

RODRIGO ANDRADE DE BEM

CURRICULUM VITAE

WORK ADDRESS

Center of Computational Sciences – C3
Federal University of Rio Grande - FURG
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CURRENT POSITION

09/2009 – present **Center of Computational Sciences, Federal University of Rio Grande, Rio Grande, Brazil.**
Position: Assistant Professor.
Institute Director: Dr. Nelson Lopes Duarte Filho.

Main researches subjects: 3D human motion tracking, multiple cameras environments, markerless augmented reality, local features extractors and related subjects in Computer Vision, Artificial Intelligence and Information Technology.

Undergraduate teaching (Computer Engineering and Information Systems Majors): Introduction to Algorithms, Computer Vision, Introduction to IS Projects Development.

Administrative positions: Computer Engineering Major vice-coordinator.

PROFESSIONAL EXPERIENCE

03/2008 – 08/2009 **Safeweb Company, Porto Alegre, Brazil.**
Position: Systems Development Manager.
Overview: I was the IT development leader of this start-up company launching an innovative software suite solution for the new Brazilian electronic invoice system.
Supervisor: Dr. Luiz Carlos Zancanella.

04/2007 - 09/2007 **Perception Group, INRIA Rhône-Alpes, Grenoble, France.**
Position: Master Intern.
Overview: during this internship we were considering the problem of tracking moving people in multiple camera environments. The goal was to develop a 3D tracking method based on 3D probabilistic occupancy grids. A C++ software package and a technical report were produce at the end of the internship.
Supervisor: Dr. Elise Arnaud, Co-Supervisor: Dr. Edmond Boyer.

- 06/2004 - 10/2004 **Computer and Automation Laboratory, Physics Department, Federal University of Rio Grande**, Rio Grande, Brazil.
Position: Undergraduate Intern.
Overview: TCP/IP network administration and installation/management of FreeBSD servers.
Supervisor: Dr. Silvia Silva da Costa Botelho.
- 03/1999 - 10/2000 **VetorialNet ISP**, Rio Grande, Brazil.
Position: Software Developer and Network Administrator.
Overview: the main activities were the design and the development of C-CGI/PostgreSQL Web applications, management of TCP/IP networks, administration of Linux servers, Cisco routers configuration and technical support.
Supervisor: Dr. Marcelo Pias.
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EDUCATION

- 02/2005 – 03/2007 **Polytechnic School, University of São Paulo – USP**, São Paulo, Brazil.
MSc. degree in Electrical Engineering - Digital Systems.
Thesis title: A Model-Free Approach for Object Tracking in Sequences of Images.
Keywords: visual tracking; computer vision; artificial intelligence.
Advisor: Dr. Anna Helena Reali Costa.
- 03/2000 – 01/2005 **Federal University of Rio Grande**, Rio Grande, Brazil.
BEng. degree in Computer Engineering.
Monograph title: CNLPCAMove - Extraction of Movement Principal Components using the C-NLPCA Method.
Keywords: neural networks, PCA, computer vision, artificial intelligence.
Advisor: Dr. Silvia Silva da Costa Botelho.
- 03/1996 – 01/1999 **Technical High-School, Federal University of Rio Grande**, Rio Grande, Brazil.
Technician in Data Processing.
Monograph title: Manipulation of a Database Management System from Internet.
Keywords: database, PostgreSQL, C-CGI, e-commerce, Internet.
Advisor: Dr. Marcelo Pias.
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SKILLS

Research experience with 3D human motion tracking in multiple cameras environments, 2D visual tracking, artificial neural networks, dimensionality reduction with Nonlinear Principal Component Analysis (NLPCA), markerless augmented reality, local features extractors and related subjects in Computer Vision, Artificial Intelligence and Information Technology.

Proficiency in C, C++, C#, Matlab, .Net framework, web services, Linux, Windows, Internet, and a number of office applications.

LANGUAGE KNOWLEDGE

Portuguese	native
English	advanced
French	basic
Spanish	entry level

SELECTED PUBLICATIONS

Papers in Journals

BOTELHO, Silvia Silva da Costa; MATA, Maurício Magalhães; **DE BEM, Rodrigo Andrade**; ALMEIDA, Ígor Lorenzato. Applying Neural Networks to study the mesoscale variability of oceanic boundary currents. Foundations of Intelligent Systems, Lecture Notes in Computer Science/Lectures Notes in Artificial Intelligence, v. 2871, n. 15, p. 684-688, ISSN 0302-9743. Springer, 2003.

Papers in Proceedings

SIMAS, Gisele ; **DE BEM, Rodrigo** ; BOTELHO, Silvia Silva da Costa . A 3D Motion Tracking Method Based on Nonparametric Belief Propagation. **2013 IEEE ICRA**, Karlsruhe, Germany.

GULARTE, A. ; THOMASI, C. ; **DE BEM, Rodrigo** ; ADAMATTI, D. F. . Performance Evaluation of BRISK Algorithm on Mobile Devices. **VISAPP, 2013**, Barcelona.

SIMAS, Gisele ; **DE BEM, Rodrigo** ; BOTELHO, Silvia Silva da Costa . 3D Representation Models Construction through a Volume Geometric Decomposition Method. **VISAPP, 2013**, Barcelona.

SIMAS, GISELE M. ; **DE BEM, R. A.** ; BOTELHO, SILVIA S. C. . Applying Nonparametric Belief Propagation to Motion Tracking Using Few a Priori Knowledge. Workshop of Theses and Dissertations (WTD) in SIBGRAPI 2012, Ouro Preto, Brazil. (in Portuguese)

DREWS JR, P. L. J. ; **DE BEM, Rodrigo Andrade** ; MELO, A. S. . Analyzing and exploring feature detectors in images. **IEEE 9th INDIN**, 2011, Lisboa.

Simas, Gisele; **DE BEM, Rodrigo**; Novelo, Lucas; Fickel, Guilherme and Botelho, Silvia. Visual Tracking Based on 3D Probabilistic Reconstruction. **ECBS-LARC: 1st IEEE Latin American Regional Conference on the Engineering of Computer Based Systems**, Rio de Janeiro, Brazil, 2009.

SIMAS, G M ; FICKEL, G P ; NOVELO, L ; **DE BEM, R A** ; BOTELHO, S S C . 3D Motion Tracking Based on Probabilistic Volumetric Reconstruction and Optical Flow. 23rd SIBGRAPI 2010, Gramado, Brazil.

SIMAS, Gisele ; FICKEL, G. ; NOVELO, Lucas ; **DE BEM, Rodrigo Andrade** ; BOTELHO, Silvia Silva da Costa . 3D Probabilistic Reconstruction Applied to Movement Analysis: a Tele-Operation Emphasis. XVIII CBA 2010, Bonito, Brazil. (in Portuguese)

SIMAS, GISELE M. ; FICKEL, GUILHERME P. ; NOVELO, Lucas ; BOTELHO, SILVIA S. C. ; **BEM, RODRIGO A. DE** . Using Computer Vision for 3D Probabilistic Reconstruction and Motion Tracking. Third Southern Conference on Computational Modeling (MCSUL 2009), Rio Grande, Brazil.

DE BEM, Rodrigo Andrade; COSTA, Anna Helena Reali. Visual tracking of multiple objects using a model-free approach. In Proc. of XVI Brazilian Automation Conference - CBA 2006, v. 1. p. 2760-2765, Salvador, Brazil, 2006 (in Portuguese).

DE BEM, Rodrigo Andrade; COSTA, Anna Helena Reali. Contours based visual tracking of multiple objects applied to robot soccer. III Meeting of Intelligent Robotics. In Proc. of XXVI Brazilian Computing Society Congress - CSBC 2006, v. 1. p. 163-172, Campo Grande, Brazil, 2006 (in portuguese).

BOTELHO, S.C.; **DE BEM, Rodrigo Andrade;** FIGUEIREDO, M.; LAUTENSCHLAGER, W.; CENTENO, T.; MATA, M. A method to extract non-linear principal components of large datasets - an application in skill transfer. **2005 IEEE International Joint Conference on Neural Networks, IJCNN '05**, Montreal, Canada.

FIGUEIREDO, M.; BOTELHO, S. S. da C.; **DE BEM, Rodrigo Andrade;** CENTENO, T. M.; LAUTENSCHLAGER, W.. Cascaded Nonlinear Principal Components Analysis: an Application in Extraction of Human Movements from Video Sequences. In Proc. of VII Brazilian Symposium on Intelligent Automation - SBAI / II IEEE Latin-American Robotics Symposium - IEEE-LARS, São Luís, Brazil, 2005.

BOTELHO, Silvia Silva da Costa; **DE BEM, Rodrigo Andrade;** ALMEIDA, Ígor Lorenzato; MATA, Maurício Magalhães. C-NLPCA: Extracting Non-Linear Principal Components of Image Datasets. In Proc. of XII Brazilian Remote Sensing Symposium - SBSR, p. 3495-3502, Goiânia, Brazil, 2005. INPE press.

BOTELHO, SILVIA S. C. ; **DE BEM, R. A. ;** FIGUEIREDO, M. ; LAUTENSCHLAGER, W. ; CENTENO, T. M. . Using C-NLPCA to extracting movements from video sequences. V Brazilian Meeting on Artificial Intelligence (V ENIA), 2005, São Leopoldo, Brazil.

DE BEM, Rodrigo Andrade; BOTELHO, Silvia Silva da Costa. NLPCAMove - Extraction of non-linear principal components of visual movement patterns. II Meeting on Intelligent Robotics. XXIV Brazilian Computing Society Congress - CSBC 2004, Salvador, Brazil (in portuguese).

DE BEM, Rodrigo Andrade; ALMEIDA, Ígor Lorenzato; BOTELHO, Silvia Silva da Costa; MATA, Maurício Magalhães. Applying neural networks to dimensional reduction of large data sets. XVIII Regional Congress of Scientific and Technological Initiation on Engineering (CRICTE 2003). Itajaí, Brazil, 2003 (in Portuguese).

DE BEM, Rodrigo Andrade; BOTELHO, Silvia Silva da Costa; MATA, Maurício Magalhães. Applying artificial neural networks for analysis of mesoscale patterns. In Proc. of XI Brazilian Remote Sensing Symposium - SBSR, v. Único. p. 2007-2014, Belo Horizonte, Brazil, 2003. INPE press (in Portuguese).

DE BEM, Rodrigo Andrade; ALMEIDA, Ígor Lorenzato; BOTELHO, Silvia Silva da Costa; MATA, Maurício Magalhães. Applying artificial neural networks to dimensional reduction and pattern identification in large data sets. I Scientific Initiation Workshop – WICCGPI. In Proc. of XVI Brazilian Symposium on Computer Graphics and Image Processing - SIBGRAPI, p. 99-104, São Carlos, Brazil, 2003 (in Portuguese).

DE BEM, Rodrigo Andrade; BOTELHO, Silvia Silva da Costa. Neural networks applied for oceanographic data analysis. In Proc. of I Scientific Initiation Congress e IV FURG Graduate Conference, Rio Grande, Brazil, 2002 (in Portuguese).

Dissertations

DE BEM, Rodrigo Andrade. A Model-Free Approach for Object Tracking in Sequences of Images. Master Thesis, Polytechnic School, University of São Paulo - USP, March, 2007 (in Portuguese).

DE BEM, Rodrigo Andrade. CNLPCAMove - Extraction of Movement Principal Components using the C-NLPCA Method. B.Eng. Monograph, Federal University of Rio Grande - FURG, December, 2004 (in Portuguese).

DE BEM, Rodrigo Andrade; LAURINO, Luiz S.. Manipulation of a Database Management System from Internet. Technician in Data Processing Monograph, Technical High-School, Federal University of Rio Grande - FURG, December, 1998 (in Portuguese).

Technical Reports

DE BEM, Rodrigo Andrade. 3D Tracking Using Occupancy Grids - Internship Report – Perception Group – INRIA Rhône-Alpes. Supervisor: Dr. Elise Arnaud, Co-Supervisor: Dr. Edmond Boyer. Grenoble, France, September, 2007.

AWARDS AND SCHOLARSHIPS

2013	IEEE Robotics and Automation Society Travel Award to attend the IEEE ICRA 2013, Karlsruhe, Germany.
2005 – 2007	CNPq (Brazilian Federal Government) Master of Science (M.S.) Scholarship.
2003	Champion of ACM International Programming Contest at Site URI Erechim - The 2003 ACM South America Programming Contest (12th place of 116 teams).
2002	Young Researcher Award - Second Place in the Engineering field, Federal University of Rio Grande/CNPq (Brazilian Federal Government), Rio Grande, Brazil.
2002 - 2004	CNPq (Brazilian Federal Government) Scientific Initiation Scholarship.
2001 - 2002	CNPq (Brazilian Federal Government) Scientific Initiation Scholarship.

INVITED TALKS

02/2013	<u>3D Representation Models Construction through a Volume Geometric Decomposition Method.</u> Computer Vision Laboratory Seminar, ETHZ, Zurich, Switzerland. Invited by Dr. Andrea Fossati.
02/2013	<u>3D Representation Models Construction through a Volume Geometric Decomposition Method.</u> Centre for Vision, Speech and Signal Processing (CVSSP) Seminar, University of Surrey, United Kingdom. Invited by Dr. Teo de Campos.

11/2013

Brazilian National Electronic Invoice Project (NFe), **2nd Week of Archival Science, Federal University of Rio Grande - FURG**. Invited by event organizers.

ACADEMIC ADVISING

Master

Gisele Moraes Simas. MSc. on Computational Modeling. Dissertation title: Applying Nonparametric Belief Propagation to Motion Tracking Using Few a Priori Knowledge. Federal University of Rio Grande, Rio Grande, Brazil. 2012. (in Portuguese)

Professional Education

Fabio Enrique Moreira Rodríguez. Web Applications Development. Final work title: DTec-Web – Web Learning Objects Applied to Teaching of Mechanical Technical Drawing. Federal University of Rio Grande, Rio Grande, Brazil, 2012. (in Portuguese)

Fabiano da Silveira Hood. Web Applications Development. Final work title: ITS-DELET – An Issue Tracking System to Track Consumer’s Complaints in an Electricity Distribution Company. Federal University of Rio Grande, Rio Grande, Brazil, 2012. (in Portuguese)

Lucélia Moreira Chepe. Web Applications Development. Final work title: SGC-WEB – Real State Web Management. Federal University of Rio Grande, Rio Grande, Brazil, 2012. (in Portuguese)

Undergraduate

Daniel Rodrigues Thiel. Computer Engineering, BEng. monograph title: A Software and Hardware Prototype Proposal for a Multiple Camera Acquisition Environment. Federal University of Rio Grande, Rio Grande, Brazil. December, 2012. (in Portuguese)

Alexander Rodrigues Gularte and **Camila Dasso Thomasi**, Computer Engineering, BEng. monograph title: M-BRISK: Adapting the BRISK Algorithm to Mobile Devices. Federal University of Rio Grande, Rio Grande, Brazil. December, 2011. (in Portuguese)

Guilherme Pinto Fickel, Computer Engineering, BEng. monograph title: Visual Tracking Based in 3D Probabilistic Reconstruction and Optical Flow. Federal University of Rio Grande, Rio Grande, Brazil. January, 2009.

Gisele Moraes Simas, Computer Engineering, BEng. monograph title: Using computer vision for probabilistic 3D reconstruction and motion tracking. Federal University of Rio Grande, Rio Grande, Brazil. January, 2008.

SELECTED EVENTS

1. 2013 IEEE International Conference on Robotics and Automation (ICRA), Karlsruhe, Germany.
 2. International Conference on Computer Vision Theory and Applications (VISAPP), 2013, Barcelona.
 3. The 2012 ACM Programming Contest South America/Brazil - Local First Phase, Pelotas, Brazil (TEAM COACH).
 4. The 2011 ACM Programming Contest South America/Brazil - Local First Phase, Rio Grande, Brazil (LOCAL ORGANIZER).
 5. XXIV Scientific Initiation Regional Congress on Engineering - XXIV CRICTE, Rio Grande, Brazil, 2010 (LOCAL CO-ORGANIZER).
 6. First UNU-IIST International School on Formal Engineering Methods, Rio de Janeiro, 2009.
 7. First IFAC Workshop on Multivehicle Systems. 2006.
 8. Brazilian Symposium on Computer Graphics and Image Processing - SIBGRAPI 2005. Scientific Initiation Workshop -WIC 2005 (REVIEWER).
 9. VII Brazilian Symposium on Intelligent Automation – SBAI e II IEEE Latin-America Robotics Symposium – IEEE-LARS. 2005 (REVIEWER).
 10. The 2003 ACM South America Programming Contest. 2003.
 11. 2nd Latin American Robotics Competition and IEEE Student Robotics Competition. 2003.
 12. The 2001 South American Regional of the ACM Programming Contest. 2001.
 13. The 2000 South America Regional of the ACM Programming Contest. 2000.
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MEMBERSHIPS

Institute of Electrical and Electronics Engineers (IEEE).
Brazilian Computer Society (SBC).

REFERENCES

Available on request.