Daniel G. Aliaga

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1. Research Interests

Dr. Aliaga's is a pioneering researcher in the area of *urban visual computing* which includes disciplines such as computer graphics, computer vision, and strong multi-disciplinary collaborations outside of computer science. Activities are divided into three groups: a) pioneer of urban inverse procedural modeling and urban deep generative modeling to facilitate semi-automatic controllable content creation; b) leading work in the multi-disciplinary area of urban modeling and simulation creating novel urban artificial intelligence and visual computing tools; and c) novel image processing and image-based 3D reconstruction methods. Aliaga's urban modeling work is particularly focused at digital city planning applications that provide innovative "what-if" design tools enabling urban stake holders from cities worldwide to automatically integrate, process, analyze, and visualize the complex interdependencies between the urban form, function, and the natural environment.

2. Academic Appointments

- Associate Professor of Computer Science, Purdue, West Lafayette, IN, August 2010-present.
- Visiting Professor at Department of Computer Science in King Abdullah University of Science and Technology (KAUST), Saudi Arabia, July 2018-December 2018.
- Visiting Researcher at INRIA (French Computer Science/Computer Graphics Research Institute), France, July 2015.
- Visiting Professor at Department of Computer Science, ETH Zurich, July – November 2011.
- Visiting Professor at Chair for Information Architecture, Department of Architecture, ETH Zurich, January – November 2011.
- Assistant Professor of Computer Science, Purdue, West Lafayette, IN, August 2003-2010.
- Research Scientist, Dept. of Computer Science, Princeton, January 2003 - August 2003.
- Ph.D., Computer Science, University of North Carolina at Chapel Hill, May, 1999.
  Thesis: "Automatically Reducing and Bounding Geometric Complexity"
  Advisor: Professor Anselmo Lastra
- M.S., Computer Science, University of North Carolina at Chapel Hill, December, 1993.
  Thesis: "Virtual and Real Object Collisions in a Merged Environment"
  Advisor: Professor Henry Fuchs
- B.Sc., Computer Science, Magnum Cum Laude, Brown University, May, 1991.
  Honor's Thesis: "Transaction-Based Distributed Computer Graphics Systems"
  Advisor: Professor Andries van Dam

3. Industrial Positions

- Member of Technical Staff, Image and Video Processing Lab, November 1998-December 2002, Lucent Technologies Bell Laboratories, Murray Hill, NJ.
- Intern, June 1995 – August 1995, Silicon Graphics Inc., Mountain View, CA.
- Software Developer, June 1994 – August 1994, Division Inc, Chapel Hill, NC.
- Intern, June 1992 – August 1992, Siemens Corporate Research Lab, Munich, Germany.
- Intern, June 1991 – August 1991, IBM, Boca Raton, FL.
- Intern, June 1989 – August 1989, IBM, Boca Raton, FL.
- Intern, June 1988 – August 1988, Siemens USA, Boca Raton, FL.
- Intern, June 1987 – August 1987, Siemens USA, Boca Raton, FL.

4. Publications

Published Journal Articles

1. **Aliaga, D**., Niyogi, D. Digitizing cities for urban weather: representing realistic cities for weather and climate simulations using computer graphics and artificial intelligence. *Computational Urban Science.* Vol. 4, Article 8, 2024, doi: 10.1007/s43762-023-00111-z.
2. H. Kamath, M. Singh, N. Malviya, A. Martilli, L. He, **D. Aliaga**, C. He, F. Chen, L. Magruder, Z.L. Yang, D. Niyogi. GLObal Building heights for Urban Studies (UT-GLOBUS) for city- and street- scale urban simulations: Development and first applications, *Nature Scientific Data*, 11, 886, 15 pp., 2024.
3. B. Thapa, L. Darling, D. Choi, C. Ardohain, A. Firoze, **D. Aliaga**, B. Hardiman, S. Fei. Application of multi-temporal satellite imagery for urban tree species identification, *Urban Forestry & Urban Greening*, Vol. 98, 10pp, 2024.
4. P. Patel, R. Kalyanam, L. He, **D. Aliaga**, D. Niyogi. Deep Learning based Urban Morphology for City-scale Environmental Modeling, *Proceedings of the National Academy of Sciences (PNAS) Nexus*, 2023.
5. C. May, **D. Aliaga.** CubeGAN: Omnidirectional Image Synthesis Using Generative Adversarial Networks, *Computer Graphics Forum (CGF), also Eurographics*, 2023.
6. L. He, J. Shan, **D. Aliaga.** Generative Building Feature Estimation from Satellite Images, *IEEE Transactions on Geoscience and Remote Sensing (TGRS)*, 2023.
7. P. Patel, K. Ankur, S. Jamshidi, A. Tiwari, R. Nadimpalli, N.K.R. Busireddy, S. Safaee3, K. K. Osuri, S. Karmakar, S. Ghosh, **D. Aliaga**, J. Smith, F. Marks, Z. Yang, D. Niyogi. Impact of Urban Representation on Simulation of Hurricane Rainfall, *Geophysical Research Letters*, 2023.
8. M. Yoshi, **D. Aliaga**, J. Teller. Predicting Urban Heat Island Mitigation with Random Forest Regression in Belgian Cities, *Journal: Intelligence for Future Cities*, The Urban Book Series, Springer Nature, pp. 305-323, 2023.
9. X. Zhang, **D. Aliaga.** Procedural Roof Generation From a Single Satellite Image, *Computer Graphics Forum (CGF), also Eurographics*, 41:2, 2022.
10. X. Zhang, **D. Aliaga.** RFCNet: Enhancing Urban Segmentation using Regularization, Fusion, and Completion, *Computer Vision and Image Understanding (CVIU),* 220:C, 12 pages, July, 2022.

11. P. Patel, S. Jamshidi, R. Nadimpalli, **D. Aliaga**, G. Mills, F. Chen, M. Demuzere, D. Niyogi. Modeling Large-Scale Heatwave by Incorporating Enhanced Urban Representation, *Journal of Geophysical Research: Atmospheres*, 127:2, 2022.
12. A. Firoze, B. Benes, **D. Aliaga**, Urban Tree Generator: Spatio-Temporal and Generative Deep Learning for Urban Tree Localization and Modeling, *The Visual Computing Journal, also CGI*, 38:3327-3339, 2022.
13. X. Zhang, W. Ma, G. Varinlioglu, N. Rauh, **D. Aliaga.** Guided Pluralistic Building Contour Completion, *The Visual Computer Journal, also CGI*, 38:3205-3216, 2022.
14. Z. Xu, M. Oliveira, **D. Aliaga.** Preemptive Text Warping to Prevent Appearance of Motion Blur, *The Visual Computer Journal, also CGI*, 38:3391-3403, 2022.
15. P. Patel, S. Karmakar, S. Ghosh, **D. Aliaga**, D. Niyogi. Impact of green roofs on heavy rainfall In tropical, coastal urban area, *Environmental Research Letters (ERL)*, 16(7), 2021.
16. X. Zhang, A. Shehata, B. Benes, **D. Aliaga**, Automatic Deep Inference of Procedural Cities from Global-Scale Spatial Data, *ACM Trans. on Spatial Algorithms and Systems*, 28 pages, 7(2), 2021.
17. C. May, M. Oliveira, **D. Aliaga**, Video Folding: Increased Framerate for Semi-Repetitive Sequences, *IEEE Transactions on Visualization and Computer Graphics (TVCG)*, 27(10), 3900-3912, Oct, 2021.
18. C.D.T. Mathew, B. Benes, **D. Aliaga**, An output-driven approach to design a swarming model for architectural indoor environments, *Computers & Graphics*, 87:103-110, 2020.
19. G. Nishida, A. Bousseau, **D. Aliaga**, Multi-pose Interactive Linkage Design, *Computer Graphics Forum (CGF), also Eurographics*, 38:2, 13 pages, 2019.
20. J. Ching, **D. Aliaga**, G. Mills, V. Masson, L. See, M. Neophytou, A. Middel, A. Baklanov, C. Ren, E. Ng, J. Fung, M. Wong, Y. Huang, A. Martilli, O. Brousse, I. Stewart, X. Zhang, A. Shehata, D. Niyogi, Pathway using WUDAPT's Digital Synthetic City tool towards generating urban canopy parameters for multi-scale urban atmospheric modeling, *Urban Climate*, 28(100459), 23 pp., 2019.
21. T. Mathew, P. Knob, S. Musse, **D. Aliaga**, Urban Walkability Design using Virtual Population Simulation, *Computer Graphics Forum (CGF)*, 38(1), 455-469, 2019.
22. G. Nishida, A. Bousseau, **D. Aliaga**, Procedural Modeling of a Building from a Single Image, In *Computer Graphics Forum (CGF), also Eurographics*, 37:2, 15 pages, 2018.
23. A. Mustafa, X. Zhang, G. Nishida, M. Bruwier, B. Dewals, J. Teller, **D. Aliaga**, Procedural Generation of Flood-Sensitive Urban Layouts, *Environment and Planning B: Urban Analytics and City Science*, 15 pages, November, 2018.
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25. I. Demir, **D. Aliaga**, Guided Proceduralization: Optimizing geometry processing and grammar extraction for architectural models, *Computers & Graphics*, 11 pages, May, 2018.

26. I. Demir, **D. Aliaga**, B. Benes, Near-Convex Decomposition and Layering for Efficient 3D Printing, *Additive Manufacturing*, Vol. 21, May, 2018.
27. M. Bruwiera, A. Mustafa, **D. Aliaga**, P. Archambeau, S. Erpicum, G. Nishida, X. Zhang, M. Pirotton, J. Teller, B. Dewals, 2018. Influence of urban pattern on inundation flow in floodplains of lowland rivers, *Science of the Total Environment*, Vol. 622–623, 446–458.
28. I. Garcia-Dorado, **D. Aliaga**, P. Bhalachandran, P. Schmid, D. Niyogi, Fast Weather Simulation for Inverse Procedural Design of 3D Urban Models, *ACM Transactions on Graphics (TOG)*, 36(2), #21, 19 pages, 2017.
29. G. Nishida, I. Garcia-Dorado, **D. Aliaga**, B. Benes, A. Bousseau, Interactive Sketching of Urban Procedural Models, *ACM Transactions on Graphics (TOG)*, 35(4), #130, 11 pages, 2016.
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36. I. Garcia-Dorado, I. Demir, **D. Aliaga**, Automatic Urban Modeling using Volumetric Reconstruction with Surface Graph Cuts. *Computers & Graphics*, 37, 896-910, 2013.
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38. **D. Aliaga**, C. Vanegas, M. Lei, D. Niyogi. Visualization-based Decision Tool for Urban Meteorological Modeling, *Environment and Planning B: Planning and Design (EPB)*, 40(2), 271-288, 2013.
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43. C. Vanegas, T. Kelly, B. Weber, J. Halatsch, **D. Aliaga**, P. Mueller. Procedural Generation of Parcels in Urban Modeling, *Computer Graphics Forum (CGF), also Eurographics*, 31(2): 15 pages, 2012.
44. 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 (TVCG)*, 12 pages, 2012.
45. A. Law, **D. Aliaga**, B. Sajadi, A. Majumder, Z. Pizlo, "Perceptually-Based Appearance Modification for Compliant Appearance Editing*", Computer Graphics Forum (CGF)*, 13 pages, 2011.
46. J. Zhang, M. Boutin, **D. Aliaga**, "Pose-Free Structure from Motion Using Depth From Motion Constraints", *IEEE Transactions on Image Processing (TIP)*, 16 pages, 2011.
47. A. Law, **D. Aliaga**, Single Viewpoint Model Completion of Symmetric Objects for Digital Inspection. *Computer Vision and Image Understanding (CVIU)*, 115(5): 603-610, 2011.
48. **D. Aliaga**, E. Bertino, S. Valtolina, DECHO - A Framework for the Digital Exploration of Cultural Heritage Objects. *ACM Journal on Computing and Cultural Heritage (JOCCH)*, 21 pages, 2011.
49. A. Law, **D. Aliaga**, A. Majumder, Projector Placement Planning for High Quality Visualizations on Real-World Colored Objects. *IEEE Transactions on Visualization and Computer Graphics (TVCG)*, also IEEE Visualization, 16(6): 10 pages, 2010.
50. O. Stava, B. Beneš, R. Mech, **D. Aliaga**, P. Kristof, Inverse Procedural Modeling by Automatic Generation of L-systems. *Computer Graphics Forum (CGF)*, also Eurographics, 29:2, 10 pages, 2010.
51. Y. Xu, **D. Aliaga**. Modeling Repetitive Motions using Structured Light. *IEEE Transactions on Visualization and Computer Graphics (TVCG)*, 16(4): 676-689, 2010.
52. C. Vanegas, **D. Aliaga**, B. Benes, P. Waddell. Interactive Design of Urban Spaces using Geometrical and Behavioral Modeling. *ACM Transactions on Graphics (TOG)*, also ACM SIGGRAPH Asia, 28(5): 10 pages, 2009.
53. **D. Aliaga**, Y. Xu. A Self-Calibrating Method for Photogeometric Acquisition of 3D Objects. *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, 32(4): 747-754, 2010.
54. **D. Aliaga**, J. Zhang, M. Boutin. A Framework for Pose-Free Modeling of 3D Scenes. *ACM Transactions on Graphics (TOG)*, 29(1): 17 pages, 2009.
55. C. Vanegas, **D. Aliaga**, P. Wonka, P. Müller, P. Waddell, B. Watson. Modeling the Appearance and Behavior of Urban Spaces. *Computer Graphics Forum (CGF)*, also Eurographics STAR, 17 pages, 2009.
56. **D. Aliaga**, M. Atallah. Genuinity Signatures: Designing Signatures for Verifying 3D Object Genuinity. *Computer Graphics Forum (CGF)*, also Eurographics, 28(2): 437-446, 2009.

57. 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 (TVCG),* 15(3): 424-435, 2009.

58. Y. Xu, **D. Aliaga**. An Adaptive Correspondence Algorithm for Modeling Scenes with Strong Inter-reflections. *IEEE Transactions on Visualization and Computer Graphics (TVCG),* 15(3): 465-480, 2009.

59. **D. Aliaga**, A. Law, Y. Yeung. Virtual Restoration Stage for Real-World Objects. *ACM Transactions on Graphics (TOG),* also ACM SIGGRAPH Asia, 27(5): 10 pages, 2008.

60. **D. Aliaga**, C. Vanegas, B. Benes. Interactive Example-based Urban Layout Synthesis. *ACM Transactions on Graphics (TOG),* also ACM SIGGRAPH Asia, 27(5): 10 pages, 2008.

61. **D. Aliaga**, B. Benes, C. Vanegas, N. Andrysco, "Interactive Reconfiguration of Urban Layouts", *IEEE Computer Graphics & Applications (CG&A),* 28(3): 38-47, 2008.

62. **D. Aliaga**, P. Rosen, D. Bekins. Style Grammars for Interactive Visualization of Architecture. *IEEE Transactions on Visualization and Computer Graphics (TVCG),* 13(4): 786-797, 2007.

63. **D. Aliaga**, Y. Xu, V. Popescu. Occlusion-Compatible Camera Design for Acquisition of Active Environments. *IEEE Computer Graphics & Applications (CG&A),* 27(5): 68-78, 2007.

64. **D. Aliaga**, Y. Xu, V. Popescu. Lag Camera: A Moving Multi-camera Array for Scene Acquisition. *Journal of Virtual Reality and Broadcasting,* Special Issue GRAPP, 3(10): 9 pages, 2007.

65. **D. Aliaga**, P. Rosen, V. Popescu, I. Carlbom. Image Warping for Compressing and Spatially Organizing a Dense Collection of Images. *Signal Processing - Image Communications:* Special Issue on Still and Dynamic Scenes, 21(9): 755-769, 2006.

66. V. Popescu, P. Rosen, **D. Aliaga**. Three-Dimensional Display Rendering Acceleration Using Occlusion Camera Reference Images. *IEEE/OSA Journal of Display Technology (JDT),* 2(3): 274-283, 2006.

67. **D. Aliaga**, I. Carlbom. Finding Yourself: Fiducial Planning for Error-Bounded Pose Estimation of a Panoramic Camera in Large Environments. *IEEE Robotics and Automation (RA):* Special Issue on Panoramic Robotics, 11(4): 53-61, 2004.

68. **D. Aliaga**, T. Funkhouser, D. Yanovsky, I. Carlbom. Sea of Images: a Dense Sampling Approach for Rendering Large Indoor Environments. *IEEE Computer Graphics & Applications (CG&A),* 23(6): 22-30, 2003.

69. **D. Aliaga**, A. Lastra. Smooth Transitions in Texture-based Simplification. *Computer & Graphics (C&G),* 22(1): 71-81, 1998.

70. M. Rafferty, **D. Aliaga**, V. Popescu, A. Lastra. Images for Accelerating Architectural Walkthroughs. *IEEE Computer Graphics & Applications (CG&A),* 18(6): 38-45, 1998.

71. **D. Aliaga**. Virtual Objects in the Real World. *Communications of the ACM (CACM),* 40(3): 49-54, 1997.

Articles in Refereed Conference Proceedings

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73. L. He, Y. Song, H. Huang, P. Liu, Y. Tang, **D. Aliaga**, X. Zhou. Kubrick: Multimodal Agent Collaborations for Synthetic Video Generation, *IEEE Computer Vision and Pattern Recognition (CVPR), Workshop: AI for Content Creation*, 10 pages, 2025.
74. Y. Song, L. He, Z. Zhang, S. Kim, H. Zhang, W. Xiong, Z. Lin, B. Price, S. Cohen, J. Zhang, **D. Aliaga**, Refine-by-Align: Reference-Guided Artifacts Refinement through Semantic Alignment, *International Conference on Learning Representations (ICLR),* 21 pages, 2025.
75. L. He, **D. Aliaga**. COHO: Context-Sensitive City-Scale Hierarchical Urban Layout Generation, In *Proceedings of European Conference on Computer Vision (ECCV),* 18 pages, 2024.
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79. A. Firoze, C. Wingren, R. Yeh, B. Benes, **D. Aliaga**, Tree Instance Segmentation with Temporal Contour Graph, In *Proceedings of IEEE Computer Vision and Pattern Recognition (CVPR),* 9 pages, 2023.
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116. C. Vanegas, **D. Aliaga,** B. Benes, Building Reconstruction using Manhattan-World Grammars, In *Proceedings of IEEE Computer Vision and Pattern Recognition (CVPR),* 8 pages, 2010.

117. Y. Xu, **D. Aliaga**, High-Resolution Modeling of Moving and Deforming Objects Using Sparse Geometric and Dense Photometric Measurements, In *Proceedings of IEEE Computer Vision and Pattern Recognition (CVPR),* 8 pages, 2010.

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119. C. Vanegas, **D. Aliaga**, B. Benes, P. Waddell. Interactive Design of Urban Spaces using Geometrical and Behavioral Modeling. In *Proceedings of ACM SIGGRAPH Asia,* also ACM Transactions on Graphics, 28:5, 10 pages, 2009 (acceptance: 23%).

120. **D. Aliaga**, M. Atallah. Genuinity Signatures: Designing Signatures for Verifying 3D Object Genuinity. In *Proceedings of Eurographics,* also Computer Graphics Forum 28:2, 437-446, March 2009 (acceptance: 23%).

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128. Y. Xu, **D. Aliaga**. Robust Pixel Classification for 3D Modeling with Structured Light. In *Proceedings of Graphics Interface (GI),* 233-240, June 2007 (acceptance: 38%).

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132. J. Zhang, M. Boutin, **D. Aliaga**. Robust Bundle Adjustment for Structure from Motion. In *IEEE International Conference on Image Processing (ICIP)*, 2185-2188, September 2006 (acceptance: 30%).

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137. **D. Aliaga**, Yi Xu, V. Popescu. Lag Camera: A Moving Multi-Camera Array for Scene Acquisition. In *Proceedings of Int'l Conference on Computer Graphics Theory and Applications (GRAPP)*, 98-107, February 2006 (acceptance: 35%).

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141. **D. Aliaga**, D. Yanovsky, T. Funkhouser, I. Carlbom. Interactive Image-Based Rendering using Feature Globalization. In *Proceedings of ACM SIGGRAPH Symposium on Interactive 3D Graphics (I3D)*, 163-170, April, 2003 (acceptance: 26%).

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143. J. Cohen, **D. Aliaga**, W. Zhang. Hybrid Simplification: Combining Multi-resolution Polygon and Point Rendering. In *Proceedings of IEEE Visualization*, 140-147, October 2001, (acceptance: 34%).

144. **D. Aliaga**, I. Carlbom. Plenoptic Stitching: A Scalable Method for Reconstructing 3D Interactive Walkthroughs. In *Proceedings of ACM SIGGRAPH*, 443-450, August 2001 (acceptance: 22%).

145. **D. Aliaga**. Accurate Catadioptric Calibration for Real-time Pose Estimation in Room-size Environments. In *Proceedings of IEEE International Conference on Computer Vision (ICCV)*, 127-134, July 2001 (acceptance: 25%).

146. **D. Aliaga**, A. Lastra. Automatic Image Placement to Provide a Guaranteed Frame Rate. In *Proceedings of ACM SIGGRAPH*, 307-316, August 1999 (acceptance: 16%).

147. **D. Aliaga**, J. Cohen, A. Wilson, E. Baker, H. Zhang, C. Erikson, K. Hoff, T. Hudson, W. Stuerzlinger, R. Bastos, M. Whitton, F. Brooks, and D. Manocha. MMR: An Interactive Massive Model Rendering System Using Geometric and Image-Based Acceleration. In *Proceedings of ACM SIGGRAPH Symposium on Interactive 3D Graphics (I3D)*, 199-206, 1999 (acceptance: 25%).

148. V. Popescu, A. Lastra, **D. Aliaga**, M. Oliveira Neto. Efficient Warping for Architectural Walkthroughs using Layered Depth Images. In *Proceedings of IEEE Visualization*, 211-215, October 1998 (acceptance: 39%).

149. M. Rafferty, **D. Aliaga**, A. Lastra. 3D Image Warping in Architectural Walkthroughs. In *Proceedings of IEEE Virtual Reality Annual International Symposium (VRAIS)*, 228-233, March 1998, (acceptance: 30%).

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153. **D. Aliaga**, M. Schneider-Hufschmidt. Prototyping of Graphing Tools Using Direct GUI Composition. In *Proceedings of Requirements Engineering*, 317-334, April 1993.

154. R. Zeleznik, D. Conner, M. Wloka, **D. Aliaga**, N. Huang, P. Hubbard, B. Knep, H. Kaufman, J. Hughes, A. van Dam. An Object-Oriented Framework for the Integration of Interactive Animation Techniques. In *Proceedings of ACM SIGGRAPH*, 105-111, July 1991 (acceptance: 21%).

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Refereed Editorials, Posters, and Briefs

156. D. Niyogi, Z. Nagy, A. Patel, A. Dallmann, N. Sudharsan, X. Ye, R. Leung, Y. Rao, R. Redmon, **D. Aliaga**, Z. Yang, F. Patadia, J. Jiao, A. Gettelman, M. Singh, M. Niyogi, C. Gal, A. Grover. Upcoming Workshop on Atmospheric and Urban Digital Twins, *104th American Meteorological Society (AMS) Meeting*, Baltimore, MD, 2024.

157. J. Ching, G. Mills, B. Bechtel, M. Demuzere, **D. Aliaga,** C. Ren, M. Wong, D. Niyogi, et al. (2022). The WUDAPT Decade, *2022 IAUC Virtual Poster Conference*, 30 August–1 September 2022.

158. J. Ching, G. Mills, **D. Aliaga**, A. Martilli, JCH. Fung, B. Bechtel, M. Demuzere, A. Middel, M. Neophytou, C. Ren, J. Feddema, V. Masson, L. See, Y. Huang, F. Chen, N. Tapper, A. Baklanov, E. Ng, Y. Yamagata, K. Lau, MF. Wong, F. Lindberg, X. Wang, W. Wang, MF. Andrade, O. Brousse, H. Simon, T. Kropp, S. Miao, D. Duarte, P. Mouzourides, J. Hidalgo, Y. Roustan, Y. Kim, L. Schwandner Ferreira, L. Zhao, N. Zhang, B. Bornstein, J. Gonzales-Cruz, D. Niyogi, The WUDAPT Approach Towards Supporting Multi-Scale Fit for Purpose Intra-Urban Atmospheric Modeling and Analyses Applications, *100th American Meteorological Society Annual Meeting*, 2020.

159. P. Patel, **D. Aliaga**, S. Karmakar, S. Ghosh, D. Niyogi, Green Roofs to mitigate the urban extreme precipitation events? An experimental study over Mumbai, India, *AGU Fall Meeting*, 2019.

160. B. Bechtel, G. Mills, J. Ching, **D. Aliaga**, and M. Demuzere, WUDAPT: current status and next steps, *EGU General Assembly: Geophysical Research Abstracts*, Vol. 21, 2019.

161. B. Dewals, A. Mustafa, M. Bruwier, J. Teller, X. Zhang, **D. Aliaga**, Automatic design of flood-resilient urban layouts, *EGU General Assembly: Geophysical Research Abstracts*, Vol. 21, 2019.

162. M. Bruwier, A. Mustafa, **D. Aliaga**, P. Archambeau, S. Erpicum, G. Nishida, X. Zhang, M. Pirotton, J. Teller, B. Dewals, Systematic flood modelling to support flood-proof urban design, *European General Sciences Union (EGU) General Assembly Conf*., 2017.

163. L. Yang, D. Niyogi, J. Smith, M. Tewari, **D. Aliaga**, F. Chen, F. Tian, G. Ni, Contribution of Urbanization and Future Climate Change to Urban Heat Island: Case Study of a Severe Heat Wave over Beijing, China, Poster at 9th *International Conference on Urban Climate*, July, 2015.

164. **D. Aliaga**, J. Zhang, M. Boutin. 3D Scene Modeling using Pose-free Reconstruction. Technical Sketch in *ACM SIGGRAPH*, August 2007.

165. Y. Xu, **D. Aliaga**. Modeling Repetitive Motions in Real-World 3D Scenes. Technical Sketch in *ACM SIGGRAPH*, August 2007.

166. **D. Aliaga**, Y. Xu, V. Popescu. Lag Camera. *Poster in ACM SIGGRAPH Symposium on Interactive 3D Graphics (I3D)*, 2006.

167. **D. Aliaga**, A. Lastra. Virtual Backdrops. *Technical Sketch in ACM SIGGRAPH*, August 1997.

Book Chapters and Edited Proceedings/Special Sections

168. Solar Energy at Urban Scale, book chapter "Geometrical Models of a City", lead author Benoit Becker, ISTE Ltd and John Wiley & Sons, Inc, 384 pages, 2012.

169. Digital Urban Modeling and Simulation, book chapter "Integrating Urban Simulation and Visualization", lead author Stefan Arisona, Springer-Verlag, 355 pages, Communications in Computer and Information Science, 2012.

170. Emerging Topics in Computer Vision and its Applications, book chapter "Novel Photogeometric Methods for Capturing Static and Deforming Objects", written together with former student Yi Xu, lead author C.H. Chen, World Scientific Publishing, 508 pages, 2011.

171. Editorial for Special Section on I3D 2010 Selected Papers, Editors: Manuel Oliveira, Daniel Aliaga, IEEE Transactions on Visualization and Computer Graphics, 41 pages, 2011.

172. Proceedings of ACM Symposium on Interactive 3D Graphics 2010, Editors: Daniel Aliaga, Manuel Oliveira, ACM Publication, 184 pages, 2010.

5. Patents

1. U.S. Patent No. 9,659,351, **D. Aliaga**, I. Garcia-Dorado, C. Montalto. "Displaying personalized imagery for improving visual acuity", May, 2017.
2. U.S. Patent No. 8,896,660, **D. Aliaga**, I. Carlbom. "Method and apparatus for computing error-bounded position and orientation of panoramic cameras in real-world environments", April 2014.
3. U.S. Patent No. 7,362,969, **D. Aliaga**, I. Carlbom. "Camera Model and Calibration Procedure for Omnidirectional Paraboloidal Catadioptric Cameras", April, 2008.
4. U.S. Patent No. 7,356,164, **D. Aliaga**, T. Funkhouser, I. Carlbom, D. Yanosvky. "Method and Apparatus for Finding Feature Correspondences Between Images Captured in Real-World Environments", April, 2008.
5. U.S. Patent No. 7,313,285, **D. Aliaga**, T. Funkhouser, I. Carlbom, D. Yanosvky. "Method and Apparatus for Compressing and Decompressing Images Captured From Viewpoints Throughout N-Dimensional Space", December, 2007.
6. U.S. Patent No. 7,126,603, **D. Aliaga**, T. Funkhouser, I. Carlbom, D. Yanosvky. "Method and System for Creating Interactive Walkthroughs of Real-World Environments From Set of Densely Captured Images", October 2006.
7. U.S. Patent No. 7,027,049, **D. Aliaga**, I. Carlbom. "Method and System for Reconstructing 3D Interactive Walkthroughs of Real-World Environments" (part 2), April 2006.
8. U.S. Patent No. 6,831,643, **D. Aliaga**, I. Carlbom. "Method and System for Reconstructing 3D Interactive Walkthroughs of Real-World Environments" (part 1), April 2004.

6. Business Ventures

1. UrbanSim: technical advisor (2018-present), a startup for using data science, simulation and visualization to learn from the past, inform the present, and shape the future of communities.
2. Authentise: technical advisor (2013-present), a startup to develop novel secure 3D printing methodologies; first products released.
3. Synthicity: technical advisor (2012-2015), a startup to develop novel urban design and planning software, acquired by AutoDesk in 2015.
4. CPrecisely Inc.: co-founder (2014-2017), startup venture to deploy novel image processing technique that corrects images so that they appear in focus to an observer not wearing their prescription eyeglasses.

7. Grants and Gifts

Total awarded: 29 grants/gifts (20 as PI, 2 as Purdue-PI, and 7 as Co-PI)

Total awarded for all projects with Aliaga as PI or co-PI: $42,497,000

Total awarded for all projects with directed by Aliaga as PI or his portion as co-PI: $14,757,500

1. NSF, "Frameworks: Cyberinfrastructure for Urban Tree Resilience and Environmental Equity (uTREE)"
   Duration of Funding: 9/01/2024 – 8/30/2029
   Total Amount of Award: $5,000,000
   Your Role: PI
2. USDA, "EFFICACI: Engaging Family Forests to Improve Climate-Smart Commodities"
   Duration of Funding: 12/01/2023 – 5/31/2027
   Total Amount of Award: $8,900,000 (my portion: $1.4M)
   Your Role: Co-PI
3. USDA, "Promoting Economic Resilience and Sustainability of the Eastern US Forests (PERSEUS)"
   Duration of Funding: 04/01/2023 – 03/31/2028
   Total Amount of Award: $10,000,000 (my portion: $1.5M)
   Your Role: Co-PI
4. NSF IIS, "Deep Generative Modeling for Urban and Archaeological Recovery"
   Duration of Funding: 09/01/2021 – 08/31/2024
   Total Amount of Award: $1,000,0000 ($800k for Purdue; my portion: $500k)
   Your Role: PI
5. NSF OAC, "U-Cube: A Cyberinfrastructure for Unified and Ubiquitous Urban Canopy Parameterization"
   Duration of Funding: 01/01/2019 – 9/31/2024
   Total Amount of Award: $600,000 (my portion: $355k)
   Your Role: PI
6. Adobe Inc., "Deep Image Processing"
   Duration of Funding: 08/01/2022 – present
   Total Amount of Award: $15,000 (my portion: $15k)
   Your Role: PI
7. UNSA, "Review of Academic Programs at Universidad Nacional San Agustin"
   Duration of Funding: 09/01/2020 – 12/31/2023
   Total Amount of Award: $70,000 (my portion: $40k)
   Your Role: PI
8. EagleSight, "Multi-view Preemptive Image-based Vision Correction"
   Duration of Funding: 1/1/2022 – 5/1/2023
   Total Amount of Award: $150,000 (my portion: $150k)

Your Role: PI

9. NSF EAGER, “Minimal 3D Modeling Methodology”
   Duration of Funding: 07/01/2020 – 06/30/2022
   Total Amount of Award: $65,000 (my portion: $65k)
   Your Role: PI
10. NSF IIS, “Functional Proceduralization of 3D Geometric Models” (status: funded)
   Duration of Funding: 08/15/2018 - 07/31/2022
   Total Amount of Award: $500,000 (my portion: $250k)
   Your Role: PI
11. Internet 2 ECAS Phase I, “Building Clouds: Worldwide Building Typology Modeling from Images”
   Duration of Funding: 5/01/2019 – 4/30/2020
   Total Amount of Award: $180,000 ($100k computing, $80k personnel; my portion: $180k)
   Your Role: PI
12. IARPA, ”LEGO: Large-scale Environment-modeling with Geometric Optimization”
   Duration of Funding: 09/15/2017 - 09/14/2021
   Total Amount of Award: $10,000,000 (my portion: $621,628)
   Your Role: Co-PI;
13. NSF I/UCRC, “Phase I: Robots and Sensors for the Human Well-being” (status: funded)
   Duration of Funding: 09/9/2014 - 08/31/2020
   Total Amount of Award: $637,202 (my portion: $25k)
   Your Role: Co-PI
14. NSF IIS, “Collaborative Research: A Heterogeneous Inference Framework for 3D Modeling and Rendering of Sites”
   Duration of Funding: 08/01/2013 - 07/30/2017
   Total Amount of Award: $1,200,000 (my portion: $300k)
   Your Role: Purdue PI (collaborative with Yale; Purdue portion is $600k)
15. NSF CBET, “STRONG Cities – Simulation Technologies for the Realization of Next Generation Cities”
   Duration of Funding: 09/15/2012 - 08/31/2017
   Total Amount of Award: $552,408 (my portion: $300k)
   Your Role: PI
16. NSF IIS, “Integrating Behavioral, Geometrical and Graphical Modeling to Simulate and Visualize Urban Areas”
   Duration of Funding: 09/01/2010 - 08/31/2014
   Total Amount of Award: $900,000 (my portion: $300k)
   Your Role: PI (with Berkeley; Purdue portion is $450k)

17. NSF CNS, “A Computational Framework for Marking Physical Objects against Counterfeiting and Tampering” (status: ended)
    Duration of Funding: 09/01/2009 - 08/31/2013
    Total Amount of Award: $499,883 (my portion: $300k)
    Your Role: PI

18. MTC, “Urban Simulation and Visualization”
    Duration of Funding: 01/01/2011 – 08/01/2013
    Total Amount of Award: $600,000 (my portion: $150k)
    Your Role: Purdue PI (with Berkeley; Purdue portion is $285k)
19. NSF INTEROP, “A Community-based Drought Information Network for Multidisciplinary Applications” (status: ended)
    Duration of Funding: 09/01/2008 - 08/31/2013
    Total Amount of Award: $750,000 (my portion: $50k)
    Your Role: Co-PI
20. Google Research Award, “Automatic Modeling of Buildings”
    Duration of Funding: 02/01/2011 – present
    Total Amount of Award: $70,000 (my portion: $70k)
    Your Role: PI
21. NVIDIA Hardware Gift, “Tablet-based Tools for Urban Visualization & Simulation” (equipment)
    Duration of Funding: 04/01/2012 – present
    Total Amount of Award: $2,000 (given as equipment; my portion: $2k)
    Your Role: PI
22. NSF CCF, “3D Scene Digitization - A Novel Invariant Approach for Large-Scale Environment Capture” (status: ended)
    Duration of Funding: 08/15/2004 - 07/31/2008
    Total Amount of Award: $500,000 (my portion: $300k)
    Your Role: PI
23. Adobe Inc., “Vector Pattern Modeling and Editing (Continuance)” (unrestricted gift)
    Duration of Funding: 08/15/2009 – present
    Total Amount of Award: $10,000 (my portion: $5k)
    Your Role: Co-PI
24. Adobe Inc., “Vector Pattern Modeling and Editing” (unrestricted gift)
    Duration of Funding: 08/01/2008 – present
    Total Amount of Award: $45,000 (my portion: $22.5k)
    Your Role: Co-PI
25. PACE/Hewlett-Packard Hardware Grant, “Genuinity Signatures” (equipment)

Duration of Funding: 04/01/2008 – present
Total Amount of Award: $5,000 (my portion: $5k)
Your Role: PI

26. Purdue-IUPUI Research Grant, "Digital Inspection and Virtual Restoration of 3D Objects"
    Duration of Funding: 02/01/2008 – 05/01/2009
    Total Amount of Award: $50,000 (with IUPUI; my portion: $35k)
    Your Role: PI
27. NSF REU, "3D Scene Digitization - A Novel Invariant Approach for Large-Scale Environment Capture"
    Duration of Funding: 08/15/2006 – 07/31/2008
    Total Amount of Award: $6,000 (my portion: $6k)
    Your Role: PI
28. Microsoft Research, "Tablet PC-Based Teaching Platform for Portable Mixed-Reality Concept"
    Duration of Funding: 01/01/2005 – present
    Total Amount of Award: $50,000 (my portion: $50k))
    Your Role: PI
29. Microsoft Research, "Immersive Mentoring Using Mixed-Reality Tabletop"
    Duration of Funding: 01/01/2004 – present
    Total Amount of Award: $40,000 (my portion: $20k))
    Your Role: PI

Competitive Internal Funding Received (Direct cost equivalent of ~$490,000):

1. SPARK, "Urban Computes: Towards an Emerging Integrative Urban Computing Expedition", Daniel Aliaga (PI), Brady Hardiman, Melba Crawford, $100k, 2024-2025.
2. Bilsland Fellowship, "Inverse Urban Modeling", 1 year support, during 2021/2022.
3. Summer Research Grant, 2 months support, 2021.
4. Purdue Research Foundation, "Sketching Static and Dynamic 3D Models", 1 year graduate student support, August 2017-May 2018.
5. Bilsland Fellowship, "Inverse Procedural Modeling", 6 months graduate student support, during Fall 2016.
6. Bilsland Fellowship, "Inverse Traffic Modeling", 6 months graduate student support, during Spring 2015.
7. Discovery Park Faculty Fellow Research Funds, $35k, 2013-2014.
8. Purdue Research Foundation, "Semantic-Aware Inverse 3D Modeling of Buildings and Cities", 1 year graduate student support, August 2012-May 2013.
9. Purdue Special Incentive Research Grant, Computing Research Institute, "Modeling the Appearance and Behavior of Peta-scale Urban Spaces", 1 year graduate student support, August 2009-July 2010.

10. Purdue Summer Research Grant, “Genuinity Signatures”, 1 summer graduate student support, June-August 2009.
11. Bilsland Fellowship, “Efficient and Robust Image-based Modeling of Dynamic Scenes”, 6 months graduate student support, June 2009-March 2010.
12. Purdue Research Foundation, “Designing Tomorrow’s Cities: Simulation and Creation of Urban Environments”, 1 year graduate student support, August 2008-May 2009.
13. Purdue Research Foundation, “Acquiring Active Environments”, 1 year graduate student support, August 2006-May 2007.

8. Professional Engagement

External

Journal Editor

- Editorial Board, IEEE Transactions on Visualization and Computer Graphics, 2020-present
- Editorial Board, Visual Computer Journal, 2020-present
- Editorial Board, Computer Graphics Forum, 2013-2016
- Editorial Board, Elsevier Graphical Models, 2006-2020

Program Committees

1. ACM SIGGRAPH Asia, 2025
2. IEEE Computer Vision and Pattern Recognition, 2025
3. IEEE CVPR, 2nd Workshop on Urban Scene Modeling, 2025
4. AAAI Conference on Artificial Intelligence, 2025
5. ACM SIGGRAPH Asia, 2024
6. IEEE CVPR, 1st Workshop on Urban Scene Modeling, 2024
7. Deep Learning for Geometric Computing Workshop (at IEEE CVPR), 2024
8. IEEE Computer Vision and Pattern Recognition, 2024
9. AAAI Conference on Artificial Intelligence, 2024
10. IEEE International Conference on Computer Vision, 2023
11. AAAI Conference on Artificial Intelligence, 2023
12. IEEE Computer Vision and Pattern Recognition, 2023
13. Deep Learning for Geometric Computing Workshop (at IEEE CVPR), 2023
14. Neural Information and Processing Systems, 2022
15. IEEE International Conference on Computer Vision, 2022
16. Deep Learning for Geometric Computing Workshop (at IEEE CVPR), 2022
17. AAAI Conference on Artificial Intelligence, 2022
18. IEEE International Conference on Computer Vision, 2021
19. Deep Learning for Geometric Computing Workshop (at IEEE ICCV, 2021)
20. IEEE Computer Vision and Pattern Recognition, 2021
21. AAAI Conference on Artificial Intelligence, 2021
22. Eurographics, 2021
23. SIBGRAPI Conference on Graphics, Patterns, and Images, 2020
24. European Conference on Computer Vision, 2020
25. AAAI Conference on Artificial Intelligence, 2020

26. Deep Learning for Geometric Computing Workshop (at IEEE CVPR), 2020
27. IEEE Computer Vision and Pattern Recognition, 2020
28. Eurographics, 2020
29. ACM SIGGRAPH Asia Courses, 2019
30. IEEE International Conference on Computer Vision, 2019
31. IEEE International Symposium on Mixed and Augmented Reality, 2019
32. IEEE Computer Vision and Pattern Recognition, 2019
33. IEEE Computer Vision and Pattern Recognition, 2018
34. ACM SIGGRAPH Asia, 2017
35. Eurographics, 2017
36. IEEE Computer Vision and Pattern Recognition, 2017
37. ACM SIGGRAPH Asia, 2016
38. ACM SIGGRAPH Asia Technical Briefs and Posters, 2016
39. European Conference on Computer Vision, 2016
40. First International Conference on Urban Physics, 2016
41. Eurographics, 2016
42. International Workshop on Smart Cities and Urban Analytics, 2015
43. ACM SIGGRAPH, 2015
44. 3DV (3D Imaging, Modeling, Processing, Visualization & Transmission), 2015
45. CEIG (Congreso Espanol de Informatica Grafica), 2015
46. ACM SIGGRAPH Asia Technical Briefs and Posters, 2014
47. Eurographics, 2014
48. IEEE Visualization, 2014
49. 3DV (3D Imaging, Modeling, Processing, Visualization & Transmission), 2014
50. Latin American Symposium on Computer Graphics, Virtual Reality and Image Processing, 2014
51. IEEE Visualization, 2013
52. IEEE International Conference on Computer Vision, 2013
53. 3DV (3D Imaging, Modeling, Processing, Visualization & Transmission), 2013
54. ACM SIGGRAPH Asia Technical Briefs and Posters, 2013
55. ICVGIP, 2012
56. 3DPVT, 2012
57. European Conference on Computer Vision, 2012
58. ACM/IEEE International Workshop on Projector-Camera Systems, 2012
59. IEEE Computer Vision and Pattern Recognition, 2012
60. Int'l Conference on Computing for Geospatial Research & Applications, 2012
61. ACM SIGGRAPH Symposium on Interactive 3D Graphics, 2012
62. IEEE Visualization, 2011
63. IEEE International Conference on Computer Vision, 2011
64. IEEE Computer Vision and Pattern Recognition, 2011
65. Int'l Conference on Computing for Geospatial Research & Applications, 2011
66. ACM SIGGRAPH Symposium on Interactive 3D Graphics, 2011
67. ACM/IEEE International Workshop on Projector-Camera Systems, 2010
68. SIBGRAPI Conference on Graphics, Patterns, and Images, 2010
69. ECCV Workshop on Reconstruction and Modeling of Large-Scale 3D Virtual Environments, 2010

70. Int'l Conference on Computing for Geospatial Research & Applications, 2010
71. ACM International Symposium on Mixed and Augmented Reality, 2010
72. 3D Digital Imaging and Modeling, 2009
73. ACM/IEEE International Workshop on Projector-Camera Systems, 2009
74. SIBGRAPI Conference on Graphics, Patterns, and Images, 2009
75. Pacific Graphics, 2008
76. ACM SIGGRAPH Symposium on Interactive 3D Graphics, 2008
77. SIBGRAPI Conference on Graphics, Patterns, and Images, 2008
78. ACM HyperText, 2008
79. IEEE International Conference on Computer Vision, Workshop on Visual Representations and Modeling of Large-scale Environments, 2007
80. ACM Int'l Symposium on Mixed and Augmented Reality, 2007
81. Pacific Graphics, 2007
82. Symposium on Point-based Graphics, 2007
83. SIBGRAPI Conference on Graphics, Patterns, and Images, 2007
84. ACM SIGGRAPH Symposium on Interactive 3D Graphics, 2007
85. EG/CPCG Int'l Conference on Computer Graphics Theory and Applications, 2007
86. Symposium on Point-based Graphics, 2006
87. ACM International Symposium on Mixed and Augmented Reality, 2006
88. ACM Symposium on Virtual Reality Software and Technology, 2006
89. Pacific Graphics, 2006
90. ACM SIGGRAPH Symposium on Interactive 3D Graphics, 2006
91. EG/CPCG Int'l Conference on Computer Graphics Theory and Applications, 2006
92. SIBGRAPI Conference on Graphics, Patterns, and Images, 2006
93. Symposium on Point-based Graphics, 2005
94. ACM International Symposium on Mixed and Augmented Reality, 2005
95. ACM SIGGRAPH Symposium on Interactive 3D Graphics, 2005
96. Symposium on Point-based Graphics, 2004

Conference Organization and Participation

- Papers Co-Chair, SkelNetOn Workshop at CVPR, 2019.
- Co-Organizer, DeepGlobe Workshop at CVPR, 2018.
- Papers Co-Chair, SIBGRAPI, 2016
- Papers Co-Chair, ACM SIGGRAPH Symposium on Interactive 3D Graphics 2010
- General Co-Chair, ACM SIGGRAPH Symposium on Interactive 3D Graphics 2009
- Student Stipend Chair, ACM SIGGRAPH Symposium on Interactive 3D Graphics 2008

Grant Funding Panels

- NSF CISE, NRI, IGERT Panels: 2001 - present
- Peru CONCYTEC (Peruvian NSF equivalent): 2014
- QNRF (Qatar National Research Fund); 2011, 2013

Reviewer (above and beyond the program committees/journal editorial boards served on)

- ACM SIGGRAPH/ACM Transaction on Graphics, ACM SIGGRAPH courses, ACM Computational Geometry

- IEEE Transactions on Visualization and Computer Graphics, IEEE Transactions on Pattern Analysis and Machine Intelligence, IEEE Computer Graphics and Applications, IEEE Visualization, IEEE Transactions on Image Processing, IEEE Transactions on Circuits and Systems for Video Technology, IEEE Transactions on Multimedia Systems
- Elsevier Image Communication, Computer & Graphics
- Eurographics, Eurographics Rendering Workshop
- International Symposium on 3D Data Processing, Visualization and Transmission

Department and University

- College of Science *Faculty Diversity Committee* 2010-2015, 2018-; *Committee Chair* Fall 2012-May 2014
- Department *Diversity Chair*, Fall 2010, Spring 2012-present.
- Member of the *Graduate Committee*, August 2008-2010, Purdue University.
- Member of the *Graduate Admissions Committee*, August 2005-May 2008, Purdue University.
- Member of *Undergraduate Committee*, August 2005-May 2007, Purdue University.
- Founder of AMIGOS (Association of Minorities in Graphics and Other Sciences): Aliaga is a Hispanic minority who formed this association using initial funds sponsored by IBM Research and to recruit Hispanics, Latinos, and other minorities interested in computer graphics, computer science, and other sciences. During its first year of inception (academic year 2008-2009), exposed computer graphics and summer employment opportunities to undergraduates (in coalition with USB – Undergraduate Student Board), to Latino Scholars (in cooperation with LaFASA – Latino Faculty and Staff Association at Purdue), to high-school students (as part of SACNAS, Society for the Advancement of Chicanos and Native Americans in Science).
- Representative to Purdue Undergraduate Research Day, November 2005.
- Co-planned the "Live Virtual Tour into the Future" computer graphics demonstration during the inauguration of the Lawson Computer Science Building, October 2003, Purdue University.
- College of Science *Grievance Committee*, August 2005-May 2008.
- Faculty Advisor for Purdue Karate Club, August 2020-present.
- Faculty Advisor for Ecuadorians at Purdue University, 2016-present.
- Faculty Advisor for Purdue Tango Milonguera Club, August 2005-2014.
- Guest Lecturer for numerous freshman and honor's level undergraduate courses (2003-present)

9. Fellowships and Awards

- Purdue Seed for Success Acorn Award (2024)
- Purdue Seed for Success Acorn Award (2023)
- Purdue University Team Award (2020)
- Fulbright Scholar Award, 2018-2019
    - Awarded $65k in funds for attending University of Tokyo during sabbatical; however, funds returned because performed sabbatical elsewhere.
- Discovery Park Faculty Fellow (July 2013-June 2014):
    - Received $35k in internal funds
- Purdue University Diversity Award (2012)
- OECD Fellowship Recipient (2011):

Received 10,000 euros (approximately $15,000) from Organisation for Economic Co-operation and Development for “Designing and Visualizing Sustainable Interactions between Agriculture and Urban Areas”.

- Invited Member of Upsilon Pi Epsilon, International Honor Society for the Computer and Information Disciplines (2010)
- Purdue University Undergraduate Advising Award (2009)
- Purdue University Engagement Award (2008)

10. Invited Talks/Colloquiums (not including conference nor Purdue talks)

1. “AI for Urban Visual Computing”, Keynote, *CVPR,* Urban Scene Modeling, June 2025.
2. “AI and Visual Computing for Localizing Trees in Cities Nationwide”, Invited Talk, *University of Georgia,* May 2025.
3. “US-Scale Urban Green and Gray Modeling”, Invited Talk, *Cornell University,* April, 2024.
4. “Urban Gray and Green Infrastructure What-If Scenarios”, *UNSA Annual International Computing Week,* Invited Talk, Arequipa, Peru, 2023.
5. “Urban Computing: An Emerging Integrative Computing Platform”, Invited Talk, *NSF-Sponsored Workshop on Atmospheric and Urban Digital Twins (AUDT),* 2023.
6. “Deep Synthetic City Generation for Providing Realistic What-if Scenario Environmental Analysis”, Invited Talk, *National Center for Atmospheric Research (NCAR),* January, 2023.
7. “Deep Visual Computing for Urban Modeling and Design”, Invited Talk, *Texas A&M University*, October, 2022.
8. “Deep Visual Computing for Urban Modeling and Design”, Invited Talk, *University of Texas at Austin,* October, 2022.
9. “Deep Visual Computing for Urban Modeling and Design”, Invited Talk, *Cornell University*, September, 2022.
10. “Deep Computational Archaeology”, Invited Talk, *University of West Attica/CONSER*, Athens, Greece, June, 2022.
11. “Urban Computational Archaeology”, Invited Talk, *Universidad National de San Agustin,* Arequipa, Peru, March, 2022.
12. “Holistic Urban Modeling”, Invited Talk, *ECCV Workshop on Holistic 3D Modeling*, August, 2020.
13. “Urban Scene Generation”, Invited Talk, *CVPR Workshop on Learning 3D Generative Models*, June, 2020.
14. “3D City Generation for Machine Learning and Urban Design”, Invited Talk, *CVPR Workshop on 3D Scene Generation,* June, 2019.
15. “STRONG Cities: Simulation Technologies for the Realization of Next Generation Cities”, Colloquium, *King Abdullah University of Science and Technology (KAUST),* Saudi Arabia, 2018.
16. “Interactively Designing Future Buildings and Cities”, Keynote, *International Workshop on Visual Computing*, Bogota, Colombia, 2018.
17. “Cities of Tomorrow: Visual Computing for Designing and Modeling Urban Ecosystems”, Keynote, *Peruvian Symposium On Computer Graphics and Imaging*, Arequipa, Peru, 2017.
18. “Cities of Tomorrow: Visual Computing for Designing and Modeling Urban Ecosystems”, Invited Speaker, *Universidad de Tecnologia y Ciencias*, Lima, Peru, 2017

19. "Designing and Modeling Cities of Tomorrow", Invited Speaker, *Bogota ACM SIGGRAPH*, Bogota, Colombia, 2016.
20. "Designing and Modeling Cities of Tomorrow", Invited Speaker, *SIBGRAPI*, Brasil, Sao Jose, 2016.
21. "Visual Computing for Designing and Modeling Urban Ecosystems", Invited Talk, *INRIA – Sophia-Antipolis*, France, July 2015.
22. "What You See Is Not (Necessarily) What You Have", Invited Talk, *INRIA – Sophia-Antipolis*, France, July 2015.
23. "Designing and Modeling Intelligent Cities", Invited Talk, *Universidad de Ingenieria y Tecnologia*, Lima, Peru, July, 2013.
24. "Cities of Tomorrow: Visual Computing for Sustainable Urban Ecosystems", Invited Talk, *National Institute of Informatics*, Tokyo, Japan, July 2013.
25. "Cities of Tomorrow: Visual Computing for Sustainable Urban Ecosystems", Invited Talk, *Networks and Complex Systems at IU Bloomington, Cyberinfrastructure for Network Science Center*, April, 2013.
26. "Appearance Editing: What you see is not what you have", Invited Talk, *3rd Annual SIGGRAPH Chapter Conference*, Bogota, Colombia, October, 2012.
27. "Appearance Editing", Invited Talk, *UMIACS, Univ. of Maryland at College Park*, July 2012.
28. "Cities of Tomorrow: Visual Computing for Designing Sustainable Urban Ecosystems", Keynote, *National Socio-Environmental Synthesis Center (SESYNC) Workshop: Visualization Technologies to Support Research on Human-Environmental Interactions*, July, 2012.
29. "Appearance Editing", Invited Talk, *ETH Computer Science/Disney Research Lab*, Zurich, Switzerland, November, 2011.
30. "Future City Systems", Invited Talk (and Panel Member), *Asia-Pacific Conference on Systems Engineering (APCOSE): Green Growth and Systems Engineering*, Korea, October, 2011.
31. "Computational Cities: Geometrical Modeling for Urban Design and Simulation", Invited Talk, *Center for Image Analysis, Uppsala University*, Sweden, September, 2011.
32. "Computational Cities: Geometrical Modeling for Urban Design and Simulation", Invited Talk, *Department of Urban Systems Engineering, Technical University of Compiegne*, Compiegne, France, June, 2011.
33. "Computational Cities: Geometrical Modeling for Urban Design and Simulation", Invited Talk, *Qatar Energy and Environment Institute and Qatar Computing Research Institute*, Qatar Foundation, Doha, Qatar, April, 2011.
34. "Computational Cities: Geometrical Modeling for Urban Design and Simulation", Colloquium Talk, *Department of Informatics, University of Zurich*, Zurich, Switzerland, March, 2011.
35. "3D Urban Modeling and Simulation", Invited Talk, *Chair of Information Architecture, ETH*, Zurich, Switzerland, April, 2011.
36. "Designing Smarter Cities by Integrating Urban Behavioral and Geometrical Simulation", Featured Note, *1st International Conference on Computing for Geospatial Research and Applications*, Washington, DC, June, 2010.
37. "Designing and Modeling Intelligent Cities", Invited Talk, *Department of Architecture, Universidad Central del Ecuador*, Quito, Ecuador, June, 2010.
38. "Designing and Modeling Intelligent Cities", Invited Talk, *Department of Engineering, Universidad Politécnica*, Quito, Ecuador, May, 2010.

39. "Designing and Modeling Intelligent Cities", Invited Talk, *Department of Engineering and Informatics, Universidad Católica,* Quito, Ecuador, May, 2010.
40. "Designing and Modeling Intelligent Cities", Invited Talk, *Department of Informatics, Universidad Católica*, Lima, Peru, May, 2010.
41. "Towards Designing and Modeling Smarter Cities", *Invited Talk, NAVTEQ*, Chicago, IL, April, 2010.
42. "Restoring the Past: A Virtual Restoration Stage for Real-world Objects", Invited Talk, *Department of Computer Science, University of Washington*, Seattle, WA, June, 2009.
43. "Modeling the Appearance and Behavior of Urban Spaces", Invited Talk, *Department of Urban Planning and Public Affairs, University of Washington,* Seattle, WA, June, 2009.
44. "Genuinity Signatures: Designing Signatures for Verifying 3D Object Genuinity", Invited Talk, *Department of Computer Science, ETH*, Zurich, Switzerland, March, 2009.
45. "Changing the Past: Virtual Restoration of Real-World Objects", Invited Talk, *Computer Science and Artificial Intelligence Laboratory*, Massachusetts Institute of Technology, Boston, MA, March 2009.
46. "Changing the Past: Virtual Restoration of Real-World Objects", Invited Talk, *School of Engineering and Applied Sciences*, Harvard University, Boston, MA, March, 2009.
47. "AMUSE: Acquiring and Modeling Urban Simulation Environments", *Notre Dame University, Northwest Indiana Computational Grid Meeting*, August, 2005.
48. "Research Problems and Solutions for Content Generation in 3D Gaming", Invited Talk, *Midway Games*, Chicago, IL, March, 2005.
49. "Plenoptic Stitching", Department of Computer Science, Invited Talk, *University of North Carolina, Chapel Hill*, NC, May, 2001.
50. "Images for Rendering Acceleration", Invited Talk, *Department of Computer Science, Johns Hopkins University*, Baltimore, MD, March, 2000.
51. "Image-based Rendering for Interactive Walkthroughs", Invited Talk, *Department of Computer Science, Princeton University,* Princeton, NJ, March, 2000.
52. "Image-based Rendering for Acceleration", Invited Talk, *Department of Computer Science, University of Virginia*, Charlottesville, VA, November, 1999.

Conference Course Presentations (peer reviewed)

53. "Modeling and Remodeling 3D Worlds", *ACM SIGGRAPH Course,* Co-organizer and presenter, November, 2017.
54. "Inverse Procedural Modeling of 3D Models for Virtual Worlds", Co-organizer and presenter, *ACM SIGGRAPH Course*, July, 2016.
55. "Modeling 3D Urban Spaces Using Procedural and Simulation-Based Techniques", Co-organizer and presenter, *ACM SIGGRAPH Course*, August, 2011 (peer reviewed).
56. "Modeling the Appearance and Behavior of Urban Spaces", Co-organizer and presenter, *Eurographics State of the Art Report*, Munich, Germany, March, 2009 (peer reviewed).
57. "Interactive Walkthroughs of Large Geometric Datasets", Co-organizer and presenter, *ACM SIGGRAPH Course*, July, 2000 (peer reviewed).
58. "Interactive Walkthroughs of Large Geometric Datasets", Co-organizer and presenter, *ACM SIGGRAPH Course*, August, 1999 (peer reviewed).

Other presentations

59. "Deep Synthetic City Generation for Providing Realistic What-if Scenario Environmental Analysis ", presenter, *American Meteorological Society (AMS), Special Session on World Urban Database and Access Portal Tools*, January, 2023.
60. "Future Novel Applications of PROCAM Systems", Invited Panel Member, *IEEE International Workshop on Projector-Camera Systems*, June, 2009.
61. "3D Scene Modeling using Pose-free Reconstruction", presenter, *ACM SIGGRAPH Sketch*, August, 2007 (peer reviewed).
62. "Modeling Repetitive Motions in Real-World 3D Scenes", presenter, *ACM SIGGRAPH Sketch*, August, 2007 (peer reviewed).
63. "Virtual Backdrops", presenter, *ACM SIGGRAPH Sketch*, August, 1997 (peer reviewed).

11. Students

Graduate Students

Current Advisee's

- David Song, Ph.D. student in Computer Science (estimated graduation in 2025).
- Adnan Firoze, Ph.D. student in Computer Science (estimated graduation in 2026).
- Aocheng Li, Ph.D. student in Computer Science (estimated graduation in 2027).
- Tanner Waltz, Ph.D. student in Computer Science (estimated graduation in 2028).

Visiting Students and Scholars

- Camila Rodriguez, undergraduate, Data Science, Universidad de Ingeniería y Tecnología, Lima, Peru, Fall 2024.
- Carlos Torres, Ph.D. student in Computer Science, Universidad Nacional San Augustin, Arequipa, Peru, Fall-Spring 2023-2024.
- Julio Vera, Ph.D. student in Computer Science, Universidad Nacional San Augustin, Arequipa, Peru, Fall-Spring 2023-2024.
- Prof. Jacques Teller, Department of Urban Planning, University of Liege, Belgium, AY 2020-2021.
- Pratiman Patel, Ph.D. student in Climate Studies, Overseas Visiting Doctoral Fellow, IIT Bombay, India, 2019.
- Ahmed Mustafa, Ph.D. student in Urban Planning, University of Liege, Belgium, 2017.

Former Advisee's

- Liu He (C.S. Ph.D. 2024), "Generative Large-scale Urban Layout Analysis and Synthesis ", started at *Amazon Research*.
- Christopher May (C.S. Ph.D., 2024), "Deep Synthesis of Distortion-Free 3D Omnidirectional Imagery from 2D Images", started at *Department of Computer Science at Purdue University* as an Assistant Professor of Practice.

- Zixun Yu (C.S. Ph.D., 2023), “Reducing Image Artifacts in Motion Blur Prevention“, started at *Google*.
- Xiaowei Zhang (C.S. Ph.D., 2022), “Using Structural Regularities for a Procedural Reconstruction of Urban Environments from Satellite Imagery”, started *Uber*.
- Tharindu Mathew (C.S. Ph.D., 2021), “Controlling and Enabling Improved Crowd Simulation”, started *Microsoft*.
- Gen Nishida (C.S. Ph.D., 2018), “Interactive Sketching Framework for Static and Dynamic 3D Content Creation”, started *GM Cruise*.
- Ilke Demir (C.S. Ph.D. 2017), “A Generalized Proceduralization Framework for Urban Models with Applications in Procedural Modeling, Synthesis, and Reconstruction“, started at *Facebook*.
- Ignacio Garcia-Dorado (C.S. Ph.D. 2015), “SMART CITIES: Inverse Design of 3D Urban Models with Traffic and Weather Simulation “, started at *Google Research*.
- Carlos Vanegas (C.S. Ph.D. 2012) “Modeling the Appearance and Behavior of Urban Spaces“, started at *UC Berkeley* as a Post-doc, then at a startup: *Synthicity*.
- Yi-Liu Chao, ABD, on leave since 8/2012, Ph.D. Candidate in Computer Science. Dissertation topic: Ensuring the Genuinity of Physical Objects (qual I/II passed), start at *BrightEdge.*
- Alvin Law, (C.S. Ph.D., 2011), “Compensation Compliant Appearance Editing of Physical Objects with Arbitrary Shape and Color”, started at *Google*.
- Yi Xu, (C.S., Ph.D., 2010): “Capturing Real-World Dynamic Objects Using Temporally-Coded Photography”, started at *GE Research*.
- Abhinav Jain (C.S., M.S., 2006): “Robotic Image Acquisition”, started at *Rockwell Collins.*
- Daniel Bekins (C.S., M.S., 2005): M.S. Thesis “Build-by-Numbers”, started at *Electronic Arts.*
- Scott Yost (C.S., M.S., 2004): “Mixed-Reality Tabletop”, started at *Microsoft Corporation*.

Current and Former Ph.D. Committee Membership

- Yunmei Huang (Forestry, Ph.D., 2025 estimated): remote-sensing based tree species identification and inventory estimation
- Yichen Sheng (C.S., Ph.D. 2024 estimated): deep-learning based methods to produce 3D effects without depth information.
- Matheiu Gaillard (C.S., Ph.D. 2023): procedural and biological modeling and reconstruction of plants.
- Alejandro Guayaquil (C.G.T., Ph.D. 2018): completed Ph.D. Thesis “Automatic exploding 3D views of objects for technical illustrations”.
- Paul Schmid (E.A.S, Ph.D. 2020): completed Ph.D. Thesis “Impacts of land-surface heterogeneity and urban aerosols on thunderstorms”.
- Jae Sung Kim (C.E. Ph.D. 2014): completed PhD. Thesis “Automated Triangulation of Video Imagery by Successive Relative Orientation”, Purdue University.
- Jaeyoung Park (E.C.E. Ph.D., 2013): completed Ph.D. Thesis “Effect of Contact Location Information on Haptic Shape Perception”, Purdue University.
- Paul Rosen (C.S., Ph.D., 2010): completed Ph.D. Thesis “Improved 3-D Scene Sampling By Camera Model Design”, Purdue Univ., started as *Research Assistant Professor at Univ. of Utah.*
- Mihai Mudure (C.S., Ph.D., 2008): completed Ph.D. Thesis “Efficient and Versatile 3D Scene Modeling by Sparse-Depth Dense-Viewpoint Acquisition”, Purdue Univ., started at *Google Inc*.

- Huiying Xu (C.S., Ph.D., 2007): completed Ph.D. Thesis "Physically-based model of surface and subsurface scattering", Purdue University, started at *CISCO Systems Inc*.
- David Gotz (C.S., Ph.D., 2005): completed Ph.D. Thesis "Scalable and Adaptive Streaming for Non-linear Media", University of North Carolina at Chapel Hill, started at *IBM T.J. Watson Research Center*.

Undergraduate and High School Students

- Mridu Prashanth (CS 2025), "Urban Fires and Urban Weather Regional Forecasting", Summer 2024-Spring 2025
- Nicholas Myrick (CS 2025), "Urban Fires", Summer 2024
- Jairo Marulanda (CS), "Urban Roof Estimation", Visiting Scholar, EAFIT, Columbia, Fall 2023
- Safi Z. A. Qadir (C.S. 2023), "Blur-Resistant Font", Fall 2022.
- Jerry Hsu (C.S. 2020), "Street View Building Image Segmentation", Spring 2019.
- Jacob Dunbar, (C.S. 2018), "Crowd-Controlled User Interface", Fall 2017.
- Hareesh Gali, (C.S., 2020), "WUDAPT Portal Development", Fall 2016, Spring 2017.
- Aahash Ranga (C.S. 2018), "WUDAPT Portal Development", Fall 2016.
- Zheng Qing Li (C.S., 2016), "Interactive Water Simulation using GPUs", CS490 Spring 2015.
- Stephen Pinceti (C.S., 2015), "Interactive Volumetric Deformation", CS490 Spring 2015
- Ben Staiger (Jefferson High School senior in 2012-13, now Purdue freshman, still working in research group), "Appearance Editing", Summer 2013/Fall 2013.
- David Fifer (C.S. 2014), "Interactive Appearance Editing", CS490 Fall 2012/Spring 2013.
- Chris May (C.S. 2013), "3D Acquisition and Appearance Editing Engine", CS490 Spring 2013.
- Yeong-Ouk Kim (C.S. 2013), "Levels of Details for Urban Procedural Modeling", CS490 Summer 2012, CS490 Fall 2012.
- John McCoy Crofts (C.S. 2012), "Educational Games for Learning Percussion Instruments", CS490 Spring 2012.
- Andy Feldkamp (C.G.T., 2011), "Procedural Building Modeling", paid research during 2011.
- Tyler Smith (C.S., 2011), Honors, "GPU-based Photometric Stereo with Unknown Lights" and "Image-based Vision Correction", CS490 Fall 2010/Spring 2011, paid research during Summer 2011.
- Philip Jarvis (C.S., 2011), "Modeling Trees in Large Urban Spaces", CS490 Fall 2010.
- Aaron Link (C.S., 2010), Honors, "Procedural Modeling for Coherent Urban Spaces", paid research and CS490.
- Robert Insley (Math/C.S., 2008), Honors, "Angle-Independent Bundle Adjustment Refinement", CS490.
- Dat Nyugen, Nitin Nalreja, Nimesh Amin (C.S., 2006): "Portable Mixed Reality", CS490
- Jamie Gennis (Math/C.S., 2005), worked for 1.5 years on 3D Acquisition Methods, paid research and CS490.
- Paul Ardis (Math/C.S., 2005), "Mobile Mixed Reality", paid research and CS490.
- Jonathan Deutsch (C.S., 2004): "Mixed-Reality Tabletop", CS490.
- Darin Rajan (C.S., 2005): "Mobile Image Acquisition", CS490.

Research Staff and Paid Visitors

- Chris May (C.S., 2013): graphics programmer, hired 2013-2014.
- Luis Paredes, visiting scholar, “Mobile-Platform Appearance Editing”, Summer 2013.

12. Teaching

Purdue University (2003 – present)

Spring 2025

CS334: Fundamentals of Computer Graphics

CS635: Capturing, Modeling, and Rendering 3D Objects

Fall 2024

CS535: Interactive 3D Computer Graphics

Fall 2023

CS334: Fundamentals of Computer Graphics

CS591: Grad Research Seminar

Spring 2023

CS334: Fundamentals of Computer Graphics

CS635: Capturing, Modeling, and Rendering 3D Objects

Fall 2022

CS591: Grad Research Seminar

Spring 2022

CS334: Fundamentals of Computer Graphics

Fall 2021

CS535: Interactive 3D Computer Graphics

Spring 2021

CS334: Fundamentals of Computer Graphics

Fall 2020

CS590-DVC: Deep Visual Computing

Spring 2020

CS635: Capturing, Modeling, and Rendering 3D Objects

Fall 2019

CS535: Interactive 3D Computer Graphics

CS591: Grad Research Seminar

Spring 2019

CS251: Data Structures and Algorithms

Spring 2018

CS251: Data Structures and Algorithms

Fall 2017

CS334: Fundamentals of Computer Graphics

Spring 2017

CS635: Capturing, Modeling, and Rendering 3D Objects

Fall 2016

CS535: Interactive 3D Computer Graphics

Spring 2016

CS251: Data Structures and Algorithms

Fall 2015

CS334: Fundamentals of Computer Graphics

Spring 2015

CS636: Capturing, Modeling, and Rendering 3D Objects

Fall 2014

CS535: Interactive 3D Computer Graphics

Spring 2014:

CS434: Advanced Computer Graphics

Fall 2013

CS334: Fundamentals of Computer Graphics

Spring 2013

CS434: Advanced Computer Graphics

CS251: Data Structures and Algorithms

Fall 2012

CS535: Interactive 3D Computer Graphics

Spring 2012

CS334: Fundamentals of Computer Graphics

Fall 2010

CS535: Interactive 3D Computer Graphics

Spring 2010

CS635: Capturing, Modeling, and Rendering 3D Objects

CS197/CS497: Honor's Seminar for Freshman and Undergraduate Honors Research Projects

Fall 2009

CS530: Introduction to Scientific Visualization

Spring 2009

CS635: Capturing, Modeling, and Rendering 3D Objects

Fall 2008

CS334: Fundamentals of Computer Graphics

Spring 2008

CS334: Fundamentals of Computer Graphics

Fall 2008

CS535: Interactive 3D Computer Graphics

Spring 2007

CS635: Capturing, Modeling, and Rendering 3D Objects

Fall 2006

CS251: Data Structures and Algorithms

Spring 2006

CS490G: Teaching and Learning Tools using Tablet PCs

Fall 2005

CS535: Interactive 3D Computer Graphics

Spring 2005

CS490G: Sketching and Mixed-Reality on Tablet PCs

CS497: Undergraduate Honors Research Projects

Fall 2004

CS590G: Capturing, Modeling, Rendering 3D Objects", CS590G

CS397/CS497: Undergraduate Honors Research Projects

Spring 2004

CS490T: 3D Sketching on Tablet PCs

CS590M: Model Representations for 3D Objects and Environments

Fall 2003

CS590G: Capturing, Modeling, Rendering 3D Objects

University of North Carolina (1991-1999)

August 2000

ACM SIGGRAPH course "Interactive Walkthroughs of Large Datasets"

August 1999

ACM SIGGRAPH course "Interactive Walkthroughs of Large Datasets"

Summer 1997

CS114: Introduction to Programming

Brown University (1987-1991)

Fall 1989

CS011: Introduction to Computer Science, teaching assistant

Spring 1989

CS012: Fundamentals of Computer Science Architecture, teaching assistant

Fall 1988

CS011: Introduction to Computer Science, teaching assistant

13. Miscellaneous

- Lucent Technologies Global Sciences Scholarship Program Lab Coordinator (2002)
- Lucent Technologies Summer Internship Program Lab Coordinator (2000)
- NSF Science and Technology Center Student Conference Organizer (1992-1993)
- Brown University Computer Science Faculty-Student Liaison (1991)
- ACM Programming Competitions Team Member and International Team Leader (1989, 90, 91)

14. Personal

- Hobbies: vintage cars, vintage computers, sailing, woodworking, model trains, martial arts, soccer, mountain biking
- Languages: speak English and Spanish fluently, some ability in German