

João V. B. Soares

Curriculum Vitae

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Contact information

Full Name: João Vitor Baldini Soares.
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Education

- Aug/2008 – May/2015 • Ph.D. in Computer Science
University of Maryland, College Park
- Aug/2007 – May/2008 • Ph.D. student in Computer Science
(transferred to Univ of Maryland)
Pennsylvania State University
- Feb/2004 – Nov/2006 • Master of Science in Computer Science
University of São Paulo, Brazil.
- Feb/2000 – Dec/2003 • Bachelor of Science in Computer Science
University of São Paulo, Brazil.

Experience

- Jan/2017 – to date • Research Engineer at Yahoo! (acquired by Verizon)

As a research engineer in Yahoo's video organization, I work on video analysis using computer vision, for purposes of improved content understanding, as well as broadcaster monitoring and compliance. I have also worked on different components of our video search and recommendation system.

Manager: Guy Dassa

Experience (continued)

June/2015 – Dec/2016

- Software Development Engineer at Yahoo!

I worked on content analysis and enrichment at Yahoo, contributing to systems for automatic analysis of text, images, and videos. This involved implementing NLP and computer vision techniques and scaling them up to handle large amounts of content ingested by Yahoo. I was involved in several stages of development of new product features, from prototyping to production and data analysis. During this period, I also gained practice with continuous integration and delivery frameworks, as well as data processing frameworks like Storm and Hadoop.

Managers: Ralph Rabbat and Kostas Tsioutsoulis

Summer/2009 – Spring/2015

- Research Assistant, University of Maryland, College Park

Leafsnap is an iPhone (and iPad) app for automatic identification of trees from photos of their leaves, counting with over 1.5 million downloads. I improved the accuracy and speed of the algorithms that perform leaf segmentation as part of the recognition pipeline. I have also helped to launch Leafsnap UK, which involved work from web server and database setup to iOS programming. More information on Leafsnap is available at <http://leafsnap.com>.

I also worked on developing a comprehensive set of attributes for 2D shape analysis. The attributes were designed to be intuitive and computationally efficient, so they may be applied to a range of problems where prior knowledge can be used. We experimented with the attributes on remote sensing images for discrimination of man-made objects (roads, buildings, etc.) and on photographs of leaves from Leafsnap for identification of tree species.

Supervisors: Prof. David W. Jacobs and Prof. Andrea Baraldi

Summer/2014

- Research and Development Intern, General Electric Global Research

I worked on developing new methods for live detection of missing teeth in mining excavators. This problem is highly challenging due to partial or complete occlusion of teeth by earth, as well as changes in pose and lighting, including cast shadows. The internship involved creating new approaches and coding proof-of-concept implementations in Python and Matlab, as well as versions closer to production in C++.

Supervisor: Dr. Ser-Nam Lim

Fall/2007

- Research Assistant, Pennsylvania State University
Supervisor: Prof. Yanxi Liu

Experience (continued)

Nov/2006 – Jul/2007

- Research Assistant, University of São Paulo, Brazil.
Supervisor: Prof. Roberto M. Cesar Jr.

Feb/2004 – Nov/2006

- MSc student, University of São Paulo, Brazil.

I performed original research on the automatic detection of blood vessels in retinal images. The result was a state-of-the-art segmentation method with an open-source implementation, including a GUI for end-users. The segmentation method was used as part of an experimental pipeline for the detection of diabetic retinopathy in patients. More information at <http://retinal.sourceforge.net>

My Master's thesis on this work received an Honorable Mention in the MSc Thesis Contest of XXXIII Latin American Conference on Informatics. The thesis was also selected among the top 10 submitted to the Workshop of Thesis and Dissertations of the XXVII Congress of the Brazilian Computer Society (SBC).

Supervisor: Prof. Roberto M. Cesar Jr.

Specific Skills

Research

- General background in computer vision, image processing, and machine learning.
Experience with image segmentation, 2D shape analysis, object detection, graphical models, wavelets, and mathematical morphology.
Previous work in applications such as remote sensing, automatic inspection, retinal image analysis, and face recognition.

Programming

- Extensive programming experience with Python, C, Java and Matlab.

Teaching Experience

Spring/2012

- Teaching Assistant, University of Maryland
Course: Image Segmentation (graduate-level computer vision course)
Professor: David Jacobs

Spring/2009

- Teaching Assistant, University of Maryland
Course: Introduction to Low-Level Programming Concepts
Instructor: Larry Herman

Teaching Experience (continued)

- Fall/2008
 - Teaching Assistant, University of Maryland
Course: Organization of Programming Languages
Professor: Jeff Foster
- Spring/2008
 - Teaching Assistant, Pennsylvania State University
Course: Programming for Engineers with MATLAB
Professor: Sanjukta Bhowmick

Publications

Journal Articles

- Kress, W. J., Garcia-Robledo, C., SOARES, J. V. B., Jacobs, D., Wilson, K., Lopez, I. C., and Belhumeur, P. N. Citizen Science and Climate Change: Mapping the Range Expansions of Native and Exotic Plants with the Mobile App Leafsnap. *BioScience*, 68(5): 348-358, 2018.
- SOARES, J. V. B. and Jacobs, D. W. Efficient segmentation of leaves in semi-controlled conditions. *Machine Vision and Applications*, 24(8):1623-1643, 2013.
- Jelinek, H. F., Cree, M. J., Leandro, J. J. G., SOARES, J. V. B., Cesar-Jr., R. M. and Luckie, A. Automated segmentation of retinal blood vessels and identification of proliferative diabetic retinopathy. *Journal of the Optical Society of America A*, 24(5):1448-1456, 2007.
- SOARES, J. V. B., Leandro, J. J. G., Cesar-Jr., R. M., Jelinek, H. F., and Cree, M. J. Retinal vessel segmentation using the 2-D Gabor wavelet and supervised classification. *IEEE Transactions on Medical Imaging*, 25:1214-1222, 2006.
- Cornforth, D. J., Jelinek, H. F., Leandro, J. J. G., SOARES, J. V. B., Cesar-Jr., R. M., Cree, M. J., Mitchell, P., and Bossomaier, T. R. J. Development of retinal blood vessel segmentation methodology using wavelet transforms for assessment of diabetic retinopathy. *Complexity International*, 11, 2005. Available at: <http://www.complexity.org.au/ci/vol11/>.

Conference Papers

- Lim, S. N. SOARES, J. V. B., and Zhou, N. Tooth Guard: A Vision System for Detecting Missing Tooth in Rope Mine Shovel. In *Winter Conference on Applications of Computer Vision (WACV)*, 2016.
- Kumar, N., Belhumeur, P. N., Biswas, A., Jacobs, D. W., Kress, W. J., Lopez, I. C. and SOARES, J. V. B. Leafsnap: A computer vision system for automatic plant species identification. In *European Conference on Computer Vision (ECCV)*, pp. 502-516, 2012.

Publications (continued)

- SOARES, J. V. B., Leandro, J. J. G., Cesar-Jr., R. M., Jelinek, H. F., and Cree, M. J. Using the 2-D Morlet wavelet with supervised classification for retinal vessel segmentation. In *IV Workshop of Thesis and Dissertations - CD-ROM, 18th Brazilian Symposium on Computer Graphics and Image Processing (SIBGRAPI)*, Natal, Brazil, 2005.
- Cree, M. J., Leandro, J. J. G., SOARES, J. V. B., Cesar-Jr., R. M., Tang, G., Jelinek, H. F., and Cornforth, D. J. Comparison of various methods to delineate blood vessels in retinal images. In *Proc. of the 16th National Congress of the Australian Institute of Physics*, Canberra, Australia, 2005. Available at: <http://aipcongress2005.anu.edu.au/index.php?req=CongressProceedings>.
- Cornforth, D. J., Jelinek, H. F., Leandro, J. J. G., SOARES, J. V. B., Cesar-Jr., R. M., Cree, M. J., Mitchell, P., and Bossomaier, T. R. J. Development of retinal blood vessel segmentation methodology using wavelet transforms for assessment of diabetic retinopathy. In *Proc. of the Eighth Asia Pacific Symposium on Intelligent and Evolutionary Systems*, Cairns, Australia, pages 50–60, 2004.
- Leandro, J. J. G., SOARES, J. V. B., Cesar-Jr., R. M., and Jelinek, H. F. Blood vessels segmentation in non-mydratric images using wavelets and statistical classifiers. In *Proc. of the 16th Brazilian Symposium on Computer Graphics and Image Processing - SIBGRAPI*, pages 262–269. IEEE Computer Society Press, 2003.

Book Chapter

- SOARES, J. V. B. and Cesar-Jr., R. M. Segmentation of Retinal Vasculature Using Wavelets and Supervised Classification: Theory and Implementation, in *Automated Image Detection of Retinal Pathology*, H. F. Jelinek and M. J. Cree, Editors. CRC Press, 2009.

MSc Thesis

- SOARES, J. V. B. Segmentação de vasos sanguíneos em imagens de retina usando wavelets e classificadores estatísticos. *Master's thesis, Institute of Mathematics and Statistics - University of São Paulo*, November, 2006.

Technical Report

- SOARES, J. V. B., Baraldi, A. and Jacobs, D. W. Segment-based simple-connectivity measure design and implementation. *University of Maryland, College Park, Technical Report*, 2014. Available: <http://hdl.handle.net/1903/15430>

Publications (continued)

Conference Abstracts

- SOARES, J. V. B. and Cesar-Jr., R. M. Retinal Vasculature Segmentation Using Wavelets and Supervised Classification, in *Proc. of the XXVII Congress of the Brazilian Computer Society (SBC), Workshop of Thesis and Dissertations Selected among top 10 MSc dissertations submitted to workshop*, Rio de Janeiro, Brazil, 2007.
- Cree, M. J., Tang, G., Leandro, J. J. G., Cesar-Jr., R. M., SOARES, J. V. B., Wong, T., Cornforth, D. J., Jideh, B., and Jelinek, H. F. Automated detection of retinal blood vessels in diabetes. In *ADS & ADEA Annual Scientific Meeting*, Sydney, Australia, page 154, 2004.
- SOARES, J. V. B., Leandro, J. J. G., Cesar-Jr., R. M., and Jelinek, H. F. Blood vessel segmentation in optic fundus images using wavelets and statistical classifiers. In *11th Scientific Initiation International Symposium of the University of São Paulo (SIICUSP)*, 2003.
- Jelinek, H. F., Cornforth, D. J., Cree, M. J., Cesar-Jr., R. M., Leandro, J. J. G., SOARES, J. V. B., and Mitchell, P. Automated characterisation of diabetic retinopathy using mathematical morphology: a pilot study for community health. In *2nd Annual NSW Primary Health Care Research and Evaluation Conference*, Sydney, Australia, page 48, 2003.

Patents

- Lim, S. N., Zhou, N. and SOARES, J. V. B. (2017). System and method for detecting missing tooth in mining shovel. U.S. Patent Application 15/090,646, filed October 2017.

Scholarships and Awards

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| Quarter 1/2018 | <ul style="list-style-type: none">• Verizon Digital Media Services MVP Award. Our five-person team received a 2017 “Most Valuable Player” award for our work on live athlete identification using computer vision as well as our platform for human-in-the-loop model training. |
| Quarter 4/2015 | <ul style="list-style-type: none">• Yahoo Hack Day Awards. I participated in two hack day teams. One team won best overall hack (out of 200+ submitted hacks) with a Flickr-related hack, while the other won a best creative hack award, with a Search-related hack. |
| Fall/2008 – Spring/2010 | <ul style="list-style-type: none">• Fellowship from the Computer Science Department, University of Maryland |
| Fall/2007 – Spring/2008 | <ul style="list-style-type: none">• College of Engineering Graduate Fellowship (Harry G. Miller and Glenn E. Singley Memorial), Pennsylvania State University |

Scholarships and Awards (continued)

- October/2007
 - Honorable Mention in Master's Thesis Contest of XXXIII CLEI - Latin American Conference on Informatics.
- Jul/2007
 - Master's Thesis selected among top 10 submitted to the nationwide Workshop of Thesis and Dissertations of the XXVII Congress of the Brazilian Computer Society (SBC), Rio de Janeiro, Brazil, 2007.
- Mar/2004 – Feb/2006
 - CNPq (Conselho Nacional de Desenvolvimento Científico e Tecnológico) MSc. Scholarship from a Brazilian federal agency
Project's theme: Machine learning methods for the segmentation of blood vessels in retinal images
Advisor: Prof. Roberto M. Cesar Jr.
This scholarship supported my M.Sc., allowing me to do original research in image processing and machine learning applied to the segmentation of the blood vessels in retinal images.
- Apr/2004
 - Honors received during the IME-USP Graduation Exercise Ceremony, awarded to the best students of the Computer Science Program
- Dec/2003
 - Honorable mention for participation in the 11th SIICUSP (Scientific Initiation International Symposium of the University of Sao Paulo), presenting undergraduate work "Blood vessel segmentation in optic fundus images using wavelets and statistical classifiers".
- May/2003 - Dec/2003
 - FAPESP (Fundação de Amparo à Pesquisa do Estado de São Paulo) undergraduate research scholarship from a Brazilian state agency
- Mar/2003 - Apr/2003
 - CNPq (Conselho Nacional de Desenvolvimento Científico e Tecnológico) undergraduate research scholarship from a Brazilian federal agency

Service

- Reviewed journal papers for: IEEE Transactions on Medical Imaging (7), IEEE Transactions on Image Processing (2), IEEE Signal Processing Letters (2), Machine Vision and Applications (1), Computer Methods and Programs in Biomedicine (1), Computers in Biology and Medicine (1).
- Advised undergraduate students at the University of Maryland: Aditya Malik during his independent research studies, and Christine Chan for her College Park Scholars project.