



Jean-François Baffier, Ph.D.

Researcher, Software Developer, and Founder

*Researcher and software developer combining scientific depth,
technical leadership, and practical implementation.*

Technical expertise

Research fields	Combinatorial optimization, graph theory and algorithms, decision-making, scientific computing, interpretable AI, distributed computing, and memory-efficient data structures.
Software development	Architecture, algorithms, reusable libraries, APIs, testing, continuous integration, documentation, profiling, performance engineering, and open-source maintenance.
Main languages	Julia and C/C++, complemented by Python, JavaScript, HTML/CSS, SQL/graph databases, and $\text{\LaTeX}$.
Julia	Extensive experience across scientific packages, optimization frameworks, graph software, distributed and multithreaded computing, developer tooling, and production services.
Full-stack development	Web backends, REST/OpenAPI clients, data and content pipelines, messaging integrations, bots, and browser-facing applications.
Tools	Git, Linux, JuMP, CPLEX, Gurobi, continuous integration, and reproducible experimentation.

Professional and academic experience

2026–present	President & Co-founder , <i>Mirage Interactive</i> , Castelnau-le-Lez, France Company leadership and technical direction. Mirage Interactive was officially incorporated in June 2026.
2021–2025	Senior Researcher , <i>Internet Initiative Japan — Research Laboratory</i> , Tokyo, Japan Led work on a semi-automated optimization framework, cloud resource management, and network software.
2021	Assistant Professor , <i>The University of Tokyo</i> , Tokyo, Japan IBM Quantum Learning.
2020	Data Science Consultant , <i>Air360</i> , Remote Interpretable AI using SHAP for product quality analysis.
2019–2021	Postdoctoral Researcher , <i>RIKEN Center for Advanced Intelligence Project</i> , Tokyo, Japan Led research on information networks, large-scale optimization, and memory-efficient data structures.
2017–2019	International Research Fellow , <i>Japan Society for the Promotion of Science</i> , Tokyo, Japan Compressed data structures and information networks; hosted at Tokyo Institute of Technology.

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- 2015–2017 **Postdoctoral Researcher**, *National Institute of Informatics*, Tokyo, Japan
JST-ERATO Kawarabayashi Large Graph Project.
- 2012–2014 **Teaching Assistant**, *The University of Tokyo*, Tokyo, Japan
Graduate courses in algorithms and combinatorial search.
- 2009–2010 **Mathematics Teacher**, *French Ministry of Education*, France

Public software and research artifacts

- Network & cloud NetworkVisualizer.jl, NetworkVisualizer.js, and KuMo.jl.
- Optimization & algorithms The JuliaConstraints ecosystem, NetworkFlows.jl, and CompressedStacks.cpp.
- Julia tools & applications PerfChecker.jl, StaticWebPages.jl, Bibliography.jl, and ChatThemAll.jl.

Research contributions

- Optimization Constraint-based local search, interpretable error-function learning, QUBO model learning, composite solver architectures, and accessible optimization interfaces.
- Graphs and networks Robust and adaptive network flows, multilayer stream graphs, citation-network metrics, cloud resource allocation, and performance isolation.
- Data structures Time-space trade-offs, compressed stacks, external-memory algorithms, and practical evaluation under limited memory.
- Games and AI Complexity and algorithms for Hanabi and Skull & Roses; combinatorial optimization for real-time strategy problems.

Teaching

- The University of Tokyo Graduate teaching in fundamentals of algorithms and combinatorial search & AI.
- Invited lectures Network interdiction at École Polytechnique; Julia and optimization at the University of Évora; information networks at The University of Tokyo.

Education

- 2015 **Ph.D. in Information Science**, *The University of Tokyo*, Japan
Graphs, algorithms, and optimization.
- 2011 **Master of Research in Computer Science**, *Université Paris-Sud*, France
Mathematical programming.
- 2007 **B.Sc. in Computer Science and Mathematics**, *Université Paris-Sud*, France

Grants and fellowships

- 2017–2019 **JSPS-CNRS International Research Fellowship**, *KAKENHI 17F17727*, Japan
- 2012–2015 **MEXT Scholarship**, *The University of Tokyo*, Japan

Languages

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|------------|--------|----------|-----------------|
| French | Native | English | Business fluent |
| Portuguese | Fluent | Japanese | Conversational |

Peer-reviewed publications

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- [1] Ahmed Ben Ali, Yann Labit, Benoît Nougnanke, and Jean-François Baffier. “Protocol-to-Model Translation Framework: Enabling Mathematically Tractable TCP Models for Autonomic Controller Design”. In: *IEEE/ACM International Conference on Utility and Cloud Computing (UCC 2025)*. 2025, 17:1–17:10.
- [2] Khalil Chrit, Jean-François Baffier, Pedro Patinho, and Salvador Abreu. “An Architecture for Composite Combinatorial Optimization Solvers”. In: *Proceedings of the 14th Symposium on Languages, Applications and Technologies (SLATE 2025)*. 2025, 8:1–8:16. DOI: 10.4230/OASICS.SLATE.2025.8.
- [3] Benoît Nougnanke, Justin Loye, Jean-François Baffier, Simone Ferlin, Marc Bruyere, and Yann Labit. “gPerfIsol: GNN-Based Rate-Limits Allocation for Performance Isolation in Multi-Tenant Cloud”. In: *27th Conference on Innovation in Clouds, Internet and Networks (ICIN 2024)*. 2024, pp. 194–201. DOI: 10.1109/ICIN60470.2024.10494407.
- [4] Kenjiro Cho and Jean-François Baffier. “An Autonomous Resource Management Model towards Cloud Morphing”. In: *6th International Workshop on Edge Systems, Analytics and Networking (EdgeSys 2023)*. 2023, pp. 7–12. DOI: 10.1145/3578354.3592861.
- [5] Florian Richoux and Jean-François Baffier. “Automatic Cost Function Learning with Interpretable Compositional Networks”. In: *(to appear) Proceedings of the 2021 Genetic and Evolutionary Computation Conference Companion*. New York, NY, USA: Association for Computing Machinery, 2021.
- [6] Jean-François Baffier and Benjamin Renoust. “Decycling Information Networks”. In: *(to appear) Applied Network Science Special Issue on Global Flow of Commodity, Money, Human, and Knowledge* (2020).
- [7] Pimprenelle Parmentier, Tiphaine Viard, Benjamin Renoust, and J-F Baffier. “Introducing multilayer stream graphs and layer centralities”. In: *International Conference on Complex Networks and Their Applications*. Springer. 2019, pp. 684–696.
- [8] Sang Won Bae, Jean-François Baffier, Jinhee Chun, Peter Eades, Kord Eickmeyer, Luca Grilli, Seok-Hee Hong, Matias Korman, Fabrizio Montecchiani, Ignaz Rutter, and Csaba D. Tóth. “Gap-planar graphs”. In: *Theoretical Computer Science* (2018). DOI: <https://doi.org/10.1016/j.tcs.2018.05.029>.
- [9] Jean-François Baffier, Yago Diez, and Matias Korman. “Experimental Study of Compressed Stack Algorithms in Limited Memory Environments”. In: *17th International Symposium on Experimental Algorithms (SEA 2018)*. Ed. by Gianlorenzo D’Angelo. Vol. 103. Leibniz International Proceedings in Informatics (LIPIcs). Dagstuhl, Germany: Schloss Dagstuhl–Leibniz-Zentrum fuer Informatik, 2018, 19:1–19:13. DOI: 10.4230/LIPIcs.SEA.2018.19.
- [10] Jean-François Baffier, Pierre-Louis Poirion, and Vorapong Suppakitpaisarn. “Bilevel Model for Adaptive Network Flow Problem”. In: vol. 64. 8th International Network Optimization Conference - INOC 2017. 2018, pp. 105–114. DOI: 10.1016/j.endm.2018.01.012.
- [11] Jean-François Baffier, Man-Kwun Chiu, Yago Diez, Matias Korman, Valia Mitsou, André van Renssen, Marcel Roeloffzen, and Yushi Uno. “Hanabi is np-hard, even for cheaters who look at their cards”. In: *Theoretical Computer Science* 675 (2017), pp. 43–55.
- [12] Benjamin Renoust, Vivek Claver, and Jean-François Baffier. “Flows of Knowledge in Citation Networks”. In: *Complex Networks & Their Applications V*. Cham: Springer International Publishing, 2017, pp. 159–170. ISBN: 978-3-319-50901-3.
- [13] Benjamin Renoust, Vivek Claver, and Jean-François Baffier. “Multiplex flows in citation networks”. In: *Applied Network Science* 2.1 (July 2017), p. 23. DOI: 10.1007/s41109-017-0035-2.
- [14] Jean-François Baffier, Man-Kwun Chiu, Yago Diez, Matias Korman, Valia Mitsou, André van Renssen, Marcel Roeloffzen, and Yushi Uno. “Hanabi is NP-complete, Even for Cheaters who Look at Their Cards”. In: *8th International Conference on Fun with Algorithms, FUN 2016, June 8-10, 2016, La Maddalena, Italy*. 2016, 4:1–4:17. DOI: 10.4230/LIPIcs.FUN.2016.4.

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- [15] Jean-François Baffier, Yago Diez, and Matias Korman. “Implementation of Stack Structure with Limited Memory”. In: The 9th Annual Meeting of Asian Association For Algorithms and Computation, Taipei, Taiwan. 2016.
- [16] Jean-François Baffier, Vorapong Suppakitpaisarn, Hidefumi Hiraishi, and Hiroshi Imai. “Parametric multiroute flow and its application to multilink-attack network”. In: *Discrete Optimization* (2016). DOI: 10.1016/j.disopt.2016.05.002.
- [17] Florian Richoux, Alberto Uriarte, and Jean-François Baffier. “GHOST: A Combinatorial Optimization Framework for RTS-related Problems”. In: *IEEE Transactions on Computational Intelligence and AI in Games* PP.99 (2016), pp. 1–1. DOI: 10.1109/TCIAIG.2016.2573199.
- [18] Jean-François Baffier and Vorapong Suppakitpaisarn. “Algorithms for finding robust and sustainable network flows against multilink-attack”. In: *7th International Workshop on Reliable Networks Design and Modeling, RNDM 2015, Munich, Germany, October 5-7, 2015*. 2015, pp. 251–258. DOI: 10.1109/RNDM.2015.7325237.
- [19] Alonso Gragera Aguaza, Jean-François Baffier, and Vorapong Suppakitpaisarn. “Skull and Roses Card Game”. In: *Encyclopedia of Computer Graphics and Games*. Ed. by Newton Lee. Cham: Springer International Publishing, 2015, pp. 1–4. DOI: 10.1007/978-3-319-08234-9_19-1.
- [20] Vorapong Suppakitpaisarn and Jean-François Baffier. “Speeding up algorithm for maximizing barrier coverage using parametric multiroute flow”. In: *IEICE Communications Express* 4.4 (2015), pp. 111–116. DOI: 10.1587/comex.4.111.
- [21] Vorapong Suppakitpaisarn, Wenkai Dai, and Jean-François Baffier. “Robust network flow against attackers with knowledge of routing method”. In: *16th IEEE International Conference on High Performance Switching and Routing, HPSR 2015, Budapest, Hungary, July 1-4, 2015*. 2015, pp. 40–47. DOI: 10.1109/HPSR.2015.7483079.
- [22] Jean-François Baffier and Vorapong Suppakitpaisarn. “A $(k + 1)$ -Approximation Robust Network Flow Algorithm and a Tighter Heuristic Method Using Iterative Multiroute Flow”. In: *Algorithms and Computation - 8th International Workshop, WALCOM 2014, Chennai, India, February 13-15, 2014, Proceedings*. 2014, pp. 68–79. DOI: 10.1007/978-3-319-04657-0_9.
- [23] Jean-François Baffier, Vorapong Suppakitpaisarn, Hidefumi Hiraishi, and Hiroshi Imai. “Parametric Multiroute Flow and Its Application to Robust Network with k Edge Failures”. In: *Combinatorial Optimization - Third International Symposium, ISCO 2014, Lisbon, Portugal, March 5-7, 2014, Revised Selected Papers*. 2014, pp. 26–37. DOI: 10.1007/978-3-319-09174-7_3.