Francisco Blanco-Silva

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Education

Ph.D. in Mathematics August 2007
Purdue University, West Lafayette, Indiana, USA.
Dissertation topic:
The Curvelet Transform—Generalized Definition and Approximation Properties

Skills

Programming Languages/Computer and OS:
Wrote the technical book *Learning SciPy for Numerical and Scientific Computing*. Packt Publishing, 2013. (`www.packtpub.com/learning-scipy-for-numerical-and-scientific-computing/book`)

Proficient in AWK/GAWK, BASIC, Bourne/Unix shell (including bash, csh, tcsh, ksh and zsh), C/C++/Objective-C/CoCoa, Caml/OCaml, CSS, Lisp/Common Lisp/Emacs Lisp/Scheme, Fortran, julia, HTML, Magma, Maple, Mathematica, MATLAB, Maxima, MPI, Octave, Pascal, Perl, PHP, Python, R, Ruby, sed, asciidocs, TEX/LATEX, markdown

Proficient in Ubuntu and RPM-based Linux; Windows 9x, XP, Vista, 7-8; Mac OS X; UNIX; Virtualization of Windows and Linux guests using VMWare; OS installations (dual and triple boot)

Recent Work Experience

Owner Tizona Scientific Solutions LLC July 2011 – present

Research Assistant Professor August 2007 – August 2010
Instructor August 2011 – present
Interdisciplinary Mathematics Institute and Department of Mathematics. University of South Carolina

- Research on systematic approaches to extracting high resolution information from HAADF–STEM images which will be beneficial to the characterization of beam sensitive materials
- Research on the development of multiresolution formulated algorithms to enable high compression rates using non-linear approximation methods, enhanced procedures for Hausdorff metric estimation, and the efficient structures for organization of digital urban terrain data.
- Developed parallel code to perform super-resolution of timeframes of micrographs in both `Matlab`, and `C/C++` with the `CImg` libraries. The codes were run in a 16-processor `UNIX` machine property of the IMI, and a 272 core parallel computational cluster property of the University of South Carolina

Graduate Student and Teaching Assistant August 1999 – August 2007
Department of Mathematics, Purdue University.

- Wrote triangulation code for Numerical Partial Differential Equations in `scheme` (`www.math.purdue.edu/~lucier/615-2000/abstract.pdf`)
- Colaborated with C. Rizcalla and S. Gruver to produce a scientific paper on epidemiology, studying the impact of ebola on different populations. Wrote the codes that performed the numerical simulations for this model in `C/C++`, and run them in a 4-processor `UNIX` machine
- Developed code in `scheme` to build a computer system to perform "Homework on the Web" applications. (`www.math.purdue.edu/about/purview/summer2005.pdf`)
- Developed a series of scripts in `OCaml` to compute and manipulate wavelet coefficients of 1 and 2-D signals. Applied to perform high-level image processing (denoising, edge detection, etc)
- Developed a series of scripts in `python` to solve a problem in kinetics of networks of enzymatic reactions. The scripts allow input of a single enzyme, and retrieval of all possible networks in which the enzyme is present (from the online databases at `www.enzyme-database.org`) One is also able to input the initial concentration of substrates present in the chemical reactions, and the codes will compute the concentration of all components at any given time. The computations were usually performed by two multiprocessing systems: a 4-processor `UNIX` machine property of the Department of Mathematics of Purdue University.

Additional Relevant Experience

Universidad Complutense de Madrid 1998
Developed a simple system for Mechanical Geometry Theorem Proving in `Maple`. The system allows a computer to prove the validity of conjectures in plane Euclidean Geometry, thus potentially offering proofs to Theorems. Wrote a research article on this subject