articles

[J32] F. Foucaud, S. Heydarshahi, A. Parreau. Domination and location in twin-free digraphs. *Discrete Applied Mathematics*, accepted. (arXiv link)

[J31] A. Dailly, F. Foucaud, A. Hansberg. Strengthening the Murty-Simon conjecture on diameter 2 critical graphs. *Discrete Mathematics* 342(11):3142–3159, 2019. (DOI link)

[J30] L. Beaudou, R. C. Brewster, F. Foucaud. Broadcast domination and multipacking: bounds and the integrality gap. *Australasian Journal of Combinatorics* 74(1):86–97, 2019. (www link)

[J29] L. Beaudou, F. Foucaud, R. Naserasr. Homomorphism bounds of signed bipartite K_4-minor-free graphs and edge-colourings of $2k$-regular K_4-minor-free multigraphs. *Discrete Applied Mathematics* 261:40–51, 2019. (DOI link)

[J28] C. Bazgan, F. Foucaud, F. Sikora. Parameterized and approximation complexity of PARTIAL VC DIMENSION. *Theoretical Computer Science* 766:1–15, 2019. (DOI link)

[J27] É. Bonnet, F. Foucaud, E. Kim, F. Sikora. Complexity of Grundy coloring and its variants. *Discrete Applied Mathematics* 243:99-114, 2018. (DOI link)

[J26] L. Beaudou, P. Dankelmann, F. Foucaud, M. A. Henning, A. Mary and A. Parreau. Bounding the order of a graph using its diameter and metric dimension: a study through tree decompositions and VC dimension. *SIAM Journal on Discrete Mathematics* 32(2):902–918, 2018. (DOI link)

[J25] F. Foucaud, R. Klasing. Parameterized and approximation complexity of the detection pair problem in graphs. *Journal of Graph Algorithms and Applications* 21(6):1039–1056, 2017. (DOI link)

[J24] F. Foucaud, A. Harutyunyan, P. Hell, S. Legay, Y. Manoussakis, R. Naserasr. The complexity of tropical graph homomorphisms. *Discrete Applied Mathematics* 229:64–81, 2017. (DOI link)

[J23] L. Beaudou, F. Foucaud, R. Naserasr. Homomorphism bounds and edge-colourings of K_4-minor-free graphs. *Journal of Combinatorial Theory, Series B* 124:128–164, 2017. (DOI link)

[J22] F. Foucaud, G. B. Mertzios, R. Naserasr, A. Parreau, P. Valicov. Identification, location-domination and metric dimension on interval and permutation graphs. II. Complexity and algorithms. *Algorithmica* 78(3):914–944, 2017. (DOI link)

[J21] F. Foucaud, G. B. Mertzios, R. Naserasr, A. Parreau, P. Valicov. Identification, location-domination and metric dimension on interval and permutation graphs. I. Bounds. *Theoretical Computer Science* 668:43–58, 2017. (DOI link)

[J20] O. Baudon, J. Bensmail, F. Foucaud, M. Pilsńiak. Structural properties of recursively partitionable graphs with connectivity 2. *Discussiones Mathematicae Graph Theory* 37(1):89–115, 2017. (DOI link)

[J19] F. Foucaud, G. Perarnau, O. Serra. Random subgraphs make identification affordable. *Journal of Combinatorics* 8(1):57–77, 2017. (DOI link)

[J18] R. C. Brewster, F. Foucaud, P. Hell, R. Naserasr. The complexity of signed and edge-coloured graph homomorphisms. *Discrete Mathematics* 340(2):223–235, 2017. (DOI link)

[J17] F. Foucaud, M. A. Henning. Location domination in line graphs. *Discrete Mathematics* 340(1):3140–3153, 2017. (DOI link)

[J16] F. Foucaud, M. A. Henning. Locating-total dominating sets in twin-free graphs: a conjecture. *The Electronic Journal of Combinatorics* 23(3):P3.9, 2016. (www link)

[J15] F. Foucaud, M. A. Henning. Location-domination and matching in cubic graphs. *Discrete Mathematics* 339(4):1221–1231, 2016. (DOI link)

[J14] F. Foucaud, M. A. Henning, C. Löwenstein, T. Sasse. Locating-dominating sets in twin-free graphs. *Discrete Applied Mathematics* 200:52–58, 2016. (DOI link)

[J13] C. Balbuena, F. Foucaud, A. Hansberg. Locating-dominating sets and identifying codes in graphs of girth at least 5. *The Electronic Journal of Combinatorics* 22(2):P2.15, 2015. (www link)

[J12] F. Foucaud. Decision and approximation complexity for identifying codes and locating-dominating sets in restricted graph classes. *Journal of Discrete Algorithms* 31:48–68, 2015. (DOI link)

[J11] F. Foucaud, M. Krivelevitch, G. Perarnau. Large subgraphs without short cycles. *SIAM Journal on Discrete Mathematics* 29(1):65–78, 2015. (DOI link)

[J10] F. Foucaud, R. Klasing, P. J. Slater. Centroidal bases in graphs. *Networks* 64(2):96–108, 2014. (DOI link)

[J9] F. Foucaud, T. Laihonen, A. Parreau. An improved lower bound for $(1, \leq 2)$-identifying codes in the king grid. *Advances in Mathematics of Communications* 8(1):35–52, 2014. (DOI link)

[J8] O. Baudon, F. Foucaud, J. Przybyło, M. Woźniak. On the structure of arbitrarily partitionable graphs with given connectivity. *Discrete Applied Mathematics* 162:381–385, 2014. (DOI link)

[J7] F. Foucaud, M. Kovše. Identifying path covers in graphs. *Journal of Discrete Algorithms* 23:21–34, 2013. (DOI link)

[J6] F. Foucaud, S. Gravier, R. Naserasr, A. Parreau, P. Valicov. Identifying codes in line graphs. *Journal of Graph Theory* 73(4):425–448, 2013. (DOI link)

[J5] F. Foucaud, R. Naserasr, A. Parreau. Characterizing extremal digraphs for identifying codes and extremal cases of Bondy's theorem on induced subsets. *Graphs and Combinatorics* 29(3):463–473, 2013. (DOI link)

[J4] F. Foucaud, R. Klasing, A. Kosowski, A. Raspaud. Bounds on the size of identifying codes in triangle-free graphs. *Discrete Applied Mathematics* 160(5-6):1532–1546, 2012. (DOI link)

[J3] F. Foucaud, I. Honkala, T. Laihonen, A. Parreau, G. Perarnau. Locally identifying colourings for graphs with given maximum degree. *Discrete Mathematics* 312(10):1832–1837, 2012. (DOI link)

[J2] F. Foucaud, G. Perarnau. Bounds on identifying codes in terms of degree parameters. *The Electronic Journal of Combinatorics* 19:P32, 2012. (www link)

[J1] F. Foucaud, E. Guerrini, M. Kovše, R. Naserasr, A. Parreau, P. Valicov. Extremal graphs for the identifying code problem. *European Journal of Combinatorics* 32(4):628–638, 2011. (DOI link)

Publications: conferences with refereed proceedings

[C13] D. Chakraborty, F. Foucaud, H. Gahlawat, S. K. Ghosh, B. Roy. Hardness and approximation for the geodetic set problem in some graph classes. Proceedings of the 6th International Conference on Algorithms and Discrete Applied Mathematics (CALDAM 2020). *Lecture Notes in Computer Science* 12016:102–115, 2020. (DOI link)

[C12] F. Foucaud, R. Klasing, M. Miller, J. Ryan. Monitoring the edges of a graph using distances. Proceedings of the 6th International Conference on Algorithms and Discrete Applied Mathematics (CALDAM 2020). *Lecture Notes in Computer Science* 12016:28–40, 2020. (DOI link)

[C11] L. Beaudou, F. Foucaud, R. Naserasr. Smallest not C_{2l+1}-colourable graphs of odd-girth $2k+1$. Proceedings of the 6th International Conference on Algorithms and Discrete Applied Mathematics (CALDAM 2020). *Lecture Notes in Computer Science* 12016:184–196, 2020. (DOI link)

[C10] F. Foucaud, H. Hocquard, D. Lajou, V. Mitsou, T. Pierron. Parameterized complexity of edge-colored and signed graph homomorphism problems. Proceedings of the 14th International Symposium on Parameterized and Exact Computation (IPEC 2019). *Leibniz International Proceedings in Informatics (LIPIcs)* 148,15:1-15:16, 2019. (DOI link)

[C9] L. Beaudou, F. Foucaud, L. Nourine, F. Madelaine, G. Richard. Complexity of regular path query homomorphisms. Proceedings of the 15th Conference on Computability in Europe, CIE 2019. *Lecture Notes in Computer Science* 11558:108-119, 2019. (DOI link)

[C8] C. Bazgan, F. Foucaud, F. Sikora. On the approximability of Partial VC Dimension. Proceedings of the 10th Annual International Conference on Combinatorial Optimization and Applications, COCOA 2016. *Lecture Notes in Computer Science* 10043:92–106, 2016. (DOI link)

[C7] F. Foucaud, G. B. Mertzios, R. Naserasr, A. Parreau, P. Valicov. Algorithms and complexity for metric dimension and location-domination on interval and permutation graphs. Proceedings of the 41st Workshop on Graph-Theoretic Concepts in Computer Science, WG 2015. *Lecture Notes in Computer Science* 9224:456–471, 2016. (DOI link)

[C6] É. Bonnet, F. Foucaud, E. Kim, F. Sikora. Complexity of Grundy coloring and its variants. Proceedings of the 21st International Conference on Computing and Combinatorics, COCOON 2015. *Lecture Notes in Computer Science* 9198:109–120, 2015. (DOI link)

[C5] F. Foucaud, R. Naserasr. The complexity of signed graph homomorphisms and signed constraint satisfaction. Proceedings of the 11th Latin American Symposium on Theoretical Informatics, LATIN 2014. *Lecture Notes in Computer Science* 8392:526–537, 2014. (DOI link)

[C4] F. Foucaud, G. Perarnau, O. Serra. Random subgraphs make identification affordable. Proceedings of the 7th European Conference on Combinatorics, Graph Theory and Applications, EUROCOMB 2013. *CRM Series* 16:415–420, 2013. (DOI link)

[C3] F. Foucaud. The complexity of the identifying code problem in restricted graph classes. Proceedings of the 24th International Workshop on Combinatorial Algorithms, IWOCA 2013. *Lecture Notes in Computer Science* 8288:150–163, 2013. (DOI link)

[C2] F. Foucaud, M. Kovše. On graph identification problems and the special case of identifying vertices using paths. Proceedings of the 23rd International Workshop on Combinatorial Algorithms, IWOCA 2012. *Lecture Notes in Computer Science* 7643:32–45, 2012. (DOI link)

[C1] F. Foucaud, S. Gravier, R. Naserasr, A. Parreau, P. Valicov. Edge identifying codes. Proceedings of the 6th European Conference on Combinatorics, Graph Theory and Applications, EUROCOMB 2011. *Electronic Notes in Discrete Mathematics* 38:343–348, 2011. (DOI link)

Publications: submitted work

[S3] F. Foucaud, B. Gras, A. Perez, F. Sikora. Parameterized complexity of broadcast domination and multipacking in digraphs. Submitted, 01.2020.

[S2] F. Dross, F. Foucaud, V. Mitsou, P. Ochem, T. Pierron. Complexity of planar signed graph homomorphisms to cycles. Submitted, 07.2019.

[S1] S. Dey, F. Foucaud, S. C. Nandy, A. Sen. Discriminating codes in geometric setups. Submitted, 09.2019.

Teaching

03.2020 Course on "Representation and encoding of information" (part on "coding des images/sounds/videos, data compression"), 1st year of Bsc at Université d'Orléans (5h).

12.2019 "scientific paper reading", supervision of 4 CS Msc students at Université de Bordeaux (3h eqTD).

03.2019–06.2019 72h eqTD at CS Departement of IUT d'Orléans.

- Basics of conception (GIT), DUT 1A, TP (12h).
- Basics of conception (UML), DUT 1A, TP/TD (12h).
- Databases (MySQL, PSQL, JDBC), DUT 1A, TD (14h) et TP (42h).
- Human-Machine Interaction, DUT "année spéciale", TD (12h).
- Project tutoring, two groups, DUT 1A (4h eqTD).

03.2019–06.2019 56h eqTD at CS Departement of Université d'Orléans.

- Course on "Representation and encoding of information" (part on "coding des images/sounds/videos, data compression"), 1st year of Science Bsc (5h).
- Algorithmics of discrete structures, 2nd year of CS Bsc, TP (6h).
- Representation and encoding of information, 1st year of Science Bsc, TP (18h).
- Algorithms and Programming, 1st year of Science Bsc, TP (12h).
- Tutoring of 12 interns at 3rd year of CS Bsc (24h eqTD).

2009–2012 192h eqTD at CS Department of IUT Bordeaux 1.

- Linear algebra and geometry, Licence pro, cours/TD (40h).
- UML and advanced object-oriented programming, DUT "année spéciale", cours/TD (52h).
- UML and conception, DUT 1A, cours/TD (28h).
- System programming, DUT 2A, cours/TP (16h).
- Java Enterprise Edition (JEE), DUT 2A, TP (16h).
- Event-oriented programming in C#, DUT 1A, TP (20h).
- Usage of computer systems, DUT 1A, TP (10h).
- Algorithms and Programming, DUT 1A, TP (10h).

Student supervision

2020 Master 2 internship of Sébastien Clauzel at LaBRI, Bordeaux. Topic: Complete colorings of signed graphs. Co-supervised with Éric Sopena.

2020 Master 2 internship of Sara Vita at LaBRI, Bordeaux. Topic: Switching homomorphisms of signed digraphs. Co-supervised with Éric Sopena.

2018 Master 1 internship of Tristan Benoit at LIMOS, Clermont-Ferrand. Topic: Metric dimension of 2-trees. Co-supervised with Laurent Beaudou, Aurélie Lagoutte and Florent Madelaine.

Scientific community-related activities

- Member of Programme Committee of the conference *IWOCA 2020*, Bordeaux, France, June 2020 `http://iwoca2020.labri.fr`.
- Member of Programme Committee of the "International Conference on Emerging Trends in Mathematical Sciences & Computing" (IEMSC-20), Calcutta, India, Feburary 2020 `http://iemsc.uem.edu.in`.
- Active member of the organizing committees of the conferences *BWIC 2011* `http://bwic2011.labri.fr`, *SEA 2012* `http://sea2012.labri.fr` and *IWOCA 2020* `http://iwoca2020.labri.fr` (co-chair)

• Refereed 27 papers for journals and 13 papers for conferences.
Journals: *Ars Combinatoria*, *Australasian Journal of Combinatorics*, *Discrete Applied Mathematics* (x7), *Discrete Mathematics* (x3), *Discrete Mathematics & Theoretical Computer Science* (x2), *European Journal of Combinatorics*, *Information Processing Letters* (x2), *Journal of Combinatorial Mathematics and Combinatorial Computing*, *Journal of Graph Theory*, *Questiones Mathematicae*, *The Electronic Journal of Combinatorics* (x2), *Theoretical Computer Science* (x4), *Transactions on Combinatorics*.
Conferences: *IWOCA 2011*, *IC3 2011*, *IWOCA 2012*, *IWOCA 2013*, *FCT 2013*, *COCOA 2013*, *IWOCA 2014*, *WALCOM 2015*, *IPEC 2018*, *WAOA 2018*, *WG 2018*, *FCT 2019*, *WALCOM 2020*.

• Member of the funded research projects:
–*IDEA: Identifying coDes in Evolving grAphs, ANR (PI: Ralf Klasing), 2009–2012* (`http://idea.labri.fr`)
–*Arbitrarily decomposable graphs, PHC Polonium (PI: Olivier Baudon), 2010–2012*
–*HOGRASI: HOmomorphismes de GRAphes SIgnés, PEPS CNRS (PI: Reza Naserasr), 2012–2013* (`http://www.irif.fr/~reza/pmwiki/pmwiki.php?n=Site.PEPS2013`)
–*IDIS: IdentificatIon dans les structures DIScrètes, PEPS CNRS (PI: Aline Parreau), 2015*
–*HOSIGRA: HOmomorphisms of SIgned GRAphs, ANR (PI: Reza Naserasr), 2018–2022* (`http://www.irif.fr/~hosigra/`)
–*AGraHom: Applications of Graph Homomorphisms*, IFCAM - Indo-French Center for Applied Mathematics (PI: Sagnik Sen), 2018–2021

Invited talks

02.2020 Indo-French pre-conference school of the 6th International Conference on Algorithms and Discrete Applied Mathematics (CALDAM'20), Hyderabad, Inde.
Identification problems on graphs: selected topics. Invited short lecture.

02.2020 International Conference on Emerging Trends in Mathematical Sciences & Computing (IEMSC-20), Calcutta, Inde.
Broadcast domination and multipacking in graphs. Invited talk.

06.2014 SIAM conference on Discrete Mathematics 2014, Minneapolis, USA.
The complexity of signed graph homomorphisms. Invited talk at the minisymposium MS6 - Graph Homomorphisms: Edge Colours, Signs, and Crossings

Selected international research visits

01.2019 +02.2020 (2 weeks.) Mathematics Department, Indian Institute of Technology Madras (Chennai, Inde).
Host: N. Narayanan.

02.2020 (1 sem.) Mathematics Department, Indian Institute of Technology Dharwad (Dharwad, Inde).
Host: Sagnik Sen.

02.2019 +02.2020 (4 weeks.) Computer Science Department, Indian Statistical Institute (Calcutta, Inde).
Host: Sandip Das.

11.2015 +12.2017 (8 weeks) Mathematics Department, Universidad Autonoma de Mexico (Querétaro, Mexico).
Host: Adriana Hansberg.

06.2014 +06.2016 (5 weeks) Mathematics Department, Thompson Rivers University, (Kamloops, Canada).
Host: Richard C. Brewster.

09.2012 +11.2013 (7 weeks) Algorithms and Complexity theory team, TU Berlin (Berlin, Germany).
Host: Rolf Niedermeier.

08.2011 (2 weeks) Foundations of Computing and Discrete Mathematics team, Turun Yliopisto (Turku, Finland).
Host: Tero Laihonen.

11.2010 (2 weeks) Department of Discrete Mathematics, Akademia Górniczno-Hutnicza w. Krakowie (Krakow, Poland).
Host:: Monika Pilsńiak, Mariusz Woźniak.

10.2009 (1 week) Department of Algorithms and System Modelling, Gdańsk University of Technology (Gdańsk, Poland).
Host: Adrian Kosowski.

Language skills

French, German: native speaker English: fluent Spanish: intermediate

Selected professional references

• Cristina Bazgan – Full Professor, LAMSADE, University of Paris-Dauphine
bazgan@lamsade.dauphine.fr
• Laurent Beaudou – Assistant Professor, LIMOS, Université Clermont Auvergne
beaudou@isima.fr
• Richard C. Brewster – Full Professor, Thomson Rivers University, Kamloops
rcbrewster@tru.ca
• Pavol Hell – Full Professor, Simon Fraser University, Vancouver
pavol@sfu.ca
• Michael A. Henning – Full Professor, University of Johannesburg
mahenning@uj.ac.za
• Ralf Klasing – Directeur de Recherche CNRS (Senior Researcher), LaBRI, Université de Bordeaux
ralf.klasing@labri.fr
• Reza Naserasr – Chargé de Recherche CNRS (Researcher), IRIF, Université Paris-Diderot
reza@lri.fr
• André Raspaud – Emeritus Professor, LaBRI, Université de Bordeaux
andre.raspaud@labri.fr
• Oriol Serra – Full Professor, Universitat Politècnica de Catalunya, Barcelona
oserra@ma4.upc.edu
• Éric Sopena – Full Professor, LaBRI, Université de Bordeaux
eric.sopena@labri.fr