CARLOS D. CORREA, Ph.D

Computer Scientist | cdcorrea@gmail.com | http://www.carloscorrea.com

PROFILE

Computer Scientist in the fields of Computer Graphics, Video Processing and Information Visualization, interested in positions that require outstanding analytical, programming and research skills in the development of new and efficient ways of generating, analyzing and visualizing large data.

EDUCATION

University of California, Davis — Postdoctoral Scholar, Computer Science, 2010

Rutgers University, New Jersey — Ph.D., Electrical and Computer Engineering, 2007

Rutgers University, New Jersey — M.Sc., Electrical and Computer Engineering, 2003

EAFIT University, Colombia — B.Sc., Computer Science, 1998

EXPERIENCE

Computer Scientist.
Center for Applied Scientific Computing, Lawrence Livermore National Lab. May 2011 – present

- Design new diagrams to visualize statistical data and uncertainty.
- Develop robust techniques for clustering, analysis and regression of multi-dimensional data.
- Develop robust algorithms for large-scale 3D reconstruction of persistent aerial video.

Postdoctoral Researcher.
Center for Applied Scientific Computing, Lawrence Livermore National Lab. May 2010 – Apr. 2011

- Developed novel visual representations of large ensembles of multi-dimensional data.
- Created novel techniques for quantifying and visualizing uncertainty in high-dimensional data sets.

Postdoctoral Researcher.
Visualization and Interface Design Innovation Lab and The Institute for Ultrascale Visualization. University of California, Davis. Sep. 2007 - April. 2010.

- Authored software for creating compelling illustrations and narratives from video clips.
- Created mathematical frameworks to represent data transformations for Visual Analytics.
- Authored *netzen*, a software tool for visualization and analysis of social and information networks.
- Developed a GPU-based image processing pipeline for the analysis and classification of 3D images.

Research Assistant.
Center for Advanced Information Processing, Rutgers University, New Brunswick, NJ. Jan. 2001 - May 2007.

- Coined the term *illustrative deformation* as a new rendering technique to generate illustrations from scientific data.
- Developed and optimized a software pipeline to deform and animate large 3D images, using innovative computer graphics algorithms and exploiting GPU parallel computing capabilities.
- Created novel algorithms, user interaction tools and middleware components for distributed virtual environments in a variety of platforms and mobile devices.

SKILLS

Computer Graphics and Image Processing

OpenGL, GPU programming (Cg, GLSL), Java3D, VTK, Matlab, OpenCV, Digital Signal Processing.

Video Processing

Visual summaries of video, image stitching and composition, GPU-enabled image processing, 3D reconstruction from images.

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Data Analysis and Visualization

Data Mining, Spectral Clustering, Visual Analytics, Quantitative Analysis, Sensitivity Analysis and Uncertainty, Network analysis, Numerical Methods, Optimization.

Programming

Object oriented programming, C/C++, Java, Python, GPU-based parallel computing, GUI programming (Qt, FLTK, Java), Design patterns, Distributed and parallel programming.

Operating Systems

Linux, Windows, Mac OS, UNIX.

SELECT PUBLICATIONS

(Google Scholar link: http://scholar.google.com/citations?user=-Km_NFkAAAAJ)

- Locally-Scaled Spectral Clustering with Empty Region Graphs. Carlos D. Correa and Peter Lindstrom. To Appear in: ACM SIGKDD Intl. Conference on Knowledge Discovery and Data Mining, KDD 2012.
- Towards Robust Topology of Sparsely Sampled Data (Best paper award). Carlos D. Correa and Peter Lindstrom. IEEE Trans. on Visualization and Computer Graphics, vol. 17, no. 12, Dec. 2011.
- Visualizing Social Networks. Carlos D. Correa and Kwan-Liu Ma. In Social Network Data Analytics. Ed. Charu Aggarwal, Springer (2011).
- Visual Reasoning about Social Networks using Centrality Sensitivities. Carlos D. Correa, Tarik Crnovrsanin and Kwan-Liu Ma. IEEE Transactions on Visualization and Computer Graphics, 2011.
- A Rendering Framework for Multi-Scale Views of 3D Models. Wei-Hsien Hsu, Kwan-Liu Ma and Carlos D. Correa. ACM Transactions on Graphics, Vol. 30 Issue 5. (Proc. ACM SIGGRAPH Asia 2011).
- Dynamic Video Narratives. Carlos D. Correa and Kwan-Liu Ma. ACM Transactions on Graphics 29(4), (ACM SIGGRAPH 2010).
- The Occlusion Spectrum for Volume Visualization and Classification. Carlos D. Correa and Kwan-Liu Ma. IEEE Trans. on Visualization and Computer Graphics, vol. 15, 2009.
- A Framework for Uncertainty-Aware Visual Analytics. Carlos D. Correa, Yu-Hsuan Chan and Kwan-Liu Ma. To Appear: IEEE VAST 2009 Symposium, 2009
- Visualizing what Lies Inside. Carlos D. Correa. VisFiles, ACM SIGGRAPH Computer Graphics Quarterly, Volume 43, Number 2, May 2009.
- Size-based Transfer Functions: A New Volume Exploration Technique. Carlos D. Correa and Kwan-Liu Ma. IEEE Trans. on Visualization and Computer Graphics, vol. 14, no. 6, pp. 1380-1387, 2008.

AWARDS

- Best paper award. IEEE Visualization conference, 2011.
- Finalist Big Bang! UC Davis Business Plan Competition, 2011.
- Co-PI of NSF Award. “Modeling the Uncertainty Due to Data/Visual Transformations Using Sensitivity Analysis”, 2010 - 2012.
- Co-PI of the project “Visual Analytics Tools for Enterprise Information Management”, recognized with a 2008 Innovation Research Award from HP Labs.
- VAST Challenge Award for Intuitive Social Network Graphs, 2008.

ACTIVITIES

- International Program Committee Member: IEEE Visualization 2011-2012, IEEE Pacific Visualization Symposium 2010-2012, 2011, EuroVis 2012, VisApp 2011-2012.
- Reviewer for leading journals and conferences in computer graphics and image processing, including ACM SIGGRAPH, IEEE Trans. Visualization and Computer Graphics, Computer Graphics Forum, and IEEE Transactions in Multimedia.