

# Carlos A. Vanegas

Graduate Student and Research Assistant  
Department of Computer Science, **Purdue University**  
West Lafayette, IN, USA

[cvanegas@purdue.edu](mailto:cvanegas@purdue.edu), [cavanegas@gmail.com](mailto:cavanegas@gmail.com)  
<http://www.cs.purdue.edu/homes/cvanegas/>  
Tel: +1 (765) 409-9226

## Career Goal

Conduct research that advances the state-of-the-art in Computer Graphics and Computational Geometry, and its applications in multidisciplinary domains.

## Education

- 2007 - present:** **Ph.D. Student** in Computer Science, **Purdue University**, USA. (Expected: May 2012)  
**2002 - 2007:** **B.Sc.** in Mathematical Engineering, **EAFIT University**, COLOMBIA. (Ranking: 2 of 148)

## Experience

- Jul 2007 - present:** Research Assistant, Department of Computer Science, **Purdue University**, USA  
*Group:* Computer Graphics and Visualization Lab. *Advisor:* Prof. Daniel Aliaga.  
*Project 1:* Development, in collaboration with **UC Berkeley**, of **UrbanVision**, an open-source platform for representation and simulation of future urban landscapes. **Currently deployed for use by major planning agencies in the San Francisco Bay area.**  
*Project 2:* Urban Modeling and Visualization (<http://www.cs.purdue.edu/cgvlab/projects/urban.shtml>)
- Feb 2010 - Jul 2010:** Visiting Graduate Research Assistant, **ETH Zürich**, Zürich, SWITZERLAND  
*Group:* Chair for information architecture. *Advisor:* Prof. Gerhard Schmitt.
- Feb 2010 - Jul 2010:** Intern Software Engineer, **Procedural Inc.**, Zürich, SWITZERLAND  
*Mentor:* Pascal Müller. *Project:* Participation in the development of the CityEngine.
- Jan 2004 - Jul 2007:** Undergraduate Research Assistant, **EAFIT University**, COLOMBIA  
*Group:* CAD/CAM/CAE Laboratory. *Advisor:* Prof. Oscar E. Ruiz.
- Jan-Jul 2005, 2006:** Visiting Undergraduate Research Assistant, **University of Vigo**, SPAIN  
*Group:* Department of Industrial Engineers. *Advisor:* Prof. Xoan A. Leiceaga
- Jan - Dec 2003:** Undergraduate Research Assistant, **EAFIT University**, COLOMBIA  
*Group:* Department of Geology. *Advisor:* Prof. Juan D. Restrepo.

## Distinctions and Awards

- 2010:** Purdue Computing Research Institute Special Incentive Research Assistantship.  
**2009:** Purdue College of Science Graduate Student International Travel Grant.  
**2008:** Purdue LaFaSA Outstanding Student Poster Presentation Award.  
**2008:** Purdue Research Foundation Assistantship.  
**2006:** Procter & Gamble *Prest&Gio* Award. Academic and leadership scholarship.  
**2005, 2006:** Research Internship Award. Granted by the European Union through INTERREG funds.  
**2005, 2006:** ACM Certificate of Achievement. Participation in the ICPC South America.  
**2002:** Honor Scholarship. Awarded by EAFIT University to the student with the highest GPA.  
**2001:** Andrés Bello Undergraduate Scholarship (Physics). 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.  
**2001:** First Place, EAFIT University Mathematics and Physics Contest, 2001.

## Publications

1. **C. Vanegas**, D. Aliaga, B. Benes, "Automatic Extraction of Manhattan-World Building Masses from 3D Laser Range Scans", **IEEE Transactions on Visualization and Computer Graphics**, to appear, **2012**.
2. **C. Vanegas**, T. Kelly, B. Weber, J. Halatsch, D. Aliaga, P. Müller, "Procedural Generation of Parcels in Urban Modeling", **Computer Graphics Forum** (Proceedings Eurographics), **2012**.
3. D. Aliaga, **C. Vanegas**, M. Lei, D. Niyogi, "Visualization-based Decision Tool for Urban Meteorological Modeling", **Environment and Planning B**, to appear, **2012**.

4. B. Benes, M. Abdul, P. Jarvis, D. Aliaga, **C. Vanegas**, "Urban Ecosystems", **ACM SIGGRAPH Symposium on Interactive 3D Graphics and Games**, 2011.
5. O. Ruiz, **C. Vanegas**, C. Cadavid, "Ellipse-based Principal Component Analysis for Self-intersecting Curve Reconstruction from Noisy Point Sets", **The Visual Computer Journal**, 2011.
6. Antje Kunze, Jan Halatsch, **Carlos A. Vanegas**, Martina Jacobi, Benamy Turkienicz, Gerhard Schmitt, "A Conceptual Participatory Design Framework for Urban Planning", **eCAADe Conference**, 2011.
7. **C. Vanegas**, D. Aliaga, B. Benes, "Building Reconstruction using Manhattan-World Grammars", **IEEE Computer Vision and Pattern Recognition (CVPR)**, 358-365, (oral presentation and proceedings), 2010.
8. **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 Report), 29(1), 2010.
9. **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.
10. **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.
11. D. Aliaga, **C. Vanegas**, B. Benes, "Interactive Example-Based Urban Layout Synthesis", **ACM Transactions on Graphics** (Proceedings **SIGGRAPH Asia**), 27(5), 2008.
12. 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.
13. 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.
14. O. Ruiz, **C. Vanegas**, "Statistical Assessment of Global and Local Cylinder Wear", **IEEE International Conference on Industrial Informatics**, 1:387-392, 2007.
15. 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 ADM- INGEGRAF**, 1:415-424, 2007.
16. O. Ruiz, **C. Vanegas**, "Piecewise Linear Curve Reconstruction from Point Clouds", **TMCE (Tools and Methods of Competitive Engineering)**, 1:285-298, 2006.

## Programming Skills

C/C++, Java, OpenGL, Qt, Boost libraries, TCP and network programming, Windows, UNIX, MATLAB.

## Teaching Experience

**Spring 2008:** Teaching Assistant, Fundamentals of Computer Graphics (CS334), **Purdue University**  
**Fall 2007:** Teaching Assistant, Programming in C (CS240), **Purdue University**  
**Spring/Summer 2004:** Teaching Assistant, Introduction to CAD/CAM Systems (IMo24), **EAFIT University**

## Languages

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

## Service

**Paper Reviewer** for ACM SIGGRAPH Asia, IEEE Visualization, IEEE TVCG, ACM I3D, Computer Graphics Forum, Computers & Graphics, ISVC

**Academic Program Coordinator** for Bogota ACM SIGGRAPH 2011

**Student Representative** for Purdue AMIGOS Association

## Interests

**Computer Graphics:** Procedural and image-based modeling and visualization of urban spaces

**Others:** Urban Simulation, Urban Planning, Geographic Information Systems, Dynamical Systems and Control.

**Hobbies:** Classical Piano, Traveling, Geography, Photography, Tennis