

# Luis Gustavo Nonato

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## Areas of Interest

Visualization, Visual Analytics, Data Science, Urban Data Analysis,  
Machine Learning, Geometry Processing.

## Links

ResearcherID: D-5782-2011

Citations: <http://scholar.google.com/citations?user=p2tLSUsAAAAJ>

## EDUCATION

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1991	Bachelor Degree in Mathematics	Universidade Estadual Paulista - UNESP
1994	Master in Applied Mathematics	Pontifícia Universidade Católica do Rio de Janeiro
1998	Doctorate in Applied Mathematics	Pontifícia Universidade Católica do Rio de Janeiro
2008–2009	Post-doctorate	Scientific Computing and Imaging Institute - University of Utah

## PROFESSIONAL EXPERIENCE

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1998–1999	Pontifícia Universidade Católica do Rio de Janeiro	Assistant Professor
1999–2006	University of São Paulo Inst. of Mathematical and Computer Sciences	Assistant Professor
2006–2012	University of São Paulo - ICMC - USP Inst. of Mathematical and Computer Sciences	Associate Professor
2009–2010	University of Utah Scientific Computing and Imaging Institute	Visiting Scholar
2015–	University of São Paulo Inst. of Mathematical and Computer Sciences	Full Professor
2016–2018	New York University Center for Data Science	Visiting Professor

## MAJOR ADMINISTRATIVE POSITIONS

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10/2013–10/2015	Head of the Dept. of Applied Mathematics and Statistics - ICMC-USP
11/2015–10/2016	Coordinator of the Industrial Master Graduate Program - MECAI/ICMC-USP
10/2011–09/2013	President of the Special Committee on Computer Graphics and Image Processing, Brazilian Computer Society

## HONORS

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### *Paper Award*

- Honorable Mention - Sibgrapi, 2017
- Honorable Mention - Sibgrapi, 2016
- Honorable Mention - Sibgrapi, 2015
- Best paper award - Sibgrapi 2013
- Best paper award - Sibgrapi 2012
- Best paper award - Sibgrapi 2011
- Best paper award - PacificVis 2011
- Honorable Mention - IEEE Information Visualization 2011

### *Students Award*

- Erick Gomez-Nieto - Best PhD dissertation, WTD - Sibgrapi, 2017
- Wallace Casaca - Best Dissertation of the University of São Paulo in Exact and Earth Sciences, 2016
- Wallace Casaca - Odelar Leite Linhares Ward - Brazilian Society of Computational and Applied Mathematics, 2016
- Wallace Casaca - Honorable Mention PhD dissertation - Capes PhD Dissertation Contest in Computer Science, 2015
- Wallace Casaca - Best PhD dissertation - Latin America PhD dissertations Contest (CLEI CLTD), 2015
- Paulo Joia Filho - Finalist of the Brazilian Computer Society Dissertation Contest, 2016
- Evandro Ortigossa - Best Undergraduate Work, WUW - Sibgrapi, 2015
- Helton H. Biscaro - Best PhD dissertation, WTD - Sibgrapi, 2005

## PUBLICATIONS<sup>1</sup>

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*Peer-reviewed Journal Publications* (19 TVCG papers, 8 CGF papers, 2 TOG papers)

1. G. Chan, L.G. Nonato, A. Chu, P. Raghavan, V. Aluru, C.T. Silva. Motion Browser: Visualizing and Understanding Complex Upper Limb Movement Under Obstetrical Brachial Plexus Injuries, *IEEE Trans. on Vis. and Comp. Graph.*, 26(20):981-990, 2020.
2. G.G Zanabria, J. Silveira, J. Poco, A. Paiva, M. Nery, C.T. Silva, S. Adorno, L.G. Nonato. CrimAnalyzer: Understanding Crime Patterns in São Paulo, *IEEE Trans. on Vis. and Comp. Graph.*, (pre-print), 2019.
3. E.C. Alexandrina, E.S. Ortigossa, E.S. Lui, J.S. Goncalves, N.A. Correa, L.G. Nonato, and M.L. Aguiar. Analysis and visualization of multidimensional time series: Particulate matter (PM10) from Sao Carlos-SP (Brazil), *Atmospheric Pollution Research*, 10(4):1299-1311, 2019.
4. L.G. Nonato and M. Aupetit. Multidimensional Projection for Visual Analytics: Linking Techniques with Distortions, Tasks, and Layout Enrichment, *IEEE Trans. on Vis. and Comp. Graph.*, 25(8):2650-2673, 2018.
5. A. Dal Col, P. Valdivia, F. Petronetto, F. Dias, C.T. Silva, L.G. Nonato. Wavelet-based Visual Analysis of Dynamic Networks, *IEEE Trans. on Vis. and Comp. Graph.*, 24(8):2456-2469, 2018.
6. M.D. Ferreira, D.C. Correa, L.G. Nonato, RF de Mello. Designing architectures of convolutional neural networks to solve practical problems, *Expert Systems with Applications*, 94:205–217, 2018.

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<sup>1</sup>The three major venues for publishing research in computer graphics and visualization are ACM Trans. on Graphics (TOG), IEEE Trans. on Visualization and Computer Graphics (TVCG), and Computer Graphics Forum (CGF). IEEE TVCG and CGF have become the two leading journals for visualization, publishing, for more than a decade, the proceedings of the two major visualization conferences, IEEE VIS and EuroVis. Papers in IEEE VIS and EuroVis are rigorously reviewed, with acceptance rates ranging from 17% - 27% (depending on the year).

7. A. Sagrista, S. Jordan, A. Just, F. Dias, L.G. Nonato, F. Sadlo Topological Analysis of Inertial Dynamics, *IEEE Trans. on Vis. and Comp. Graph. (IEEE Vis)*, 23(1):950–959, 2017.
8. A. Dal Col, P. Valdivia, F. Petronetto, F. Dias, C.T. Silva, L.G. Nonato. Wavelet-Based Visual Analysis for Data Exploration, *Computing in Science & Engineering*, 19(5):85–91, 2017.
9. A. Barbosa, F. Paulovich, A. Paiva, S. Goldenstein, F. Petronetto, L.G. Nonato. Visualizing and Interacting with Kernelized Data, *IEEE Trans. on Vis. and Comp. Graph.*, 22:1314–1325, 2016.
10. E. Gomez, W. Casaca, D. Coimbra, I. Hartmann, G. Taubin, L.G. Nonato. Dealing with Multiple Requirements in Geometric Arrangements, *IEEE Trans. on Vis. and Comp. Graph.*, 22:1223–1235, 2016.
11. M. Sandim, D. Cedrim, L.G. Nonato, P. Pagliosa and A. Paiva. Boundary detection in particle-based fluids, *Computer Graphics Forum (Eurographics)*, 35(2):215–224, 2016.
12. G.D. Cantareira, L.G. Nonato, F.V. Paulovich. MoshViz: A Detail+ Overview approach to visualize music elements, *IEEE Trans. on Multimedia*, 18(11):2238–2246, 2016.
13. M.D. Ferreira, D.C. Correa, M.A. Grivet, G. Tavares, R.F. de Mello, L.G. Nonato. On Accuracy and Time Processing Evaluation of Cover Song Identification Systems, *Journal of New Music Research*, 45(4):333–342, 2016.
14. G.G. Zanabria, L.G. Nonato, E. Gomez-Nieto. iStar (i\*): An interactive star coordinates approach for high-dimensional data exploration, *Computers & Graphics*, 60:107–118, 2016
15. D. Cedrim, V. Vad, A. Paiva, M.E. Groller, L.G. Nonato, A. Castelo. Depth functions as a quality measure and for steering multidimensional projections, *Computers & Graphics* , 60:93–106, 2016.
16. P. Joia, F. Petronetto, L.G. Nonato. Uncovering Representative Groups in Multidimensional Projections, *Computer Graphics Forum (EuroVis)*, 34:281–290, 2015.
17. E. Amorim, E.V. Brazil, J. Mena-Chalco, L. Velho, L.G. Nonato, F. Samavati, M.C. Sousa. Facing the high-dimensions: Inverse projection with radial basis functions, *Computers & Graphics*, 48:35–47, 2015.
18. P. Pagliosa, F.V. Paulovich, R. Minghim, H. Levkowitz, L.G. Nonato. Projection Inspector: Assessment and Synthesis of Multidimensional Projections, *Neurocomputing*, 150:599–610, 2015.
19. L.F. Silva, L.F. Scheidegger, T. Etienne, J. Comba, L.G. Nonato, C.T. Silva. A Weighted Delaunay Triangulation Framework for Merging Triangulations in a Connectivity Oblivious Fashion. *Computer Graphics Forum* 3(6):18–30, 2014.
20. T. Etienne, D. Jonsson, T. Ropinski, C. Scheidegger, J. Comba, L.G. Nonato, M.K. Kirby, A. Ynnerman, C.T. Silva. Verifying Volume Rendering Using Discretization Error Analysis, *IEEE Trans. on Vis. and Comp. Graph.*, 20(1):140–154, 2014.
21. E. Gomez-Nieto, F. San Roman, P. Pagliosa, W. Casaca, E. Helou, M.C.F. de Oliveira, L.G. Nonato. Similarity Preserving Snippet-Based Visualization of Web Search Results, *IEEE Trans. on Vis. and Comp. Graph.*, 20(3):457–470, 2014.
22. W. Casaca, M. Boaventura, M.P. de Almeida, L.G. Nonato. Combining anisotropic diffusion, transport equation and texture synthesis for inpainting textured images, *Pattern Recognition Letters*, 15:36–45, 2014.
23. W. Casaca, A. Paiva, E. Gomez-Nieto, P. Joia, L.G. Nonato. Spectral Image Segmentation using Image Decomposition and Inner Product-based metric, *Journal of Mathematical Imaging and Vision*, 45:(3)227–238, 2013.
24. M. Berger, J. Levine, L.G. Nonato, G. Taubin, C.T. Silva. A Benchmark for Surface Reconstruction, *ACM Trans. on Graphics*, 32(2), 20:1–20:17, 2013.
25. F. Petronetto, A. Paiva, E.S. Helou, D. Stewart, L.G. Nonato. Mesh-Free Discrete Laplace-Beltrami Operator, *Computer Graphics Forum*, 32(6):214–226, 2013.
26. G.M.H. Mamani, L.G. Nonato, F.V. Paulovich. User-Driven Feature Space Transformation, *Computer Graphics Forum (EuroVis)*, 32(3pt3):291–299, 2013.
27. F.V. Paulovich, F.M.B. Toledo, G.P. Telles, R. Minghim, L.G. Nonato. Semantic Wordification of Document Collections, *Computer Graphics Forum (EuroVis)*, 31(3pt3):1145–1153, 2012.

28. F. Paulovich, C. Silva, L.G. Nonato. User-Centered Multidimensional Projection Techniques *Computing in Science and Engineering*, 14:74–81, 2012.
29. P. Joia, E. Gomez-Nieto, J. Batista Neto, W. Casaca, G. Botelho, A. Paiva, L.G. Nonato. Class-specific metrics for multidimensional data projection applied to CBIR, *The Visual Computer*, 28:1027–1037, 2012.
30. J. Tierny, J. Daniels, L.G. Nonato, V. Pascucci, C.T. Silva. Interactive Quadrangulation with Reeb Atlases and Connectivity Textures, *IEEE Trans. on Vis. and Comp. Graph.*, 18(10):1650–1663, 2012.
31. T. Etienne, L.G. Nonato, C. Scheidegger, J. Tierny, T.J. Peters, V. Pascucci, R.M. Kirby, C.T. Silva. Topology Verification for Isosurface Extraction, *IEEE Trans. on Vis. and Comp. Graph.*, 18(6):952–965, 2012.
32. H. Bhatia, S. Jadhav, P.-T. Bremer, G. Chen, J. Levine, L.G. Nonato, V. Pascucci. Flow Visualization with Quantified Spatial and Temporal Errors using Edge Maps, *IEEE Trans. on Vis. and Comp. Graph.*, 18(9):1383–1396, 2012.
33. P. Joia, F. Paulovich, D. Coimbra, J.A. Cuminato, L.G. Nonato. Local Affine Multidimensional Projection, *IEEE Trans. on Vis. and Comp. Graph. (IEEE Vis)*, 17(12):2563–2571, 2011.  
**Honorable Mention Award**
34. J. Tierny, J. Daniels, L.G. Nonato, C.T. Silva, V. Pascucci. Inspired Quadrangulation, *Computer-Aided Design (SIAM Conf. Geom. Phys. Model. - SPM'11)*, 43:1516–1526, 2011.
35. M.A.S. Lizier, M. Siqueira, J. Daniels, C. Silva, L.G. Nonato. Template-Based Quadrilateral Mesh Generation from Imaging Data, *The Visual Computer*, 27:887–903, 2011.
36. F. Paulovich, D.M. Eler, J. Poco, C.P. Botha, R.Minghim and L.G. Nonato. Piecewise Laplacian-based Projection for Interactive Large Data Exploration and Organization, *Computer Graphics Forum (EuroVis)*, 30(3):1091–1100, 2011.
37. J. Daniels, M.A.S. Lizier, M. Siqueira, C. Silva, L.G. Nonato. Template-based Quadrilateral Meshing, *Computers & Graphics (Shape Modeling Intern)*, 35(3):471–482, 2011.
38. C. Tuttle, L.G. Nonato, and C.T. Silva. A Structured, Space Efficient Technique for Pedigree Visualization, *IEEE Trans. on Vis. and Comp. Graph. (IEEE Vis)*, 16(6):1063–1072, 2010.
39. J. Daniels, E. Anderson, L.G. Nonato, and C. Silva. Interactive Vector Field Feature Identification, *IEEE Trans. on Vis. and Comp. Graph. (IEEE Vis)*, 16(6):1560–1568, 2010.
40. F. Paulovich, C. Silva, and L.G. Nonato. Two-Phase Mapping for Projecting Massive Data Sets, *IEEE Trans. on Vis. and Comp. Graph. (IEEE Vis)*, 16(6):1281–1290, 2010.
41. M. Berger, L.G. Nonato, V. Pascucci, and C. Silva. Fiedler Trees for Multiscale Surface Analysis, *Computers & Graphics (Shape Modeling Intern.)*, 34(3):272–281, 2010.
42. A.J. Cuadros-Vargas, M.A.S. Lizier, R. Minghim, L.G. Nonato. Generating Segmented Quality Meshes from Images, *Journal of Mathematical Imaging and Vision*, 33(1):11–23, 2009.
43. M. Siqueira, D. Xu, J. Gallier, L.G. Nonato, D.M. Morera, L. Velho. A New Construction of Smooth Surfaces from Triangle Meshes Using Parametric Pseudo-Manifolds, *Computers & Graphics (Shape Modeling Intern.)*, 33(3):331–340, 2009.
44. M.A.S. Lizier, D.C. Martins-Jr, A.J. Cuadros-Vargas, R.M. Cesar-Jr, and L.G. Nonato. Generating segmented meshes from textured color images, *J. Vis. Comun. Image Represent.*, 20(3):190–203, 2009.
45. A. Gyulassy, L.G. Nonato, P.-T. Bremer, C. Silva, V. Pascucci. Robust Topology-based Multiscale Analysis of Scientific Data, *Computing in Science and Engineering*, 11(5):88–95, 2009.
46. T. Etienne, C. Scheidegger, L.G. Nonato, R.M. Kirby, C.T. Silva. Verifiable Visualization for Isosurface Extraction, *IEEE Trans. on Vis. and Comp. Graph. (IEEE Vis)*, 15(6):1077–2626, 2009.
47. J.P. Gois, A.L. Nakano, L.G. Nonato, G. Buscaglia. Front tracking with moving-least-squares surfaces, *Journal of Computational Physics*, 227(22):9643–9669, 2008.
48. J.P. Gois, V. Polizelli, T. Etienne, E. Tejada, A. Castelo, L.G. Nonato, T. Ertl. Twofold adaptive partition of unity implicits, *The Visual Computer*, 24(12):1013–1023, 2008.

49. O. Bruno, L.G. Nonato, M.A. Pazoti, J. Batista. Topological multi-contour decomposition for image analysis and image retrieval, *Pattern Recognition Letters*, 29(11):1675–1683, 2008.
50. L.G. Nonato, M.A.S. Lizier, J. Batista, M.C.F. Oliveira, A. Castelo. Topological Triangle Characterization with Application to Object Detection from Images, *Image and Vision Computing*, 26(8):1081–1093, 2008.
51. K.C. Estacio, L.G. Nonato, N. Mangiavacchi, G.F. Carey. Combining CVFEM and meshless front-tracking in Hele-Shaw mold filling simulation, *International Journal for Numerical Methods in Fluids*, 56:1217–1223, 2008.
52. F.V. Paulovich, L.G. Nonato, R. Minghim, H. Levkowitz. Least Square Projection: a fast high precision multidimensional projection technique and its application to document mapping, *IEEE Trans. on Vis. and Comp. Graph.*, 14:564–575, 2008.
53. H.H. Biscaro, A. Castelo, L.G. Nonato, M.C.F. Oliveira. A Topological Approach for Surface Reconstruction from Sample Points, *The Visual Computer*, 23:793–801, 2007.
54. F.S. Sousa, A. Castelo, L.G. Nonato, N. Mangiavacchi, J.A. Cuminato. Local Volume-Conserving Free Surface Smoothing, *Communications in Numerical Methods in Engineering*, 23:109–120, 2007.
55. A. Castelo, L.G. Nonato, M. Siqueira, R. Minghim, G. Tavares. The J1a Triangulation: an adaptive triangulation in any dimension, *Computers & Graphics*, 30(5):737–753, 2006.
56. L.G. Nonato, A.J. Cuadros-Vargas, R. Minghim, M.C.F. Oliveira. Beta-Connection: Generating a Family of Models from Planar Cross Sections, *ACM Trans. on Graphics* 24(4):1239–1258, 2005.
57. L.G. Nonato, A. Castelo, J.E.P.P. de Campos, H.H. Biscaro, R. Minghim. Topological Tetrahedron Characterization with Application in Volume Reconstruction, *International Journal of Shape Modeling* 11(2):189–216, 2005.
58. L.G. Nonato, A. Castelo, R. Minghim, J.E.S. Batista. Morse Operators for Digital Planar Surfaces and their Application to Image Segmentation, *IEEE Trans. on Image Processing*, 13(2):216–227, 2004.
59. F.S. de Sousa, N. Mangiavacchi, L.G. Nonato, A. Castelo, M.F. Tome, V.G. Ferreira, J.A. Cuminato, S. McKee. A Front-tracking Front-capturing Method for the Simulation of 3D Multi-fluid Flows with Free Surfaces, *Journal of Computational Physics*, 198(2):469–499, 2004.
60. E. Tejada-Gamero, R. Minghim, L.G. Nonato. On Improved Projection Techniques to Support Visual Exploration of Multi-Dimensional Data Sets, *Information Visualization*, 2(4):218–231, 2003.
61. L.G. Nonato, R. Minghim, M.C.F. Oliveira, G. Tavares. A Novel Approach for Delaunay 3D Reconstruction with a Comparative Analysis in the Light of Applications, *Computer Graphics Forum*, 20(2):161–174, 2001.
62. L.G. Nonato, R. Minghim, M.H. Shimabukuro. Qualitative Analysis of two Reconstruction Techniques and their Application Denstistry, *Journal of Electronic Imaging*, 9(4):385–393, 2000.

*Peer-reviewed Conference Publications*

1. P. Valdivia, F. Dias, F. Petronetto, C.T. Silva, L.G. Nonato. Wavelet-based visualization of time-varying data on graphs, *IEEE Conf. on Vis. Analytics Sci. Tech. (VAST)*, pp. 1–8, 2015.
2. W. Casaca, D. Motta, G. Taubin, L.G. Nonato. A user-friendly interactive image inpainting framework using laplacian coordinates, *IEEE Intern. Conf.on Image Processing (ICIP)*, 862–866, 2015.
3. W. Casaca, M. Colnago, L.G. Nonato. Interactive image colorization using Laplacian coordinates, *Intern. Conf. on Computer Analysis of Images and Patterns (CAIP)*, 675–686, 2015.
4. W. Casaca, L.G. Nonato, G. Taubin. Laplacian Coordinates for Seeded Image Segmentation, *IEEE Conf.e on Computer Vision and Pattern Recognition (CVPR)*, 384–391, 2014.
5. E.P.S. Amorim, E.V. Brazil, L.G. Nonato, F. Samavati, M.C. Sousa. Multidimensional Projection with Radial Basis Function and Control Points Selection, *IEEE Pacific Visualization Symposium (Pacific Vis)*, pp. 209–216, 2014.

6. E.P.S. Amorim, E. Brazil, J. Daniels, P. Joia, L.G. Nonato, M.C. Sousa. iLAMP: Exploring High-Dimensional Spacing through Backward Multidimensional Projection, *IEEE Conf. on Vis. Analytics Sci. Tech. (VAST)*, pp. 53–62, 2012.
  7. H. Bhatia, S. Jadhav, P.-T. Bremer, G. Chen, J. Levine, L.G. Nonato, V. Pascucci. Edge Maps: Representing Flow with Bounded Error. *IEEE Pacific Visualization Symposium (Pacific Vis)*, pp. 75-82, 2011.
- Best Paper Award**
8. M.A. Batista, G. Buscaglia, C. Barcelos, L. Velho, L.G. Nonato. Animating liquids in a still image. *Computer Graphics International - CGI*, 1–8 2011.
  9. D. Bonilla, L. Velho, A. Nachbin, L.G. Nonato. Fluid Warping. *IV Iberoamerican Symposium in Computer Graphics - SIACG*, 2009.
  10. M.A.S. Lizier, J.F. Shepherd, L.G. Nonato, J. Comba, C.T. Silva. Comparing Techniques for Tetrahedral Mesh Generation. *International Conference of the Engineering Mechanics Institute*, 1–6, 2008.
  11. I.L.L. Cunha, A. Lacassa, V. Polizelli-Junior, J.P. Gois, M.C.F. Oliveira, L.G. Nonato, A. Castelo. Adaptive Algebraic Mesh Generation from Implicit Functions, *XXIX Iberian Latin American Congress on Computational Methods - CILAMCE*, 2008.
  12. R. Duran, L.S. Machado, L.G. Nonato, O. Bruno. Modeling and simulation of the human eye. *SPIE - Ophthalmic Technologies XVII*, v. 6426, pp. 1-12, 2007.
  13. A.J. Cuadros-Vargas, L.G. Nonato. IMESH: Generating quality meshes from images. *European Conference on Computational Fluid Dynamics - ECCOMAS*, pp.1-13, 2006.
  14. A.J. Cuadros-Vargas, L.G. Nonato, E. Tejada-Gamero, T. Ertl. Generating Segmented Tetrahedral Meshes from Regular Volume Data for Simulation and Visualization Applications. *CompImage*, 2006.
  15. C.T. Ferraz, L.G. Nonato, J.A. Cuminato. An-Edge preserving multigrid-like technique for image denoising. *Intern. Conf. on Image Analysis and Recognition - Lecture Notes in Computer Science*, v. 4141, pp. 126-137, 2006.
  16. E. Tejada-Gamero, J.P. Gois, L.G. Nonato, A. Castelo, T. Ertl. Hardware-accelerated Extraction and Rendering of Point Set Surfaces. *Eurographics/IEEE-VGTC Symposium on Visualization - Eurovis*, pp. 21-28, 2006.
  17. F. Paulovich, L.G. Nonato, R. Minghim. Visual Mapping of Text Collections through a Fast High Precision Projection Technique. *Intern. Conf. on Information Visualization*, pp. 282-290, 2006.
  18. L.G. Nonato, A.M. Silva, J. Batista, O. Bruno. Circulation and Topological Control in Image Segmentation. *X Iberoamerican Congress on Patter Recognition - Lecture Notes in Computer Science*, v. 3773, pp. 377-391, 2005.
  19. F.O. Santos, L.G. Nonato, A. Castelo, K.C. Estacio, N. Mangiavacchi. A New Meshfree Approach for Fluid Flow Simulation with Free Surface. *Congreso Argentino de Mecanica Computacional*, 2005.
  20. R. Minghim, H. Levkowitz, L.G. Nonato, L. Watanabe, V.C.L. Salvador, H. Lopes, S. Pesco, G. Tavares. Spider Cursor: A simple versatile exploration tool for data visualization. *ACM Graphite*, pp. 307-313, 2005.
  21. L.G. Nonato, A. Castelo, M.A.S. Lizier, M.C.F. Oliveira. Topological Approach for Detecting Objects from Images. *Vision Geometry XII - Proceedings Electronic Imaging*, v. 5300, pp. 62-73, 2004.
  22. H.H. Biscaro, A. Castelo, L.G. Nonato. Reconstrução a partir de Pontos não Organizados Utilizando Funções de Morse Discretas. *Iberian Latin American Congress on Computational Methods - CILAMCE*, pp. 1–8, 2004.
  23. J.P. Gois, A. Castelo, L.G. Nonato, H.H. Biscaro. Surface Reconstruction: Classification, Comparisons and Applications. *XXV Iberian Latin American Congress on Computational Methods - CILAMCE*, pp. 1–8, 2004.
  24. A.J. Cuadros-Vargas, L.G. Nonato. Geração de Malhas Delaunay Bidimensionais a partir de Imagens. *XXV Iberian Latin American Congress on Computational Methods - CILAMCE*, pp. 1–8, 2004.

25. L.G. Nonato, N. Mangiavacchi, F.S. de Sousa, A. Castelo, J.A. Cuminato. A Mass Conserving Smoothing Method. *XIV Congresso sobre metodos numericos y sus aplicaciones - ENIEF*, pp. 1–6, 2004.
26. R. Minghim, L.G. Nonato, J.E.S. Batista, C.I. Biscegli, R.W.A. Franco, L.A.C. Jorge. Three-dimensional Reconstruction of Magnetic Resonance Images of Mango and Papaya. *World Congress of Computers in Agriculture and Natural Resources - American Society of Agricultural Engineers*, pp. 86–92, 2002.
27. F.S. de Sousa, N. Mangiavacchi, A. Castelo, L.G. Nonato, M.F. Tome, J.A. Cuminato. Numerical Simulation of 3D Free-surface Flows with Surface Tension. *Intern. Meeting on High Performance Computing for Computational Sciences - VECPAR'2002*, pp. 225–238, 2002.
28. N. Mangiavacchi, L.G. Nonato, D.R. Izquierdo, A. Castelo. A least-square meshless finite-difference method for the Navier-Stokes equations. *ACOMEN'2002*, 2002.
29. R. Minghim, V.C.L. Salvador, B.S. Freitas, L.G. Nonato, M.C.F. Oliveira. Distributed Sound for Volumes - Data Analysis Using Distributed Visualization and Sonification. *Visualization and Data Analysis - Proceedings of SPIE*, v. 4665, pp. 379–390, 2002.
30. N. Mangiavacchi, F.S. de Sousa, A. Castelo, L.G. Nonato, M.F. Tome, J.A. Cuminato. Simulation of 3-D free-surface flows with surface tension. *Congresso Brasileiro de Engenharia Mecanica - COBEM'01*, pp. 1–6, 2001.
31. P.R. Oliveira, R.F. Romero, L.G. Nonato, J. Mazucheli. Techniques for Image Compression: a comparative analysis. *SBRN'00*, Rio de Janeiro, pp. 249–254, 2000.
32. V.G. Ferreira, J.A. Cuminato, M.F. Tome, N. Mangiavacchi, A.O. Fortuna, A. Castelo, L.G. Nonato. Simulação de escoamentos incompressíveis com superfícies livres e rígidas utilizando modelos de turbulência K-E. *II Escola Brasileira de Primavera - Transição e Turbulência*, pp. 412–421, 2000.
33. N. Mangiavacchi, A. Castelo, J.A. Cuminato, M.F. Tome, V.G. Ferreira, L.G. Nonato, S. McKee. Numerical simulation of surface tension dominated axisymmetric free surface flows. *Encontro Nacional de Ciencias Termicas*, pp. 1–6, 2000.
34. M.F. Tome, N. Mangiavacchi, A. Castelo, J.A. Cuminato, A.O. Fortuna, L.G. Nonato, L. Grossi, V.G. Ferreira. A finite difference technique for simulating three-dimensional non-newtonian free surface flows. *Encontro Nacional de Ciencias Termicas*, pp. 1–6, 2000.
35. J.A. Cuminato, L.G. Nonato, N.N.B. Franco. WEB Tool for Teaching Numerical Methods to Engineering and Science Students. *International Conference on Engineering and Computer Education*, 1–7, 2000.

*Conference on Graphics, Patterns and Images - SIBGRAPI*<sup>2</sup>

1. A.Z. Peixinho, B.C. Benato, L.G. Nonato, A.X. Falcao. Delaunay Triangulation Data Augmentation Guided by Visual Analytics for Deep Learning, *IEEE Proceedings of SIBGRAPI*, pp. 384–391, 2018.
2. M.D. Dias, F. Petronetto, P. Valdivia, L.G. Nonato. Graph Spectral Filtering for Network Simplification, *IEEE Proceedings of SIBGRAPI*, pp. 345–352, 2018.
3. M.D. Dias, M.R. Mansour, F. Dias, F. Petronetto, C.T. Silva, L.G. Nonato. A Hierarchical Network Simplification Via Non-Negative Matrix Factorization, *IEEE Proceedings of SIBGRAPI*, pp. 119–126, 2017.

**Honorable Mention Award**

4. R.U. Nakanishi, J.P. Ono, P. Pagliosa, L.G. Nonato, A. Paiva. Partial Similarity of 3D Shapes Using Cross Recurrence Plot, *IEEE Proceedings of SIBGRAPI*, pp. 448–454, 2016.
5. L. Pagliosa, P. Pagliosa, L.G. Nonato. Understanding Attribute Variability in Multidimensional Projections, *IEEE Proceedings of SIBGRAPI*, pp. 297–304, 2016.

**Honorable Mention Award**

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<sup>2</sup>SIBGRAPI is the major Latin American conference on, Graphics, Visualization, Computer Vision and Imaging, with an acceptance rate ranging from 19% – 33%. Since 2015, SIBGRAPI Proceedings are being published as a special issue of Computers & Graphics journal.

6. D. Motta, M. Oliveira, P. Pagliosa, L.G. Nonato, A. Paiva. Exploratory segmentation of vector fields using multidimensional projection, *IEEE Proceedings of SIBGRAPI*, pp. 250–256, 2015.
7. T. Etienne, P. Pagliosa, L.G. Nonato. Linea: Building Timelines from Unstructured Text *IEEE Proceedings of SIBGRAPI*, pp. 234–241, 2015.
8. J.H.P. Ono, F. Sikansi, D.C. Correa, F.V. Paulovich, A. Paiva, L.G. Nonato Concentric RadViz: visual exploration of multi-task classification *IEEE Proceedings of SIBGRAPI*, pp. 165–172, 2015.  
**Honorable Mention Award**
9. E. Gomez-Nieto, D. Motta, L.G. Nonato. Semantically aware dynamic layouts, *IEEE Proceedings of SIBGRAPI*, pp. 220–226, 2014.
10. A. Soriano, F. Paulovich, L.G. Nonato, M.C.F. Oliveira. Visualization of music collections based on structural content similarity, *IEEE Proceedings of SIBGRAPI*, pp. 25–32, 2014.
11. D.C. Escalante, G. Taubin, L.G. Nonato, S. Goldenstein. Using Unsupervised Learning for Graph Construction in Semi-Supervised Learning with Graphs, *IEEE Proceedings of SIBGRAPI*, pp. 24–30, 2013.
12. P. Pagliosa, R. Martins, D. Cedrim, A. Paiva, R. Minghim, L.G. Nonato. MIST: Multiscale Information and Summaries of Texts, *IEEE Proceedings of SIBGRAPI*, pp. 91–98, 2013.
13. E. Gomez-Nieto, W. Casaca, L.G. Nonato, G. Taubin. Mixed Integer Optimization for Layout Arrangement, *IEEE Proceedings of SIBGRAPI*, pp. 115–122, 2013.  
**Best Paper Award**
14. P. Valdivia, D. Cedrim, F. Petronetto, A. Paiva, L.G. Nonato. Normal Correction Towards Smoothing Point-based Surfaces, *IEEE Proceedings of SIBGRAPI*, pp. 1–8, 2013.
15. W. Casaca, E. Gomez-Nieto, C. Ferreira, G. Tavares, P. Pagliosa, F. Paulovich, L.G. Nonato, A. Paiva. Colorization by multidimensional projection, *IEEE Proceedings of SIBGRAPI*, pp. 32–38, 2012.
16. L.F. Silva, L.F. Scheidegger, T. Etienne, J. COMBA, L.G. Nonato, C.T. Silva. Connectivity Oblivious Merging of Triangulations, *IEEE Proceedings of SIBGRAPI*, pp. 118–125, 2012.  
**Best Paper Award**
17. W. Casaca, A. Paiva, L.G. Nonato. Spectral Segmentation using Cartoon-Texture Decomposition and Inner Product-based Metric, *IEEE Proceedings of SIBGRAPI*, pp. 266–273, 2011.
18. P. Joia, E. Gomez, G. Botelho, J. Batista, A. Paiva, L.G. Nonato. Projection-based Image Retrieval using Class-Specific Metrics, *IEEE Proceedings of SIBGRAPI*, pp. 125–132, 2011.
19. A. Cuadros-Vargas, L.G. Nonato, V. Pascucci. Combinatorial Laplacian Image Cloning. *IEEE Proceedings of SIBGRAPI*, pp. 236–241, 2011.  
**Best Paper Award**
20. M.A.S. Lizier, M. Siqueira, J. Daniels, C.T. Silva, L.G. Nonato. Template-based Remeshing for Image Decomposition, *IEEE Proceedings of SIBGRAPI*, pp. 95–102, 2010.
21. F. Bissi, C. Dietrich, J. Comba, L.G. Nonato. Mesh Processing using On-the-Fly Connectivity Reconstruction given by Regular Triangulations. *IEEE Proceedings of SIBGRAPI*, pp. 1–8, 2010.
22. J.P. Gois, V. Polizelli-Junior, T. Etienne, E. Tejada-Gamero, A. Castelo, T. Ertl, L.G. Nonato. Robust and Adaptive Surface Reconstruction using Partition of Unity Implicits. *IEEE Proceedings of SIBGRAPI*, pp. 95–102, 2007.
23. A.J. Cuadros-Vargas, L.C. Gerhardinger, M. Castro, J. Batista, L.G. Nonato. Improving 2D mesh image segmentation with Markovian Random Fields. *IEEE Proceedings of SIBGRAPI*, pp. 61–68, 2006.
24. J.P. Gois, T. Etienne, E. Tejada-Gamero, L.G. Nonato, A. Castelo, T. Ertl. Curvature-driven Modeling and Rendering of Point-Based Surfaces. *IEEE Proceedings of SIBGRAPI*, pp. 27–34, 2006.
25. A.J. Cuadros-Vargas, T. Etienne, R. Minghim, L.G. Nonato. Imesh: An Image Based Quality Mesh Generation Technique. *IEEE Proceedings SIBGRAPI*, pp. 345–348, 2005.
26. A.J. Cuadros-Vargas, L.G. Nonato, M.C.F. Oliveira, R. Minghim. Beta-connection: An Approach to Generate Families of Models from Planar Sections. *IEEE Proceedings SIBGRAPI*, pp. 187–194, 2002.



27. A.D. Alves, M.C.F. Oliveira, R. Minghim, L.G. Nonato. Interactive Visualization over the WWW. *IEEE Proceedings SIBGRAPI*, pp. 259–266, 2000.

#### Book Chapters

1. A. Dal Col, P. Valdivia, F. Petronetto, F. Dias, C.T. Silva, L.G. Nonato. Wavelet-Based Visual Data Exploration. L. Stankovic and E. Sejdic (Org.). *Vertex-Frequency Analysis of Graph Signals*, 1ed., Springer, pp. 459-478, 2019.
2. R. Duran, F. Margarido, L.G. Nonato, L.A. Carvalho, O. Bruno. Modelagem e Simulação do Sistema Óptico. O.M. Bruno and L.A. Carvalho. (Org.). *Óptica e Fisiologia da Visão: uma abordagem multidisciplinar*, 1ed.: Rocca, pp. 202-213, 2008.
3. H. Lopes, L.G. Nonato, S. Pesco, G. Tavares. Dealing with Topological Singularities in Volumetric Reconstruction. P.-J. Laurent, P. Sablonniere, and L. Schumaker (Org.). *Curve and Surface Desing*, Vanderbilt University Press, pp. 229-238, 1999.

#### RESEARCH GRANTS (PI only)

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- **CeMEAI: Center for Mathematical Sciences Applied to Industry**  
*Sponsor:* São Paulo State Funding Agency - Fapesp Cepid #2013/07375-0  
*Period:* 07/2013 to 06/2018  
*Investigators:* J. Cuminato (PI), L.G. Nonato (PI), F. Louzada (PI), J. Stern (PI), A.P.L. Carvalho (PI), J.M.M. Perez (PI), L. Santos (PI)  
*Amount (estimate):* R\$ 15,000,000.00 ~ U\$ 4,500,000.00
- **Challenges in Exploratory Visualization of Multidimensional Data: Paradigms, Scalability and Applications**  
*Sponsor:* São Paulo State Funding Agency - Fapesp Thematic Project #2011/22749-8  
*Period:* 09/2012 to 11/2016  
*Investigators:* L.G. Nonato (PI), M.C.F. Oliveira (PI), Rosane Minghim (PI), Helio Pedrini (PI)  
*Amount:* R\$ 1,560,000.00 ~ U\$ 480,000.00
- **Discrete Differential Forms on Surfaces: Paradigms, Foundations, and Applications**  
*Sponsor:* CNPq - Special Visiting Research (PVE) #400749/2014-9  
*Period:* 10/2014 a 09/2017  
*Investigators:* L.G. Nonato (PI), G. Taubin (PI)  
*Amount:* R\$ 157,200.00 ~ U\$ 49,000.00
- **Exploratory Visualization of Large Data Sets**  
*Sponsor:* CNPq - Productivity in Research (level 1C) #302643/2013-3.  
*Period:* 03/2014 a 02/2018  
*Investigator:* L.G. Nonato (PI)  
*Amount:* R\$ 115,200.00 ~ U\$ 36,000.00
- **Projeto Universal: Spectral and Topological Methods for Modeling, Processing and Visualizing Massive Data**  
*Sponsor:* CNPq - Projeto Universal #560030/2010-0  
*Period:* 10/2010 - 09/2012  
*Investigator:* L.G. Nonato (PI)  
*Amount:* R\$ 32,000.00 ~ U\$ 10,000.00
- **Geometric Modeling, Deformation, and Visualization of Massive Data**  
*Sponsor:* CAPES/DAAD - Probal#262/07  
*Period:* 2006-2008  
*Investigators:* L.G. Nonato (PI), J. Comba (PI), R. Minghim (PI), T. Ertl (PI)  
*Amount (estimate):* R\$ 50,000.00 ~ U\$ 15,000.00

#### TEACHING (last 5 years)

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- University of São Paulo

SME5941 Matrix Spectral Theory 2019 (Fall)  
 SME5941 Topics in Data Analysis 2014 (Fall), 2015 (Fall)  
 SME0320 Statistics I 2016 (Spring)  
 SME5783 Numerical Analysis 2015 (Spring)  
 SME0306 Numerical Calculus 2012 (Fall), 2013 (Spring), 2014 (Spring),  
 2015 (Spring), 2016 (Spring)

- New York University

DS-GA 3001 Topological Data Analysis and Graph Signal Processing 2017 (Spring)  
 CUSP-GX 5006 Machine Learning for Cities 2017 (Spring)  
 DS-GA-3001 Advanced Python for Data Science 2018 (Spring)  
 DS-GA-3001 Special Topics: Scientific Visualization 2018 (Spring)  
 DS-GA-1007 Programming for Data Science 2017 (Fall), 2018 (Fall)

## SUPERVISED STUDENTS

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- *Ph.D. Concluded*

- Markus Diego, Simplification and Analysis of Complex Networks Endowed with Multiv. Data, 2018.
- Paola Valdivia, Graph Signal Processing for Visual Analysis and Data Exploration, 2018.
- Alcebiádes Dal Col Jr, Visual Analytics via Graph Signal Processing, 2018.
- Erik Gomez-Nieto, Optimal Layout Construction, 2017.
- Adriano Barbosa, Kernalized Data Visualization, (in Portuguese), 2016.
- Paulo Joia, Projection Methods for Group Identification (in Portuguese), 2015.
- Wallace Casaca, Graph Laplacian for Spectral Clustering and Seeded Image Segmentation, 2014.
- Marcos Aurelio Batista, Animating Fluids in Still Images (in Portuguese), 2011
- Mario A. S. Lizier, Mesh Generation and Refinement from Textured Images (in Portuguese), 2009
- Kemelli C. Estacio - Fluid Flow Simulation on Point Set Surfaces (in Portuguese), 2008
- Alex J. Cuadros-Vargas, Generating Segmented Tetrahedral Meshes from Images (in Portuguese), 2006
- Helton Biscaro - Reconstruction from Scattered Points: A Topological Approach (in Portuguese), 2005

- *Master Concluded*

- Evandro Ortigossa - Multivariate Time Series Visualization (in Portuguese), 2018.
- Jorge Henrique Piazzentin Ono. Music Data Set Visualization (in Portuguese), 2015.
- Lucas de Carvalho Pagliosa - Web-based Multidimensional Data Visualization (in Portuguese), 2015.
- Martha Dias Ferreira - Cover Song Identification in Large Data Sets (in Portuguese), 2014.
- Paola Llerena Valdivia - Norma Correction for Point Cloud Surfaces Smoothing (in Portuguese), 2013.
- Erick Gomez Nieto - Multidimensional Projection of Web Search (in Portuguese), 2012.
- Fernando Bissi Pires - Regular Triangulations and Applications (in Portuguese), 2008.
- Alex Gimenes - Navier Stokes Simulation on Digital Images (in Portuguese), 2008.
- Luis Gustavo Pinheiro Machado - Quality mesh generation for terrain modeling (in Portuguese), 2007.
- Rodrigo Duran - Human Viewing Simulation (in Portuguese), Universidade de São Paulo, 2005.
- Ana Paula Resende Malheiro - Modeling and Visualizing 2D Meshes (in Portuguese), 2005.
- Daniel R. Izquierdo Peña - Moving Least Square for Finite Differences Method (in Portuguese), 2002.
- Patricia S.H. Cateriano - Visualiz. and Navigating on Unstruct. Volumes (in Portuguese), 2002.
- Alex J.C. Vargas - Beta-Connection: A Family of Models from Planar Sections (in Portuguese), 2001.
- Rogerio E. da Silva - A Simulator for Human Viewing using Ray Tracing (in Portuguese), 2001.

- *On going Ph.D.*

- Thales Gonçalves, subject: Crime Analytics and Forecast.
- Rodrigo Contreras, subject: Symmetries for High-dimensional Data Visualization.
- Germain Garcia, subject: Crime Data Analysis via Graph Signal Processing.

- *Post-doctorate supervisions*
  - Fabiano Petronetto. Multidimensional Data Visualization.
  - Fabio Dias. Graph Signal Processing for Visualization.
  - Dimaz Mat3n3z Morera. Point-set Surface Geometry Processing.
  - Paulo Pagliosa. Multidimensional Data Visualization.
  - Wallace Casaca. Visualization and Pattern Recognition.
  - Dalia B. Correa. Discrete Differential Forms on Triangle Surfaces.

## PROFESSIONAL SERVICE

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### *Editorial Boards*

*Editor in Chief:* SBMAC/SpringerBriefs in Appl.Math.Comp.Sci. (10/2017 - 09/2019)

*Associate Editor:* IEEE Trans. Vis. Comp. Graph. (12/2017 - 11/2019)

*Associate Editor:* Computer Graphics Forum (04/2011 - 03/2014)

*Invited Editor:* The Visual Computer Journal (2009)

*Invited Editor:* Computer Graphics Forum (2010)

### *Conference Committees*

- IEEE InfoVis – 2009, 2010
- IEEE SciVis – 2016, 2017, 2018, 2019
- EuroVis – 2013-2015, 2018
- IVAPP – 2009-2010, 2013, 2015-2017
- Sibgrapi – 2006-2008, 2010-2017

### *Organizing Committees*

- Program Co-Chair: IEEE Vis Short Paper, 2019
- Program Co-Chair: IEEE SciVis Short Paper, 2018
- Program Co-Chair: Conference on Graphics, Patterns and Images - Sibgrapi, 2009
- Program Co-Chair: Sibgrapi Workshop of Thesis and Dissertation, 2006
- Program Co-Chair: Simposio Latinoamericano de Computacion Gr3fica, Realidad Virtual y Procesamiento de Imagenes, 2015
- Program Co-Chair: Workshop on Visual Analytics, Information Visualization and Scientific Visualization: 2007,2010,2012,2013,2015,2017

### *Invited Speaker*

- *Spatio-Temporal Data Analytics via Graph Signal Processing*, Workshop on Data Science, FGV - Rio de Janeiro, 2019
- *Spatio-Temporal Data Analytics via Graph Signal Processing*, Joint Meeting Brazil-Spain in Mathematics, C3diz-Spain, 2018
- *Graph Signal Processing and Visualization: a worthwhile partnership*, Mathematics and Its Applications, Foz do Iguaçu - Brazil, 2018
- *Multidimensional Projection: Past, Present and Future*, EuroRV<sup>3</sup> Workshop - EuroVis, Cagliari - Italy, 2015
- *Multidimensional Projection and its Application in Visual Analytics* Workshop on Interactive Data Visualization - Fund. Getulio Vargas, Rio de Janeiro - Brazil, 2013
- *Multidimensional Projection for Visualizing High-Dimensional Data*, National Conference on Computational and Applied Mathematics - CNMAC, 2012

### *Journal Reviewing*

- Proceedings of the IEEE, 2017
- Computer Graphics Forum: 2007,2010
- Computerized Medical Imaging and Graphics: 2008
- Computers & Graphics: 2009,2016,2017
- Mathematics and Computers in Simulation: 2009
- Data Mining and Knowledge Discovery: 2010
- IEEE Computer Graphics and Applications 2011
- IEEE Trans. Visual. Comp. Graph.: 2011-2016
- Mathematical Methods in Applied Sciences: 2013
- IEEE Transactions on Multimedia: 2013-2014
- Multimedia Tools and Applications: 2014-2015

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