

CURRICULUM VITÆ

NICOLAU LEAL WERNECK

Personal Data

Nicolau Leal Werneck
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Professional Outline

Electrical engineer specialized in computation, numerical analysis and geometry, and areas such as Computer Vision and Computational Intelligence.

Seeking to work with research and development. Great aptitude for programming and learning new technologies. Interested in science and multidisciplinary.

Advocate of free software and standards. User of GNU/Linux for 10+ years, and of computers in general since childhood.

Areas of Interest

Practical	Computer Vision / Mobile applications / Parameter estimation / High-Performance Computing / Information extraction.
Theoretical	Signal Processing / Pattern Recognition / Machine Learning / Probabilistic Modeling.

Objectives

Practical	Automate. Connect. Hack. Make. Implement demanding number-processing algorithms. Create useful Computer Vision and AI applications. Develop free software and open standards.
Theoretical	Use physics and geometry. Explore constraints. Reproduce human abilities with computers and robots. Analyze and synthesize natural entities, <i>e.g.</i> music, dance, paintings, furniture, cities.

Computer Science Knowledge

Platforms	GNU/Linux systems, specially Debian and Arch.
Programming	<i>Native:</i> Python, C. <i>Experienced:</i> Assembly, C++, bash, Matlab, Prolog. <i>Beginner:</i> JavaScript, Mathematica, Perl, Lua, LISP, Fish.
Libraries	Numpy, OpenCV, OpenGL, Qt, ALSA.
Programs	Emacs, Inkscape, MongoDB, Awesome, mplayer, Apache.
Miscellaneous	AWS, \LaTeX , dbus, player/stage.

Human Language Knowledge

Native: Portuguese

Experienced: English

Beginner: Japanese, French

Other Knowledge

{Probability, Information, Number, Network} Theory, Optimization, Reinforcement Learning, Cryptography, Cinema, Music, History of art and science, Psychophysics, Do-it-yourself electronics.

Education

- 2007–2012 Doctorate in Electrical Engineering
Universidade do Estado de São Paulo — USP
720 hours of classes, mean grade 97.5%.
—Developed a monocular vision method to estimate orientation in a Manhattan world environment. It works with distorted images and uses M-estimation, RANSAC and FilterSQP.
- 2005–2007 Masters in Electrical Engineering
Universidade Estadual de Campinas — UNICAMP
810 hours of classes, mean grade 96.7%.
—Studied the electric guitar, from its signal production and non-linear dynamics of strings all the way to timbre perception.
- 1999–2004 Graduation in Electrical Engineering
Universidade Federal de Minas Gerais — UFMG
3,495 hours of classes, mean grade ~70%.
—Worked at the CEFALA lab with acoustics, speech, Signal Processing, Pattern Recognition and Computer Graphics.

Professional Activities

- Geekie** Ed-tech start-up, develops an adaptive learning platform.
- 11/2012–now *Position: Software Engineer, Intelligence team*
—Developed non-linear regression software related to Item Response Theory. Implemented new code to estimate item parameters, making the process more reliable and much faster than what was available to the company before.
—Implemented a constrained local search algorithm for the balanced incomplete block design problem.
—Developing tools for problems such as study recommendation to students, log analysis and business analytics.
- Google Inc.** Books project.
- Q3/2011 *Position: Software Engineering intern*
—Developed a technique to fit isometric mappings (developable surfaces) to 3D range data to dewarp pictures of open books.
—Contributions to other pattern recognition projects: 1D signal phase estimation, camera orientation estimation.
- USP** LTI/PCS, Dept. of Computer and Digital Systems Engineering.
- 2007–2011 *Position: Teaching intern*
—Elaborated tests and didactic material.
—Supervision of undergrads on the construction of a Theremin instrument and some mobile robotics and vision projects.

Excegen S.A. Brazilian biochemical R&D startup company.

Q3–Q4/2004 *Position: Engineering intern*
 —Developed a probabilistic classifier to predict weight gain of bovines from genetic data. (C++ code.)

Portfolio

Journal articles **Corisco: Robust edgel-based orientation estimation for generic camera models**, Nicolau Werneck and Anna Helena Realí Costa. Image and Vision Computing, 2013. <http://dx.doi.org/10.1016/j.imavis.2013.10.004>

Mapping with monocular vision in two dimensions, Nicolau Werneck and Anna Helena Realí Costa. International Journal of Natural Computing Research 1(4), 2010. <http://dx.doi.org/10.4018/978-1-4666-1574-8.ch022>

Event articles **Speeding up probabilistic inference of camera orientation by function approximation and grid masking**, Nicolau Werneck and Anna Helena Realí Costa. 19th WSCG, Czech Republic, 2011.

Monocular visual mapping with the Fast Hough Transform, Nicolau Werneck and Anna Helena Realí Costa. VI Workshop de Visão Computacional, 2010.

Medição de distância e altura de bordas horizontais com visão monocular linear para robôs móveis, N. Werneck, F. Truzzi and A. H. R. Costa. V Workshop de Visão Computacional, 2009.

Observação de acoplamentos entre modos de vibração ortogonais em uma guitarra elétrica, Nicolau Werneck and Furio Damiani. 11th Brazilian Symposium on Computer Music, 2007.

Software projects **corisco**, a method to estimate camera orientation from a single picture (*doctorate research*), 2012. <http://goo.gl/0745pQ>

featherweight, initial development of a method to fit a developable surface to a 3D point cloud in order to dewarp pictures of open books (*internship project*), 2011. <http://goo.gl/aXsDY>

Misc *A Linux webcam driver patch*, 2010. <http://goo.gl/rZDbk>

Sequence A140261 on OEIS, 2008. <http://oeis.org/A140261>

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