

Carlos A. Vanegas

Graduate Student and Research Assistant
Department of Computer Science
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Career Goal

Conduct research that advances the state of the art in Computer Graphics and Computational Geometry.

Education

Ph.D. Student (Expected May 2012)
Department of Computer Science, Purdue University, West Lafayette, IN, USA.

B.Sc. Mathematical Engineering (June 2007)
(11-Semester Diplom Program in Applied Mathematics) EAFIT University, Medellín, COLOMBIA.
(Ranking: 2 out of 148)

Experience

Department of Computer Science, (Jul 2007-Present)
Purdue University, West Lafayette, IN, USA
Graduate Research Assistant, Computer Graphics and Visualization Lab
Advisor: Prof. Daniel Aliaga (Ph.D., Univ. of North Carolina at C-H, 1999)
Projects: Urban Modeling and Visualization (<http://www.cs.purdue.edu/cgvlab/projects/urban.shtml>)

EAFIT University, Medellín, COLOMBIA (Jan 2004-Jul 2007)
Undergraduate Research Assistant, CAD/CAM/CAE Laboratory
Advisor: Prof. Oscar E. Ruiz (Ph.D., Univ. of Illinois at U-C, 1995)
Projects: i) Interactive environment and language for processing 3D digitizations (DigitLAB). ii) Deterministic and stochastic algorithms for curve and surface reconstruction. iv) Stochastic geometry application for determining wear regions in cylindrical surfaces.

University of Vigo, Vigo, SPAIN (Feb-Jul 2006)
Visiting Research Assistant, Department of Industrial Engineers
Advisor: Prof. Xoan A. Leiceaga (Ph.D., U. Politécnica de Madrid, 1984)
Project: Implementation of a mobile crane simulator for operator training.

University of Vigo, Vigo, SPAIN (Jan-Jul 2005)
Visiting Research Assistant, Department of Industrial Engineers
Advisor: Prof. Xoan A. Leiceaga (Ph.D., U. Politécnica de Madrid, 1984)
Project: Implementation of a software package for Design, Analysis and Manufacturing of Ship Hulls.

Smithsonian NM of Natural History, Washington, DC, USA (Dec 2003)
Visiting Student, Department of Mineral Sciences, Global Volcanism Program
Description: Revision and Translation (English-Spanish) of summaries on volcanoes of the Americas.

EAFIT University, Medellín, COLOMBIA

(Jan-Dec 2003)

Research Assistant, Department of Geology

Advisor: Prof. Juan D. Restrepo (Ph.D., University of South Carolina, 2001)

Description: Statistical Analysis of Hydrologic Time Series (El Niño Water and Sediment discharge).

Publications

Refereed Papers

C. Vanegas, D. Aliaga, B. Benes, P. Waddell, "Interactive Design of Urban Spaces using Geometrical and Behavioral Modeling", **ACM Transactions on Graphics** (also in Proceedings **SIGGRAPH Asia**), 28(5), 2009.

C. Vanegas, D. Aliaga, P. Mueller, P. Waddell, B. Watson, P. Wonka, "Modeling the Appearance and Behavior of Urban Spaces", **Computer Graphics Forum** (also in Eurographics 2009 State-of-the-Art Reports), (to appear) 2009.

C. Vanegas, D. Aliaga, B. Benes, P. Waddell, "Visualization of Simulated Urban Spaces: Inferring Parameterized Generation of Streets, Parcels, and Aerial Imagery", **IEEE Transactions on Visualization and Computer Graphics**, 15(3):424-435, 2009.

D. Aliaga, C. Vanegas, B. Benes, "Interactive Example-Based Urban Layout Synthesis", **ACM Transactions on Graphics** (also in Proceedings **SIGGRAPH Asia**), 27(5), 2008.

D. Aliaga, B. Benes, C. Vanegas, N. Andryscio, "Interactive Reconfiguration of Urban Layouts", **IEEE Computer Graphics and Applications** (Special Issue on Urban Modeling), 28(3):38-47, 2008.

O. Ruiz, C. Vanegas C, "Statistical Assessment of Global and Local Cylinder Wear", **IEEE International Conference on Industrial Informatics**, 1:387-392, 2007.

O. Ruiz, C. Vanegas, C. Cadavid, "Principal Component and Voronoi Skeleton alternatives for curve reconstruction from noisy point sets", **Journal of Engineering Design**, 18(5):437-457, 2007.

X. Leiceaga, O. Ruiz, C. Vanegas, M. Rodríguez, J. Prieto, E. Soto, "Bi-Curve And Multi-Patch Smoothing with Application to the Shipyard Industry", **Congresso XVI ADM-XIX INGEGRAF**, 1:415-424, 2007.

O. Ruiz, C. Vanegas, "Piecewise Linear Curve Reconstruction from Point Clouds", **TMCE** (Tools and Methods of Competitive Engineering), 1:285-298, 2006.

Manuscripts

C. Vanegas, "Applications of Computational Geometry to Computer Aided Design and Manufacturing", EAFIT University B.Sc. Thesis with Honors, Advisor: Prof. Oscar E. Ruiz, June, 2007.

Teaching Experience

Department of Computer Science, Purdue University, West Lafayette, IN, USA.

Teaching Assistant

CS334: Fundamentals of Computer Graphics

(Spring 2008)

CS240: Programming in C

(Fall 2007)

Department of Mechanical Engineering, EAFIT University, Medellín, COLOMBIA

Teaching Assistant

IMo24: Introduction to CAD/CAM Systems

(Spring, Summer 2004)

Distinctions and Awards

Purdue Computing Research Institute Special Incentive Research Assistantship, 2009

Purdue College of Science Graduate Student International Travel Grant, 2009.

Purdue LAFASA Outstanding Student Poster Presentation Award, 2008.

Purdue Research Foundation Assistantship, 2008.

Procter & Gamble *Prest&Gio* Award, 2006. Undergraduate scholarship and career opportunity within the company, granted by Procter & Gamble to 21 (among 1500 pre-selected) undergraduate students in Colombia, based on their “outstanding academic performance and excellent leadership capabilities”.

Research Internship Award, 2005, 2006. Granted by the European Union through INTERREG funds, to carry out research for the shipyard industry in Galicia and northern Portugal.

ACM Certificate of Achievement, 2005, 2006. Awarded by ACM for participating in the 2005 and 2006 ACM International Collegiate Programming Contest (ICPC) South America.

Honor Scholarship, 2002. Awarded by EAFIT University to the student with the highest GPA in each undergraduate program.

Andrés Bello Scholarship (Physics), 2001. Awarded by the Ministry of Education of Colombia to top 0.05% scores in each subject area of the ICFES test for high school graduates. Received full scholarship covering tuition expenses for the duration of undergraduate studies.

First Place, EAFIT University Mathematics and Physics Contest, 2001. Awarded full scholarship for first undergraduate semester.

Service

Student Representative, Purdue AMIGOS Association.

Conferences Attended

SIGGRAPH 2009 – New Orleans, Louisiana, August 3-7, 2009.

Eurographics 2009 – Munich, Germany, March 30-April 3, 2009. (Presenter)

SIGGRAPH Asia 2008 – Singapore, Decemeber 10-13, 2008. (Presenter)

SIGGRAPH 2008 - Los Angeles, California, August 11-15, 2008.

SIGGRAPH 2007 - San Diego, California, August 5-9, 2007.

Congresso XVI ADM - XIX INGEGRAF, Perugia, Italy, June 6-9, 2007. (Presenter)

Research Interests

Computer Graphics: Interactive Modeling and Visualization of Urban Spaces, Procedural Modeling, Shape Reconstruction, Applied Stochastic Geometry.

Others: Mathematical Modeling of Physical Processes, Urban Planning, Geographic Information Systems, Dynamical Systems and Control.

Programming Skills

C/C++, OpenGL, Graphics programming, TCP and network programming, Windows, UNIX, MATLAB.

Languages

English: Fluent (115/120 TOEFL iBT), **Spanish:** Native, **French:** Advanced, **German:** Basic