Guilherme Dias da Fonseca

Curriculum Vitæ

Date of birth:	May 11, 1978
Place of birth:	Rio de Janeiro, Brazil
Nationality:	Brazilian
Position:	Maître de conférences in Computer Science (Section 27)
University:	Université Clermont Auvergne
	IUT d'informatique
	5 avenue Blaise Pascal, Aubière, France
E-mail:	fonseca@isima.fr
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Specializations: Computational geometry, algorithms, data structures, mathematics for computer science, discrete geometry, graphs, approximation

Teaching and Research Experience

2017 – 2018: **Visiting researcher (Délégation)**
INRIA, Sophia Antipolis, France
Team: Datashaper (former Geometrica)
Director: Jean-Daniel Boissonnat

2015 – present: **Associate Professor (Maître de conférences)**
Université Clermont Auvergne and LIMOS, France
Classes taught (500 hours): *Algorithms and Data Structures, Distributed Algorithms, Mathematics for Computer Science, Documents and Interfaces*

2014 – 2015: **Temporary Professor (ATER)**
Université Montpellier 2 and LIRMM, France
Classes taught (100 hours): *Imperative Programming; Algorithms and Complexity*

2009 – 2012: **Associate Professor (Professor adjunto)**
Universidade Federal do Estado do Rio de Janeiro, Brazil
Classes taught (900 hours): *Complexity of Algorithms, Formal Languages and Automata, Probability, Computer Graphics, Data Structures, Introduction to Programming*

2008 – 2009: **Postdoctoral Scholar**
Universidade Federal do Rio de Janeiro, Brazil
Classes taught (200 hours): *Complexity of Algorithms, Computational Geometry, Data Structures*

2006 (summer): **Instructor**
University of Maryland, USA
Class taught (48 hours): *Organization of Programming Languages*

2003 – 2007: **Teaching Assistant**
University of Maryland, USA
Classes: *Algorithms, Computational Geometry, Data Structures, Organization of Programming Languages*

Education

2008 – 2009: **Postdoctoral Scholar**
UNIVERSIDADE FEDERAL DO RIO DE JANEIRO, BRAZIL
Advisor: Celina M. H. de Figueiredo

2003 – 2007: **Ph.D. in Computer Science**
UNIVERSITY OF MARYLAND, USA
Advisor: David M. Mount
Dissertation: *Approximate Range Searching in the Absolute Error Model*

2001 – 2003: **Master Degree in Computer Science**
UNIVERSIDADE FEDERAL DO RIO DE JANEIRO, BRAZIL
Advisor: Celina M. H. de Figueiredo
Thesis: *Kinetic Priority Queues*

1996 – 2000: **Bachelor Degree in Computer Science**
UNIVERSIDADE FEDERAL DO RIO DE JANEIRO, BRAZIL
Advisor: Celina M. H. de Figueiredo
Final project: *The Stable Marriage Problem with Forbidden Pairs*

Journal Papers

[1] Sunil Arya, Guilherme D. da Fonseca, and David M. Mount. Approximate polytope membership queries. *SIAM Journal on Computing*, 47(1):1–51, 2018.

[2] Sunil Arya, Guilherme D. da Fonseca, and David M. Mount. On the combinatorial complexity of approximating polytopes. *Discrete and Computational Geometry*, 58(4):849–870, 2017.

[3] Guilherme D. da Fonseca, Vinícius G. P. de Sá, and Celina M. H. de Figueiredo. Shifting coresets: Obtaining linear-time approximations for unit disk graphs and other geometric intersection graphs. *International Journal of Computational Geometry and Applications*, 27(4):255–276, 2017.

[4] Guilherme D. da Fonseca, Diana Sasaki, and Bernard Ries. On the ratio between perfect matchings and maximum weight matchings of grids. *Discrete Applied Mathematics*, 207:45–55, 2016.

[5] Emilio Vital Brazil, Guilherme D. da Fonseca, Celina M. H. de Figueiredo, and Diana Sasaki. The cost of perfection for matchings in graphs. *Discrete Applied Mathematics*, 210:112–122, 2016.

[6] Guilherme D. da Fonseca, Vinícius G. P. de Sá, Raphael Machado, and Celina M. H. de Figueiredo. On the recognition of unit disk graphs and the distance geometry problem with ranges. *Discrete Applied Mathematics*, 197:3–19, 2015.

[7] Guilherme D. da Fonseca, Vinícius G. P. de Sá, Celina M. H. de Figueiredo, and Raphael Machado. Efficient sub-5 approximations for minimum dominating sets in unit disk graphs. *Theoretical Computer Science*, 540–541(5):70–81, 2014.

[8] Guilherme D. da Fonseca. Fitting flats to points with outliers. *International Journal of Computational Geometry and Applications*, 21(5):559–569, 2011.

[9] Vinícius G. P. de Sá, Celina M. H. de Figueiredo, Guilherme D. da Fonseca, and Raphael Machado. Complexity dichotomy on partial grid recognition. *Theoretical Computer Science*, 412(22):2370–2379, 2011.

[10] Guilherme D. da Fonseca and David M. Mount. Approximate range searching: The absolute model. *Computational Geometry*, 43(4):434–444, 2010.

[11] Celina M. H. de Figueiredo and Guilherme D. da Fonseca. Enclosing weighted points with an almost-unit ball. *Information Processing Letters*, 109(21-22):1216–1221, 2009.

[12] Letícia R. Bueno, Luerbio Faria, Celina M. H. de Figueiredo, and Guilherme D. da Fonseca. Hamiltonian paths in odd graphs. *Applicable Analysis and Discrete Mathematics*, 3(2):386–394, 2009.

[13] Celina M. H. de Figueiredo, Guilherme D. da Fonseca, Vinicius G. P. de Sá, and Jeremy Spinrad. Algorithms for the homogeneous set sandwich problem. *Algorithmica*, 46(2):149–180, 2006.

[14] Guilherme D. da Fonseca, Celina M. H. de Figueiredo, and Paulo C. P. Carvalho. Kinetic hanger. *Information Processing Letters*, 89(3):151–157, 2004.

[15] Vânia M. F. Dias, Guilherme D. da Fonseca, Celina M. H. de Figueiredo, and Jayme L. Szwarcfiter. The stable marriage problem with restricted pairs. *Theoretical Computer Science*, 306(1-3):391–405, 2003.

[16] Guilherme D. da Fonseca and Celina M. H. de Figueiredo. Kinetic heap-ordered trees: Tight analysis and improved algorithms. *Information Processing Letters*, 85(3):165–169, 2003.

Conference Papers

[17] Sunil Arya, Guilherme D. da Fonseca, and David M. Mount. Near-optimal ε-kernel construction and related problems. In *International Symposium on Computational Geometry (SoCG)*, pages 10:1–15, 2017.

[18] Sunil Arya, Guilherme D. da Fonseca, and David M. Mount. Optimal approximate polytope membership. In *ACM-SIAM Symposium on Discrete Algorithms (SODA)*, pages 270–288, 2017.

[19] Sunil Arya, Guilherme D. da Fonseca, and David M. Mount. On the combinatorial complexity of approximating polytopes. In *International Symposium on Computational Geometry (SoCG)*, pages 11:1–15, 2016.

[20] Guilherme D. da Fonseca, Vinícius G. P. de Sá, and Celina M. H. de Figueiredo. Linear-time approximation algorithms for unit disk graphs. In *Approximation and Online Algorithms (WAOA)*, volume 8952 of *Lecture Notes in Computer Science*, pages 132–143, 2015.

[21] Guilherme D. da Fonseca, Vinícius G. P. de Sá, Celina M. H. de Figueiredo, and Raphael Machado. Linear time approximation for dominating sets and independent dominating sets in unit disk graphs. In *Approximation and Online Algorithms (WAOA)*, volume 7846 of *Lecture Notes in Computer Science*, pages 82–92, 2013.

[22] Sunil Arya, Guilherme D. da Fonseca, and David M. Mount. Optimal area-sensitive bounds for polytope approximation. In *ACM Symposium on Computational Geometry (SoCG)*, pages 363–372, 2012.

[23] Sunil Arya, Guilherme D. da Fonseca, and David M. Mount. Polytope approximation and the Mahler volume. In *ACM-SIAM Symposium on Discrete Algorithms (SODA)*, pages 29–42, 2012.

[24] Sunil Arya, Guilherme D. da Fonseca, and David M. Mount. Approximate polytope membership queries. In *ACM Symposium on Theory of Computing (STOC)*, pages 579–586, 2011.

[25] Sunil Arya, Guilherme D. da Fonseca, and David M. Mount. A unified approach to approximate proximity searching. In *European Symposium on Algorithms (ESA)*, volume 6346 of *Lecture Notes in Computer Science*, pages 374–385, 2010.

[26] Vinícius G. P. de Sá, Celina M. H. de Figueiredo, Guilherme D. da Fonseca, and Raphael Machado. Complexity dichotomy on degree-constrained vlsi layouts with unit-length edges. In *International Symposium on Combinatorial Optimization (ISCO)*, volume 36 of *Electronic Notes in Discrete Mathematics*, pages 391–398, 2010.

[27] Sunil Arya, Guilherme D. da Fonseca, and David M. Mount. Tradeoffs in approximate range searching made simpler. In *Symposium on Computer Graphics and Image Processing (SIBGRAPI)*, IEEE, pages 237–244, 2008.

[28] Guilherme D. da Fonseca. Approximate range searching: The absolute model. In *Algorithms and Data Structures (WADS)*, volume 4619 of *Lecture Notes in Computer Science*, pages 2–14, 2007.

[29] Celina M. de Figueiredo, Guilherme D. da Fonseca, Vinícius G. de Sá, and Jeremy Spinrad. Faster deterministic and randomized algorithms on the homogeneous set sandwich problem. In *Experimental and Efficient Algorithms (WEA)*, pages 243–252, 2004.