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Electronic Visualization Lab
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Research Overview

Research in visual computing, an area of computer science that handles images and 3D models. Emphasis on automated techniques and computational representations for scientific modeling and data visualization.

Education

Ph.D., Computer Science, Brown University, 2007.

Data-Driven Predictive Modeling of Diarthrodial Joints

Research in computer graphics and visualization for biological applications. Created novel computational modeling, visualization, and analysis tools which are needed to model anatomical joints and their variation with disease progression.

Sc.M., Computer Science, Brown University, 2001.

Estimating Ligament Lengths from Bone Kinematics and Surfaces

M.S., Computer Science & Electrical Engineering, Politehnica University, Romania, 1998.

KQML – Communication among Intelligent Agent Systems

B.S., Computer Science & Electrical Engineering, Politehnica University, Romania, 1997.

Time-delay Neural Network System for Speech Recognition

Experience and Appointments

Current:

Associate Professor, Department of Computer Science, University of Illinois at Chicago,
Jan 2015 – current.

Computational research into robust, scalable and effective computer science and visualization tools to solve problems in science and engineering. Multiple outstanding research honors. Multiple NSF and NIH R01 awards. Specific research projects in the past two years include: precision medicine in medical imaging, biology visualization, machine learning for the visualization of large scale tensor-valued fields, foundations for the visual integration of spatial and non-spatial information, and usability of large, immersive displays to biomed and to collaborative applications.

Project management, fund raising, grant management, interdisciplinary collaboration, public communication, results dissemination, software engineering, software deployment, teaching, advising and mentoring.

Past:

Visiting Faculty, Robotics Institute, Carnegie Mellon University, May 2014 – Dec 2014.

Computational modeling research to help solve problems in robotics and computer animation.

Assistant Professor, Department of Computer Science, University of Pittsburgh, July 2007 – Sept 2014.

Founder and Director of the [Interdisciplinary Visualization Lab](#). Twice Pitt Faculty Honoree for most outstanding research accomplishments. NSF CAREER Award. Three Outstanding Paper awards. One US patent, preceded by technology transfer to industry. Excellent record in rising federal funding for research. One NSF Graduate Fellowship to my student. Six Teaching Awards, five based on student feedback and one at the Provost level. Founder and advisor to the Pitt Women in CS student organization; outreach activities. Departmental tenure recommendation, thank you. Moved on.

Specific research projects include visualization of large scale vector-valued and tensor-valued fields, visual integration of spatial and non-spatial information, visualization and cross-registration of large-scale, multivariate data, intelligent algorithms for automated tracking of orthopaedic data, geometric tools for tissue modeling and simulation.

Project management, lab management and directing, fund raising, grant management, interdisciplinary collaboration, public communication, results dissemination, software engineering, software deployment, teaching, advising and mentoring.

Joint Assistant Professor, Department of Computational and Systems Biology, University of Pittsburgh School of Medicine, Secondary Appointment, 2009 – 2014.

Visualization, modeling and simulation for rule-based biochemical systems.

Adjunct Assistant Professor of Computer Science, Robotics Institute, Carnegie Mellon University, 2007 – 2014.

Computational modeling research to help solve problems in robotics and computer animation.

Research Assistant, Brown University, 2000 – 2007.

Interdisciplinary work in articulation modeling and visualization (CS, Bioengineering, Orthopedics, Evolutionary Biology).

CS Faculty-Graduate Liaison, Brown University, 2003 – 2005.

Lobbied and raised funding for grad student interests.

Instructor, Brown University, 2004.

“Interactive Computer Graphics”, full class responsibility together with fellow graduate students M. McGuire and T. Moscovich

Teaching Assistant, Brown University, 2003.

“Interactive Computer Graphics”. Led seminars and help-sessions, guest-lectured, mentored final projects.

Research intern, Philips Research, Netherlands, Summer 1998.

Designed and implemented a geometry compression engine for video-games.

Lab instructor, Politehnica University, Romania, 1997 – 1999.

Introductory Programming, Data Structures and Algorithms, Scientific Computing, Parallel Processing. Taught seminars and labs, designed and graded assignments and independent-study projects.

Intern, Electromagnetica Ltd, Romania, Summers 1992, 1994.

Programmed parts of a VLSI-circuit design project.

Honors and Awards

- 2017 **National Institutes of Health R01 Award**, Early Stage Investigator
- 2017 **IEEE Visual Analytics Science and Technology (VAST) Challenge 2017 Honorable Mention (MC2)**, IEEE VIS 2017
- 2017 **IEEE Visual Analytics Science and Technology (VAST) Challenge 2017 Honorable Mention (MC3)**, IEEE VIS 2017
- 2017 UIC College of Engineering Young Researcher of the Year award
- 2016 **IEEE VGTC Visualization Pioneers Group (VPG) Data Visualization Contest Honorable Mention**, IEEE VIS 2016
- 2013 **IEEE Biology Visualization Data Contest Visualization Award**, IEEE BioVis 2013
- 2013 Pitt CS Teaching Award Nomination, Graduate seminar level
- 2012 **IEEE Large Data Analysis and Visualization Honorable Mention** (Best-Paper Runner-Up Award), IEEE LDAV 2012
- 2012 Desire2Learn Edge Challenge shortlist (\$25K teaching-industry competition)
- 2012 **Computing Research Association-W Advanced Career Mentoring Workshop Travel Award**
- 2012 Pitt CS Teaching Award, Graduate course level
- 2011 **IEEE Biology Visualization Best Paper Award**, IEEE BioVis 2011; Pitt faculty honoree
- 2011 Pitt CS Teaching Award, Upper-level undergraduate course
- 2010 Pitt CS Teaching Award, Upper-level undergraduate course, top 4% in School of A&S
- 2010 **National Science Foundation CAREER Award**; Pitt faculty honoree
- 2009 Pitt Speaking in the Disciplines Fellowship
- 2009 Pitt CS Teaching Award, Graduate course, top 4% in School of A&S
- 2009 **Innovation in Education Award**, Pitt Provost's Advisory Council on Instructional Excellence
- 2008 Pitt CS Teaching Award, Graduate seminar

- 2004 **ACM SIGGRAPH Student Research Competition semifinalist** – twice, first nomination with students Peter Sibley and Phil Montgomery; and second with students Ethan Bromberg and Arni Jonsson. Brown University Travel Grant and **ACM Travel Awards**.
- 2001 **Pixar Fellowship**
- 2000 **Microsoft Fellowship**
- 1999 **Brown University Fellowship**
- 1997,1996 **Romanian National ‘Scholar Merit’ Fellowship**
- 1996 **Best Paper Award** at the Politehnica Bioengineering’96 Scientific Session

Pitt CS Teaching Awards reward most-effective teaching at specific levels during the previous academic year; measured using the University-conducted student-evaluations of courses and instructors.

Journal Publications¹

J22. G.E. Marai

“Activity-centered Domain Characterization for Problem-Driven Scientific Visualization”, IEEE Transactions on Visualization and Computer Graphics, (Proceedings of the Visual Analytics Science and Technology / Information Visualization / Scientific Visualization 2017), vol. 24, no. 01, pp. 1-10, Jan 2018 **(IF 1.9)**

J21. C. Ma, F. Pelloio, D. Llano. R. Kenyon, G.E. Marai, "RemBrain: Exploring Dynamic Biospatial Networks with Mosaic-Matrices and Mirror Glyphs", Journal of Imaging Science and Technology, Vol. 0(0), pp. 1--12, 2018 **(IF 0.4)**

J20. MD Anderson Head and Neck Cancer Quantitative Imaging Collaborative Group, "Investigation of radiomics-based signature for local recurrence using primary tumor texture analysis in oropharyngeal head and neck cancer patients", Nature Scientific Reports, Vol. 0(0), pp. 1--12, 2018 **(IF 5.5)**

J19. MD Anderson Head and Neck Cancer Quantitative Imaging Collaborative Group "Investigation of radiomics-based signature for local recurrence using primary tumor texture analysis in oropharyngeal head and neck cancer patients", Nature Scientific Reports, 2017 **(IF 5.5)**

¹ In most cases, the last author listed denotes the project leader. In rare cases where the project leader is not listed last, they are indicated with an asterisk – *. IF x.xx – impact factor.

J18. Multidisciplinary Larynx Cancer Working Group

(Alphabetically: B. Beadle, G. Canahuate, A. El-Naggar, S. Frank, C.D. Fuller*, A. Garden, N. Gross, G.B. Gunn, K. Hutcheson, S. Lai, J. Lewin, M. Kies, G.E. Marai, A.S.R. Mohamed, W. Morrison, C. Mulcahy, J. Phan, D. Rosenthal, P. Sevak, T. Sheu, D. Vock, R. Weber, and M. Zafereo)

“Conditional Survival Analysis of Patients With Locally Advanced Laryngeal Cancer: Construction of a Dynamic Risk Model and Clinical Nomogram”, *Nature Scientific Reports* 7, 2017 (**IF 5.5**)

J17. H. Elhalawani, A.S.R. Mohamed, A. White, J. Zafereo, A. Wong, J. Berends, S. AboHashem, B. Williams, J. Aymard, A. Kanwar, S. Perni, C. Rock, L. Cooksey, S. Campbell, Y. Ding, S. Lai, G.E. Marai, D. Vock, G. Canahuate, J. Freymann, K. Farahani, J. Kalpathy-Cramer, C.D. Fuller

“Matched computed tomography segmentation and demographic data for oropharyngeal cancer radiomics challenges”, *Nature Scientific Data* 4 (Article Number 170077): 1-14, 2017 (**IF 4.29**)

J16. A Kanwar, AS Mohamed, LE Court, L Zhang, GE Marai, G Canahuate, JS Lee, S Perni, JA Messer, BH Pham, B Youssef, D Vock, A Rao, J Kalpathy-Cramer, GB Gunn, DI Rosenthal, CD Fuller,

“Development of a Predictive Quantitative Contrast Computed Tomography-Based Feature (Radiomics) Profile for Local Recurrence in Oropharyngeal Cancers”, *International Journal of Radiation Oncology, Biology, Physics* 96(2):S191, 2016 (**IF 4.49**)

J15. C. Ma, T. Luciani, A. Terebus, J. Liang, G.E. Marai,

“PRODIGEN: Visualizing the probability landscape of stochastic gene regulatory networks in state and time space”, pp 1-13, *BMC Bioinformatics* 18(2):24, 2017 (**IF 2.4**)

J14. G.E. Marai*, T. Luciani, A. Maries, L. Yilmaz, M. Nik.

“Visual Descriptors for Dense Tensor Fields in Computational Turbulent Combustion: A Case Study”, pp. 1-11, *Journal Imaging Science and Technology*, 2016(1) (**IF 0.4**)

J13. J. Aurisano, K. Reda, A. Johnson, G.E. Marai, J. Leigh,

“BactoGeNIE: A Large-Scale Comparative Genome Visualization for Big Displays”, *BMC Bioinformatics Journal*, pp. 1-13, 16(11):S6, 2015. (**IF 2.58**)

J12. J. Wenskovitch, L.A. Harris, J.J. Tapia, J.R. Faeder, G.E. Marai,

“MOSBIE: A Tool for Comparison and Analysis of Rule-Based Biochemical Models”, *BMC Bioinformatics Journal*, pp. 1-21, 15 (1):316, 2014. (**IF 2.68**)

J11. T. Luciani, J. Wenskovitch, K. Chen, D. Koes, T. Travers, G.E. Marai,

“FixingTIM: Interactive Exploration of Sequence and Structural Data to Identify Functional Mutations in Protein Families”, *BMC Proceedings* (Vol. 8, No. 2, p. S3), pp. 1-10, 2014.

J10. T. Luciani, B. Cherinka, S. Myers, W.M. Wood-Vasey, A. Labrinidis, G.E. Marai,

“Large-Scale Overlays and Trends: Visually Mining, Panning and Zooming the Observable Universe”, *IEEE Transactions on Visualization and Computer Graphics*, 20(7), pp.1048-1061, 2014. (**IF 2.21**)

J9. A. Maries, N. Mays, M. Olson Hunt, K. Wong, W. Layton, C. Rosano, R. Boudreau, G.E. Marai,

“GRACE: A Visual Comparison Framework for Integrated Spatial and Non-Spatial Geriatric Data”, *IEEE Transactions on Visualization and Computer Graphics*, 19(12), pp.2916-2925, Oct 2013. (**IF 2.21**)

- J8. Md. A. Haque, W. Anderst, S. Tashman, G.E. Marai,
“Hierarchical Dynamic Model-based Tracking of Cervical Vertebrae from Fluoroscopy Images”, *Journal Medical Physics and Engineering*, 35(7): 994-1004, July 2013. **(IF 2.11)**
- J7. A.M. Smith, W. Xu, Y. Sun, J.R. Faeder, G.E. Marai,
“RuleBender: Integrated Modeling, Simulation and Visualization for Rule-Based Intracellular Biochemistry”, *BMC Journal Bioinformatics*, 13 (Visualization Issue, Suppl 8):S3: 1-16, Jun 2012. **(IF 3.02)**
- J6. W. Xu, A. Smith, J.R. Faeder, G.E. Marai,
“RuleBender: A Visual Interface for Rule-Based Modeling”, *Bioinformatics Journal*, 27: 1721-2, Apr 2011 **(IF 5.47)**
- J5. J.S. Albrecht, R. Hwa, G.E. Marai,
“The Chinese Room: Visualization and Interaction to Understand and Correct Ambiguous Machine Translation”. *Computer Graphics Forum* 28: 1047-1054, (*Eurographics/IEEE Symposium on Visualization, Proceedings of*), June 2009. **(IF 1.64)**
- J4. G.E. Marai*, C.M. Grimm, D.H. Laidlaw,
“Arthrodiar Joint Markerless Cross-Parameterization and Biomechanical Visualization”, *IEEE Transactions on Visualization and Computer Graphics* 13(5): 1095-1104, Sep/Oct 2007. **(IF 2.22)**
- J3. J.J. Crisco*, D. Moore, G.E. Marai, D.H. Laidlaw, E. Akelman, A.C. Weiss, S.W. Wolfe,
“Effects of Distal Radius Malunion on Distal Radioulnar Joint Mechanics—An In Vivo Study”, *Journal of Orthopedic Research* 25(4): 547-555, Jan. 2007. **(IF 2.81)**
- J2. G.E. Marai, J.J. Crisco, D.H. Laidlaw,
“Super-Resolution Registration Using Tissue-Classified Distance Fields”, *IEEE Transactions on Medical Imaging*, 25(2): 177-187, Feb. 2006. **(IF 3.64)**
- J1. G.E. Marai, C. Demiralp, S. Andrews, C.M. Grimm, J.J. Crisco, D.H. Laidlaw,
“Estimating Joint Contact Areas and Ligament Lengths from Bone Kinematics and Surfaces”, *IEEE Transactions on Biomedical Engineering*, 51(5): 790-799, May 2003 **(IF 2.28)**

Edited Collections

- E6. *Proceedings of the Symposium on Biological Data Visualization at VIS 2016*, J. Aerts, A. Lex, G.E. Marai, M. Streit, D. Weiskopf, *BMC Bioinformatics*, 18 (Suppl 2), BioMed Central 2017
- E5. *Highlights from the 5th Symposium on Biological Data Visualization: Part 1*. J. Aerts, G.E. Marai, K. Nieselt, C. Nielsen, M. Streit, D. Weiskopf. *BMC Bioinformatics*, 16(Suppl 11):S1, BioMed Central 2015
- E4. *Highlights from the 5th Symposium on Biological Data Visualization: Part 2*. J. Aerts, G.E. Marai, K. Nieselt, C. Nielsen, M. Streit, D. Weiskopf, *BMC Proceedings*, 9(Suppl 6):S1, BioMed Central 2015

E3. *BMC Bioinformatics Biological Data Visualization Series*, G.E. Marai, S. O'Donoghue, C. Bartlett and J. Aerts, BioMed Central, July 2014.

E2. *IEEE Third Symposium on Biological Data Visualization Proceedings*, G.E. Marai and K. Nieselt, pp. 1-130, IEEE Computer Society, Oct 2013.

E1. *Special Section on Biomedical Applications: From Data Capture to Modeling*, IEEE Computer Graphics & Applications, C. Grimm and G.E. Marai, pp. 20-80, IEEE Computer Society, Sept/Oct 2012.

Book Chapters (peer-reviewed)

B5. M. Monfort, T. Luciani, J. Komperda, B. Ziebart, F. Mashayek, G.E. Marai.
"A Deep Learning Approach to Identifying Shock Locations in Turbulent Combustion Tensor Fields", in *Modelling, Processing and Visualization of Anisotropy*, Editors: I. Hotz, T. Schultz, E. Ozarslan (editors), Mathematics and Visualization Series, Springer 2017.

B4. A. Maries, T. Luciani, P. Pesciuneri, M. Nik, S.L. Yilmaz, P. Givi, G.E. Marai,
"A Clustering Method for Identifying Regions of Interest in Turbulent Combustion Tensor Fields", *Visualization and Processing of Higher Order Descriptors for Multi-Valued Data*, pp. 323 -338, I. Hotz and T. Schultz (editors), Springer 2015.

B3. M. Hlawitschka, I. Hotz, A. Kratz, G.E. Marai*, R. Moreno, G. Scheuermann, M. Stommel, A. Wiebel, E. Zhang,
"Top Challenges in the Visualization of Engineering Tensor Fields", *Visualization and Processing of Tensors and Higher-Order Descriptors for Multi-field Data*, pp. 3 – 15, B. Burgeth, A. Vilanova and C.F. Westin (editors), Springer 2014.

B2. A. Maries, Md.A. Haque, S.L. Yilmaz, M.B. Nik, G.E. Marai,
"Interactive Exploration of Stress Tensors Used in Computational Turbulent Combustion", *New Developments in the Visualization and Processing of Tensor Fields*, pp. 137 – 156, D. Laidlaw and A. Vilanova (editors), Springer 2012.

B1. D.H. Laidlaw, G.E. Marai, K.E. Fleischer, A. Barr,
"Partial Volume Segmentation and Boundary Distance Estimation with Voxel Histograms", in *Handbook of Medical Imaging: Processing and Analysis*, 2nd edition, pp. 223 – 244, I.N. Bankman (editor), Academic Press 2010.

Peer-reviewed Conference Papers

C--. G.E. Marai
"Activity-centered Domain Characterization for Problem-Driven Scientific Visualization", *IEEE VIS 2017*, pp. 1-10, SciVis'17 (cross-listed as J20 above).

- C20. M. Thomas, T. Kanampallil, J. Abraham, GE Marai,
"Echo: A Large Display Interactive Visualization of ICU Data for Effective Care Handoffs", pp.1-8, The 8th IEEE Workshop on Visual Analytics in Healthcare VAHC'17, 2017.
- C19. V. Doshi, S. Tuteja, K. Bharadwaj, D. Tantillo, T. Marinnan, J. Patton, G.E. Marai,
"StickySchedule: An Interactive Multi-user Application for Conference Scheduling on Large-scale Shared Displays", pp. 1-8, The 6th ACM International Symposium on Pervasive Displays PerDis'17, 2017.
- C18. S. Kitsiou*, M. Thomas, G.E. Marai, N. Maglaveras, G. Kondos, R. Arena, B. Gerber,
"Development of an innovative mHealth platform for remote physical activity monitoring and health coaching of cardiac rehabilitation patients", 2017 IEEE International Conference on Biomedical and Health Informatics (top 14%), 2017
- C--. C. Ma, T. Luciani, A. Terebus, J. Liang, G.E. Marai,
"PRODIGEN: Visualizing the probability landscape of stochastic gene regulatory networks in state and time space", pp 1-13, IEEE BioVis 2016 (cross-listed as J16 above)
- C17. D. McNamara, J. Tapia, C. Ma, T. Luciani, A. Burks, J. Trelles, and G.E. Marai,
"Spatial Analysis of Employee Safety Using Organizable Event Quiltmaps", pp. 1-4, IEEE VIS 2016 The Event Event: Temporal & Sequential Event Analysis Workshop, Oct. 2016.
- C16. G.E. Marai, A. Forbes, A. Johnson,
"Interdisciplinary Immersive Analytics at the Electronic Visualization Laboratory: Lessons Learned and Upcoming Challenges", IEEE Virtual Reality Workshop on Immersive Analytics, pp 1-6, 2016
- C15. K. Bharadjaw, S. Flores, J. Rodriguez, L. Long, G.E. Marai,
"Developing a Scalable SNMP Monitor", IEEE IPDPS (International Parallel and Distributed Processing Symposium) Workshop on High Performance Data Analysis and Visualization, pp.1-4, 2016
- C--. G.E. Marai*, T. Luciani, A. Maries, L. Yilmaz, M. Nik.
"Visual Descriptors for Dense Tensor Fields in Computational Turbulent Combustion: A Case Study", pp. 1-12. Conference on Visualization and Data Analysis 2016, Part of IS&T Electronic Imaging 2016 (cross-listed as J15 above)
- C14. G.E. Marai,
"Visual Scaffolding in Integrated Spatial and Nonspatial Visual Analysis", pp. 1-5, The Sixth International Eurovis Workshop on Visual Analytics EuroVA'15, May 2015
- C-. J. Aurisano, K. Reda, A. Johnson, G.E. Marai, J. Leigh,
"BactoGeNIE: A Large-Scale Comparative Genome Visualization for Big Displays", pp. 1-13, The Fifth Symposium on Biological Data Visualization BioVis'15, July 2015. (cross-listed as J14 above)

- C13. J. Wenskovitch, T. Luciani, K. Chen, G.E. Marai,
“Fixing TIM: Identifying Functional Mutations in Protein Families through the Interactive Exploration of Sequence and Structural Data”, IEEE BioVis 2013 Data Competition, pp. 1–4, 2013. **IEEE BioVis’13 Data Contest Visualization Award.**
- C-. A. Maries, N. Mays, M. Olson, K. Wong, W. Layton, C. Rosano, R. Boudreau, G.E. Marai,
“GRACE: A Visual Comparison Framework for Integrated Spatial and Non-Spatial Geriatric Data”, IEEE VIS 2013 (formerly VisWeek, formerly IEEE Visualization) SciVis, pp.1-10, Oct 2013. (cross-listed as J9 above)
- C12. Md. A. Haque, G. E. Marai,
“A Semi-Automated Method for Subject-Specific Modeling of the Spinal Canal from Computed Tomography Images and Dynamic Radiographs”, The 18th International Workshop on Vision, Modeling and Visualization, pp. 1–8, Sep 2013.
- C11. Md.A. Haque, G.E. Marai,
“Image to Mesh: Spinal Ligament 2D Surface Models from Bone Volume Images and Dynamic Radiographs”, MICCAI 2013 Workshop on Mesh Processing in Medical Image Analysis, pp. 1-12, Sept 2013.
- C10. M. Liang, J. Guerra, G.E. Marai, P. Brusilovsky,
“Collaborative E-Learning through Open Social Student Modeling and Progressive Zoom Navigation”, The 8th IEEE International Conference on Collaborative Computing: Networking, Applications and Worksharing, pp. 1-10, Oct 2012. **Desire2Learn Edge Challenge shortlist.**
- C9. T. Luciani, S. Myers, B. Sun, B. Cherinka, W.M. Wood-Vassey, A. Labrinidis, G.E. Marai,
“Panning and Zooming the Observable Universe with Prefix-Matching Indices and Pixel-Based Overlays”, IEEE Large-scale Data Analysis and Visualization Symposium, pp. 1-8, Oct 2012. **Best-Paper Runner-Up Award.**
- C8. P. Neophytou, R. Gheorghiu, R. Hachey, T. Luciani, B. Sun, A. Labrinidis, G.E. Marai, P. K. Chrysanthis,
“AstroShelf: Understanding the Universe through Scalable Navigation of a Galaxy of Annotations”, SIGMOD 2012 System Demonstrations, pp. 1-4, May 2012.
- C7. A.M. Smith, W. Xu, Y. Sun, J.R. Faeder, G.E. Marai,
“RuleBender: Integrated Visualization for Biochemical Rule-Based Modeling”, IEEE Visualization 2011, IEEE BioVis: Symposium on Biological Data Visualization, pp.1-8, Oct 2011. **Best Paper Award.**
- C6. W. Xiong, D. Litman, G.E. Marai,
“Analyzing Prosodic Features and Student Uncertainty using Visualization”, Association for the Advancement of Artificial Intelligence Fall Symposium (AAAI-FS’09), pp. 1-6, Nov 2009.
- C5. G.E. Marai*, J.J. Crisco, D.H. Laidlaw,
“Development of a Kinematic 3D Carpal Model to Analyze In Vivo Soft-Tissue Interaction Across Multiple Static Postures”, IEEE 31st Conf. of the Engineering in Medicine and Biology Society (EMBC’09), pp. 7176–7179, Sept. 2009. (Podium)

C-. J.S. Albrecht, R. Hwa, G.E. Marai,
 “The Chinese Room: Visualization and Interaction to Understand and Correct Ambiguous Machine Translation”, Eurographics/IEEE Symposium on Visualization, Proceedings of, pp. 1-8, June 2009
(cross-listed as J5 above)

C4. J. Albrecht, R. Hwa*, G.E. Marai,
 “Correcting Automatic Translations through Collaborations between MT and Monolingual Target-Language Users”, EACL 2009, 12th Conference of the European Chapter of the Association for Computational Linguistics, pp. 60-68, Mar. 2009.

C3. G.E. Marai, J.J. Crisco, D.H. Laidlaw,
 “A Kinematics-Based Method for Evaluating the Stabilizing Role of Ligaments in the Carpal Joint”, 16th Annual Symposium on Computational Methods in Orthopaedic Biomechanics, Computational Modeling track, pp. 1-4, Mar. 2008 (Podium).

C2. G.E. Marai, J.J. Crisco, D.H. Laidlaw,
 “A Kinematics-Based Method for Generating Cartilage Maps and Deformations in the Multi-Articulating Wrist Joint From CT Images”, IEEE 28th Conf. of the Engineering in Medicine and Biology Society (EMBC’06), pp. 2079-2082, Sept. 2006.

C1. G.E. Marai*, A. Ivan,
 “Neural Networks versus Fuzzy Logic”, Politehnica Bioengineering Scientific Session, pp. 1-10, Politehnica University of Bucharest, pp. 1-10, May 1996. **Best paper award.**

Peer-reviewed Conference Short Papers, Abstracts and System Demonstrations

Several short papers have higher citation counts than TVCG papers, several are ACM Student Research semifinalists or other award winners, several have 10% (podium) selection or acceptance rates etc.

S32. J. Castor, J. Borowicz, A. Burks, M. Thomas, T. Luciani, G.E. Marai, "MC2 - Mining Factory Pollution Data through a Spatial-Nonspatial Flow Approach", IEEE Visual Analytics Science and Technology (VAST) Challenge 2017 Proceedings, pp. 1-2, 2017. **VAST Challenge Honorable Mention (MC2)** in competition with 56 submissions from teams in academia, industry, and government

S31. D. Kirilov, I. Lindmae, A. Burks, C. Ma, G.E. Marai
 "MC1: A Bespoke Analysis Tool for Spatio-temporal Park Traffic Data"
 IEEE Visual Analytics Science and Technology (VAST) Challenge 2017 Proceedings, pp. 1-2, 2017.

S30. V. Mahida, B. Kupiec, A. Burks, T. Luciani, G.E. Marai, "MC3 - A Web-Based Interactive Image Explorer for Temporal Analysis of Satellite Images", IEEE Visual Analytics Science and Technology (VAST) Challenge 2017 Proceedings, pp. 1-2, 2017. **VAST Challenge Honorable Mention (MC3)** in competition with 56 submissions from teams in academia, industry, and government

S29. H. Elhalawani et al
 “Predicting the HPV P16 Status of Oropharyngeal Cancer Patients Using Radiomics and an Ensemble of Random Forests”, Radiology Society of North America meeting RSNA 2017 (podium)

- S28. H. Elhalawani et al
“Normal Tissue Radiomic Feature Kinetics in Oropharyngeal Cancers Treated with Image-Guided Radiation Therapy: Assessment of Parotid Glands Textural Changes on Daily Non-contrast CT”, Radiology Society of North America meeting RSNA 2017
- S27. C. Ma, A. Burks, T. Luciani, A. Terebus, J. Liang, G.E. Marai
“Visualizing ensemble time-evolving probability landscapes of stochastic networks”, ISMB/ECCB 2017, pp. 1-2, BioVis’17
- S26. T. Luciani et al, “Multi-scale Voronoi-based ACT Assessment”, IEEE VIS VPG Data Contest, pp. 1-2, Oct 2016. **Honorable Mention.**
- S25. A. Kanwar, M.A.S. Radwan, L. Court, J.S. Lee, A. Rao, J. Kalpathy-Cramer, D.Vock, G.E. Marai, G. Canahuate, G.B. Gunn, J. Zhang, C.D. Fuller, “Contrast-enhanced CT (CE-CT) Texture Analysis Radiomic Analysis of Pretreatment Contrast-Enhanced CT Imaging Predicts Local Failure in Oropharyngeal Cancers Treated with Radiotherapy”, pp. 1-2, ASTRO 2016, Sep 2016
- S24. T. Luciani, C. Ma, J. Trelles, F. Pelollio, G.E. Marai, “Developing a Data-Driven Wiki of Spatial-Nonspatial Integration Tools”, IEEE VIS C4PGV Workshop 2016, pp.1-1, Oct 2016.
- S23. A. Burks, C. Sugiyama, T. Luciani, J. Komperda, G.E. Marai, “Interactive Exploration and Tracking of Ensemble Viscous Fingers”, IEEE VIS SciVis Data Contest 2016, IEEE VIS 2016, pp. 1-2, Oct 2016.
- S22. P. Hanula, K. Piekutowski, C.Uribe, K. Almryde, A. Nishimoto, J. Aguilera, G.E. Marai, “Cavern Halos: Exploring Spatial and Nonspatial Cosmological Data in an Immersive Virtual Environment”, Virtual and Augmented Reality, 3D, and Stereoscopic Systems Conference Poster Compendium, Electronic Imaging ’16, Feb 2016
- S21. T. Luciani, A. Maries, M. Nik, L. Yilmaz, G.E. Marai, “Visualization of Tensor Quantities Used in Computational Turbulent Combustion”, American Physical Society, Division of Fluid Dynamics (APS DFD) Conference 2013, pp. 1-1, Nov 2013.
- S20. J. Wenskovitch, L. Harris, J. Faeder, G.E. Marai, “A Journaling System for Rule-Based Biochemical Models”, IEEE BioVis Posters Compendium, pp. 1–1, Oct 2013.
- S19. T. Luciani, A. Maries, H. Tran, M. Nik, S.L. Yilmaz, G.E. Marai, “A Novel Method for Tracking Tensor-based Regions of Interest in Large-Scale, Spatially-Dense Turbulent Combustion Data”, IEEE Visualization 2012, Poster Abstracts with System Demonstration, pp. 1-2, Oct 2012.
- S18. Md. A. Haque, W. Anderst, S. Tashman, G.E. Marai, “Validation of a Non-invasive Automated Hierarchical Method to Precisely Measure Lumbar Spine Movement”, The 2012 Annual Meeting of the Orthopaedic Research Society, Image Processing track, pp. 1, March 2012.
- S17. T. Luciani, R. Hachey, D.Q. Oliphant, B.A. Cherinka, G.E. Marai, “Pixel-based Overlays for Navigating a Galaxy of Observations”, IEEE Visualization 2011, Large-scale Data Analysis and Visualization Symposium, Poster Abstracts with System Demonstration, pp. 1-2, Oct 2011.
- S16. A. Maries, S. Mandayam, C. Rosano, G.E. Marai, “Visual Analysis of Brain/Gait Correlations”, IEEE Visualization 2011, Poster Abstracts with System Demonstration, pp. 1-2, Oct 2011.

- S15. S.D. Rothenberger, J.E. Wenskovitch, G.E. Marai, “Pexel and Heatmap Visual Analysis of Multidimensional Gun/Homicide Data”, IEEE Visualization 2011, Visual Analytics Science and Technology, Poster Abstracts with System Demonstration, pp. 1-2, Oct 2011.
- S14. A. Smith, W. Xu, J.R. Faeder, G.E. Marai, “Scalable Global Views for Biological Rule-Based Modeling”, IEEE Visualization 2011, InfoVis Poster Abstracts with System Demonstration, pp. 1-2, Oct 2011.
- S13. Md. A. Haque, A. Maries, S.L. Yilmaz, M.B. Nik, G.E. Marai, “Tensor Visualization in Computational Turbulent Combustion: A Case Study”, IEEE Visualization 2010, Poster Abstracts with System Demonstration, pp. 1-2, Oct 2010.
- S12. G.E. Marai, J.J. Crisco, D.H. Laidlaw, “Estimation of Optimal Carpal Contact in the Human Wrist from Multiple Static Articulation Postures”, 2009 Biomedical Engineering Society (BMES) Annual Meeting, Computational Modeling track, pp.1, Oct 2009 (Podium).
- S11. G.E. Marai, “MyWorld4D: Introduction to Computer Graphics with a Modeling and Simulation Twist”, ACM SIGGRAPH 2009, Education Talks Track, pp. 1, Aug. 2009.
- S10. A.M. Smith, J.J. Geiger, G.M. Kapfhammer, M. Renieris, G.E. Marai, “Interactive Coverage Effectiveness Multiplots for Evaluating Prioritized Regression Test Suites”, IEEE Visualization 2009, Poster Abstracts with System Demonstration, pp. 1-2, Oct 2009.
- S9. J.S. Albrecht, R. Hwa, G.E. Marai, “The Chinese Room – Understanding and Correcting Machine Translation”, IEEE Information Visualization 2008, Poster Abstracts with System Demonstration, pp. 1-2, Oct. 2008.
- S8. G.E. Marai*. D.H. Laidlaw, “Markerless inter-subject bone shape matching using 2D projections”, Medical Image Computing and Computer Assisted Intervention (MICCAI) 2005, pp. 1-2, 2005.
- S7. G.E. Marai, C. Demiralp, S. Andrews, D.H. Laidlaw, “JointViewer – an interactive system for exploring orthopedic data”, IEEE Visualization 2004, Poster Abstracts with System Demonstration, pp. 1-2, 2004.
- S6. E. Bromberg, A. Jonsson, G.E. Marai*, M. McGuire, “Hybrid Billboard Clouds for Model Simplification”, ACM SIGGRAPH Poster Compendium, pp. 1-2, 2004. **ACM Student Research Competition semifinalist.**
- S5. P. Sibley, P. Montgomery, G.E. Marai, “Wang Cubes for Video Synthesis and Geometry Placement”, ACM SIGGRAPH Poster Compendium, pp. 1-2, 2004. **ACM Student Research Competition semifinalist.**
- S4. J.J. Crisco*, G.E. Marai, D.H. Laidlaw, D. Moore, E. Akelman, “Kinematic and mechanical changes in the distal radioulnar joint (DRUJ) of patients with malunited distal radius fractures”, 49th Annual Meeting of the Orthopaedic Research Society, Computational Modeling track, pp. 1, 2003.
- S3. G.E. Marai, D.H. Laidlaw, J.J. Coburn, M.A. Upal, J.J. Crisco, “A 3D Method for Segmenting and Registering Carpal Bones from CT Volume Images”, Annual Meeting of the American Society of Biomechanics, Medical Imaging track, pp. 1, 2003.

S2. G.E. Marai, D.H. Laidlaw*, C. Demiralp, C. Grimm, J.J. Crisco, D. Moore, and E. Akelman, "Contact Areas and Ligament Lengths are Abnormal in Patients with Malunited Distal Radius Fracture Despite Normal Radioulnar Kinematics", 4th World Congress Biomechanics, Computational Modeling track, pp.1-2, 2002.

S1. C. Demiralp, G.E. Marai, S. Andrews, D.H. Laidlaw*, J.J. Crisco, C. Grimm, "Modeling and Visualization of Inter-Bone Distances in Joints", IEEE Visualization 2001, Work in Progress Proceedings, pp. 24-25, 2001.

Other Publications

O5. B. Habtegiorgis, E. Kreft, T. Luciani, G.E. Marai, "Visual Encodings for Immersive Visualization of Turbulent Combustion Data", Tapia Conference, pp 1-2, Sep 2016.

O4. C. Uribe, P. Hanula, K. Piekutowski, A. Nishimoto, K. Almryde, J. Aguilera, G.E. Marai, "3D Immersive Color-Mapping of Large Astronomical Data", Tapia Conference, pp 1-2, Sep 2016.

O3. D.Q. Oliphant, G.E. Marai, "Real Time Ray Tracing in a Space Limited Environment", Technical Report TR-2011-03, University of Pittsburgh, Computer Science Department, 2010.

O2. A.M. Smith, W. Xu, Y. Sun, J.R. Faeder, G.E. Marai, "Visual Tools for Modeling and Simulation of Cell Signaling Networks", Carnegie Mellon Bioimaging Informatics Symposium, Sep 2010.

O1. G.E. Marai, "Geometry Compression of DirectX Files", Technical Report 322/98, Philips Research, September 1998 (company-restricted distribution).

Patents

Intelligent algorithms for tracking three-dimensional skeletal movement from dynamic stereo-radiographic image sequences, S. Tashman; G.E. Marai; Md.A. Haque; US Patent 9,538,940, Jan 2017. Technology transfer (exclusive license) to C-Motion Inc, March 2016.

Software

Created, maintained, deployed and/or freely distributed

Englewood Social Service Finder: a freely-available, web-based visual interface for making social service data available to young people in Englewood, Chicago. Sponsored by the Feinberg Foundation.

<https://uic-evl.github.io/EnglewoodSocialServices/>

StickySchedule: a freely-available, open-source tool for collaboratively scheduling conference sessions on large displays. Available under EVL's SAGE2 middleware.

SAGEBoard: an open-source interactive application for collaborative use of large displays as a whiteboard. Available under EVL's SAGE2 middleware.

CavernHalos: a free and open-source immersive 3D application for exploring dark matter simulation data in a CAVE2 environment. Available under EVL's CAVE2 environment.

RuleBender: a free visual tool for constructing, debugging, simulating and analyzing rule-based biological models. Distribution for Windows, Linux and OSX, 32 bit and 64 bit. More than 1,000 downloads in 2012 alone.

<http://www.rulebender.org>

GRACE: a visual comparison tool for integrated spatial and non-spatial geriatric data. Distribution for Linux and OSX, commissioned by and deployed to the Pitt Graduate School for Public Health. Described as their "Dream Tool" by the user.

Fixing TIM: a visual mining and analysis tool to help identify protein mutations across family structural models, and to help discover the effect of these mutations on protein function. Linux distribution, currently in beta-release. IEEE BioVis 2013 Data Contest Visualization Award.

<http://visualizlab.org/fixingTIM>

MOSBIE: an interactive model exploration system for tracking the features and development history of a family of biochemical models, and for identifying similarities and differences between biochemical models.

<http://visualizlab.org/mosbie>

Astroshelf: a "Scientific Google Sky", designed and implemented from scratch; its power and flexibility enables it to serve the needs of the scientific astronomy community. The front-end of this visual computing infrastructure uses the web technologies WebGL and HTML5 to enable cross-platform, web-based functionality. Currently in beta-release. IEEE LDAV 2012 Best Paper Runner-Up.

<http://astro.cs.pitt.edu/beta>

Hierarchical Spine Tracking: a project for automatically, accurately and reliably determining the 3D motion of the cervical spine from a series of stereo or biplane radiographic images. The software has led to a reduction in labor-time by a factor of 12; the project has been deployed at the UPMC Biodynamics Lab. Patent filed.

Distance-field Computed-Tomography Registration: a project for accurately tracking 3D motion of orthopaedic data from sequences of CT volumes. Accuracy improvements of over 74% compared to the previous state of the art. Project deployed at Brown University.

Research Grants and Awards

“NIH R01 Incorporating Image-based Features into Biomedical Document Classification”, NIH-NLM-R01LM012527, PI on M-PI grant with U Delaware (subcontract from U Delaware, PI H. Shatkay), TBD \$K out of \$1.85M award, Sep 2017 – Aug 2021.

“NIH R01 QuBBD: Precision E –Radiomics for Dynamic Big Head & Neck Cancer Data”, NIH-NCI-R01CA225190, Lead PI on interdisciplinary multi-site project with U Texas, U Iowa, and UMN, \$782K, Sept 2017 – Aug 2020. (Routed to NIH from NSF for funding, Highly Competitive)

“NIH R01 SMART-ACT: Spatial Methodologic Approaches for Risk Assessment and Therapeutic Adaptation in Cancer Treatment”, NIH-NCI-R01CA214825, Lead PI on interdisciplinary multi-site project with U Texas, U Iowa, and UMN, \$1.12M, Mar 2017 – Mar 2020.

“NSF MRI-Development of Continuum: A Virtualized Attentive Environment for Amplified Collaboration”, NSF CNS-1625941, Co-PI, (PI: A. Johnson, other Co-PIs M. Brown, A. Forbes, R. Kenyon, B. Di Eugenio), \$550K, Sept 2016 – Sept 2020.

“UIC Collaborative Dashboard for Patient Care Transitions”, UIC College of Engineering Seed, PI (other co-PIs T. Kannampallil, J. Abraham, UIC School of Medicine), \$25K, May 2016 – Apr 2017.

“NSF DMS QUBBD: Collaborative Research: SMART -- Spatial-Nonspatial Multidimensional Adaptive Radiotherapy Treatment”, NSF-DMS-1557559, PI, other Co-PIs: CD Fuller (MD Anderson Cancer Center), G. Canahuate (U. Iowa), D. Vock (U. Minnesota), \$100K (*\$25K award to UIC*), Sept 2015 – Sept 2016.

“NSF CAREER Data-driven Bottom-Up Humanoid Articulations”, NSF CAREER IIS-1541277, PI, \$280K transfer to UIC, Oct 2014 - Apr 2017.

“NSF CDS&E: Data Management and Visualization in Petascale Turbulent Combustion Simulation”, NSF CBET-1250171, Co-PI (P. Givi PI; other co-Pis L. Yilmaz, A. Labrinidis, P. Chrysanthis), \$500K (*\$352K direct; PI on subcontract to UIC*), Sept 2012 – August 2016.

“NSF CDI-Type II: Understanding the Universe through Scalable Navigation of a Galaxy of Annotations”, NSF OIA-1028162, Co-PI (A. Labrinidis, PI; other Co-Pis P. Chrysanthis, J. Newman, M. Wood-Vasey), \$1.6M (*\$1.1M direct*), Sept 2010 – Sept 2015.

“NSF CAREER: Data-Driven Bottom-Up Humanoid Articulations”, NSF CAREER Award IIS-0952720, PI, \$546K (*\$385K direct*), April 2010 – March 2015.

“Geriatric Research in Ambulatory and Cognitive Excellence (GRACE)”, University of Pittsburgh Research Council’s Multidisciplinary Small Grant Program, Co-PI (C. Rosano PI; other co-PI W. Layton), \$150K (*\$150K direct*), July 2009 – June 2012.

“Immersive Software Engineering”, Pitt Provost’s Advisory Council on Instructional Excellence (ACIE) Innovation in Education grant, PI, \$16K (*\$16K direct*), May 2009 – April 2010.

Funded Research Experiences for Undergraduates (REU) and Workshops

“Visualizing Social Services in Englewood”, PI, Feinberg Foundation, \$16K, May 2017- May 2018

“NSF WORKSHOP: Doctoral Colloquium at IEEE VIS 2016”, NSF-IIS- 1647803, PI, \$20.8K (*\$20.8K direct*), July 2016—June 2017.

“CRA CREU-W Collaborative Research Experience for Undergraduates”, Computing Research Association, \$10.5K, Sept 2015—Apr 2016.

“NSF WORKSHOP: Doctoral Colloquium at IEEE VIS 2015”, NSF IIS-1540159, PI, \$20.8K (*\$20.8K direct*), Apr 2015—Apr 2016.

“NSF REU – CAREER: Data-Driven Bottom-Up Humanoid Articulations”, NSF IIS-1340866, PI, \$12.8K (*\$12.8K direct*), April 2013—May 2014.

“NSF REU – CAREER: Data-Driven Bottom-Up Humanoid Articulations”, NSF IIS-1241554, PI, \$16K (*\$13K direct*), May 2012—May 2013.

“NSF WORKSHOP: Doctoral Colloquium at IEEE VisWeek 2011”, NSF IIS-1139350, Co-PI (R. Kosara, PI; other co-Pis E. Zhang, T.J. Jankun-Kelly), \$20K (*\$20K direct*), Aug 2011—Aug 2012.

“NSF REU – CAREER: Data-Driven Bottom-Up Humanoid Articulations”, NSF IIS-1130458, PI, \$16K (*\$13K direct*), Apr 2011—Apr 2012.

Outreach

2015- Multiple outreach demonstrations of EVL technology to K-12, college students and their families, to date to state, city and administration officials

Faculty research mentor to more than 15 UIC undergraduates, 60% of whom are CS minorities, 2015-2017

Founder and organizer of a mentoring network for female researchers in visualization, Oct 2015

GHC co-chaperone to a cohort of 40 UIC CS female undergrads, Oct 2015

CRA-W REU faculty mentor to three minority students, Sep -May 2016

2013 Organized and ran a Hands-On-Science Animation Bootcamp workshop for 20 under-represented and under-privileged high-school students; excellent reviews, May

2012 Organized and ran the Pitt Women in Computer Science “Mentoring Lunch”, 14 participants (20% participation rate), Oct

Co-Organized the “Lunch with the Industry and National Labs” event at IEEE VisWeek’12, 100 participants, Oct

Co-organized and ran the “Lunch with the Mentors” event at IEEE VisWeek’12, 100 participants, Oct

- Scientific Visualization outreach presentation (w/ VisLab), Pittsburgh Academy for Science and Technology, 100 participants, Jan
- 2011 Created and organized the “Lunch with the Mentors” mentoring system at IEEE VisWeek’11, 150 participants, Oct
- 2010 Created, organized and ran the Technology Leadership Initiative VideoGame Design and Implementation workshop (w/ VisLab) for 18 under-represented and under-privileged elementary school students; excellent reviews, Feb
- Created, organized and ran the Tech Divaz Build a Computer workshop (w/ Women in Computer Science) for the Technology Leadership Initiative; 18 participants, excellent reviews, June
- 2009 Worked with the Technology Leadership Initiative organizer, T. Groover, to revise a Google RISE small grant proposal to support a diversity summer camp, March; awarded (\$5K).
- Visualization and Computational Modeling for Science and Engineering presentation, Technology Leadership Initiative, 25 participants, May
- 2008 Visualization and Computational Modeling for Science and Engineering presentation, Technology Leadership Initiative (Pitt CS Diversity program, reaching to under-represented African-American elementary and highschool students), 25 participants, May
- 2005 Women in Computer Science coordinator, Brown University; launched and coordinated the
– 2007 graduate student arm of the organization, 20 graduate members, Feb

Popular Press Recognition

“Students Honored in the VAST Challenge”, M. Brown, UIC News, Oct 2017

<https://today.uic.edu/files/2017/10/10-04-17-newscenter.pdf>

“Data Visualization & Exploration Tools” Bio-IT World 2017 podcast, Jan 2017

<https://soundcloud.com/chi-podcasts/bit-pod-marai/s-nNPPn>

“Cavern Halos” project image selected for the Computing Research Association Newsletter and call for collaborative REU proposals, Apr 2017

“Students honored in VAST Challenge”, M. Brown, UIC News newspaper, Oct 4th 2017

<https://today.uic.edu/files/2017/10/10-04-17-newscenter.pdf>

“Tensor Descriptors” project images selected for the cover of the Journal of Imaging Science and Technology, Vol. 60, 2016

CS Degree Hub’s “The 50 Most Innovative Computer Science Departments in the U.S.” (for my group’s work in biology visualization while at Pitt), Y. Laher, December 2014.

<http://www.computersciencedegreehub.com/50-innovative-computer-science-departments/>

“VisWeek 2011: New Compass Activities for New Researchers”, A. Tarbox, Conduit Vol. 21(1), May 2012

“Pitt scientists get grant to catalog space data”, D. Erdley, Pittsburgh Tribune-Review, July 2011

“Pitt Researchers Tackle Flood of Space Data With \$1.6 Million Project”, M.Kelly, University of Pittsburgh University Times, May 2011

“Comp sci adds another CAREER award”, University of Pittsburgh University Times, Apr 2010

“Rethinking Computer Science education”, M. Lane-Ogden, University of Pittsburgh Teaching Times, Sept 2009

“Making moves: Pitt experiment tracks body shifts”, M. Cronin, Pittsburgh Tribune-Review, March 2009

“Transformational Research through Modeling and Simulation: Pitt Researchers Tackle Some of the Most Complex Issues of Our Times in New Center”, R. Frazier, Pitt Center for Simulation and Modeling Inaugural Brochure, October 2008

“CS224 Final Projects Win @ ACM SIGGRAPH ‘04”, S. Howe, Conduit Vol 13(1), Aug 2004

Invited Presentations

2017

University of Oregon, Eugene, Feb 2017

“Distinguished Math Lecture for Undergraduates: Computer Graphics for Science”

ISMB Great Lakes Bio, Chicago, May 2017

“Tutorial: Introduction to Biology Visualization”

ISMB Great Lakes Bio, Chicago, May 2017

“Biology Visualization at the Electronic Visualization Lab”, w/ A. Forbes

Bio-IT World, Boston, May 2017

“Big Display Visualization of Bioinformatics Data”

National Institutes of Health, Bioinformatics and Computational Biosciences Branch NIAID, June 2017

“Big Display Data Visualization at the Electronic Visualization Lab”

U Chicago BioJam, Chicago, Sep 2017

“Visual Computing at the Electronic Visualization Laboratory”

IEEE VIS 2017, Phoenix AZ, Oct 2017

“AVID: Advancing Visualization Inclusion and Diversity” Panel

- IEEE VIS 2017, Phoenix AZ, Oct 2017
 “Bridging the Divide: Lessons from the Trenches of Interdisciplinary and Applied Visualization Research”, VizSec Panel
- IEEE VIS 2017, Phoenix AZ, Oct 2017
 “Activity-Centered Domain Characterization”, SciVis’17
- 2016 Dagstuhl Multi-Valued Symposium, Germany, Apr 2016
 “Spatial-Nonspatial Integration in Engineering”
- IEEE Virtual Reality Workshop on Immersive Analytics, Greenville SC, Mar 2016
 “Immersive Analytics at the Electronic Visualization Lab”
- Visual Data Analysis 2016, San Francisco CA, Feb 2016
 “Visual Descriptors for Dense Tensor Fields in Computational Turbulent Combustion”
- Electronic Imaging 2016, San Francisco CA, Feb 2016
 “Cavern Halos: Exploring Spatial and Nonspatial Cosmological Data in an Immersive Virtual Environment”
- 2015 DePaul University, Dept of Computer Science, Chicago IL, Oct 2015
 “Geometric Modeling and Visualization for Science”
- University of Houston, Dept of Computer Science, Houston TX, Oct 2015
 “Geometric Modeling and Visualization for Science”
- Grace Hopper Conference, Houston TX, Oct 2015
 “UIC BRAID: aiming for 30%”, panel
- NSF/NIH SAMSI Workshop (20% acceptance), Raleigh, NC, July
 “SAMSI DMS Project: SMART”
- BioVis’15, Dublin, Ireland, July
 “BioVis’15 Awards Ceremony and Closing Remarks”
- EuroVA, Sardinia, Italy, May
 “Visual Scaffolding in Integrated Spatial and Nonspatial Visual Analysis”
- UIC Bioengineering Seminar, Feb
 “Geometric Modeling and Visualization for Science”
- 2014 Dagstuhl Scientific Visualization Seminar, Germany, June
- ...
- Dagstuhl Tensor Visualization Symposium, Germany, Feb
- University of Maryland Baltimore County, Department of Information Systems, Jan

- University of Maryland College Park, Department of Computer Science, Jan
- 2013 Virginia Tech, Department of Computer Science, Nov
- IEEE VIS SciVis 2013, Atlanta, GA, Oct
- ATR Institute, Robotics Seminar, Nara, Japan, Sept
- MICCAI MedMesh 2013, Nagoya, Japan, Sept
- EuroGraphics VMV 2013, Lugano, Switzerland, Sept
- New York University Poly, Department of Computer Science, May
- Tufts University, Department of Computer Science, March
- 2012 University of Pittsburgh, Department of Biomedical Informatics, Oct
- University of Maryland, Baltimore County, Oct
- Pittsburgh Academy for Science and Technology (w/ VisLab), Pittsburgh PA, Jan
- CHIA Dataverse Colloquium (w/ cs1630 students), Pittsburgh PA, Mar
- 2011 Dagstuhl Tensor Symposium, Germany, Dec (prestigious, invitation-only CS workshop sponsored by the German federal government)
- IEEE VisWeek 2011, Providence, RI, Oct
- AEGIS Colloquium (w/ students T. Luciani and R. Hachey), Pittsburgh PA, July
- 2010 Carnegie-Mellon Bioimaging Day, Pittsburgh PA, March
- Tech Divaz camp, Technology Leadership Initiative, Pittsburgh PA, June
- Diversity Workshop (w/ VisLab), Technology Leadership Initiative, Pittsburgh PA, Feb
- 2009 Georgia Tech & Carnegie-Mellon University Graphics Retreat, Pittsburgh PA, Nov
- BMES 2009, Pittsburgh PA, Oct
- University of Minnesota, Computer Science, Graphics Group Seminar, Sept
- EMBC 2009, Minneapolis MN, Sept
- ACM SIGGRAPH Talks, New Orleans LA, August
- Dagstuhl Tensor Symposium, Germany, July (prestigious, invitation-only CS workshop sponsored by the German federal government)

Eurographics/IEEE Symposium on Visualization, Berlin, Germany, June

University of Pittsburgh, Center for Simulation and Modeling, January

Carnegie Mellon University, Graphics Group Seminar, March

2008 San Francisco University, Pre-Orthopaedic Research Society Symposium, March

University of Pittsburgh – Carnegie Mellon University, Bioengineering and Bioinformatics Summer Institute, June

Pitt CS Technology Leadership Initiative, July

University of Pittsburgh – Carnegie Mellon University, Computational Biology Program, November

2007 Carnegie Mellon University, Robotics Institute Faculty Lunch Meeting, November

University of New Hampshire, Computer Science, April

Professional Service

2018 Co-Chair, EuroVis'18 STAR (State of the Art Reports)

Program Committee, Electronic Imaging Visual Data Analysis 2018

Steering Committee, BioVis

Co-organizer (w/ K. Nieselt, N. Gehlenborg, J. Aerts) Dagstuhl seminar on BioVis

Co-editor Special Issue on Immersive Analytics, Frontiers in Robotics and AI

2017 Steering Committee, BioVis

Program Committee, EuroVis 2017 STAR

Program Committee, Electronic Imaging Visual Data Analysis 2017

External reviewer IEEE VIS SciVis, IEEE VIS VAST, IEEE VIS InfoVis

IEEE TVCG reviewer

NIH Panelist

Bio-IT World 2017 session chair

ISMB Great Lakes Bio 2017 session co-organizer (w/ A. Forbes)

2016 Conference General Co-Chair, BioVis 2016

EuroVis 2016 Program Committee

EuroVis 2016 Short Papers Program Committee

IEEE Virtual Reality 2016 Workshop on Immersive Analytics, Co-organizer and Co-Chair

SuperComputing 2016 Visualization Showcase Program Committee

IEEE VIS 2016 Organizing Committee, Doctoral Colloquium Co-Chair

External IEEE VIS reviewer (SciVis, VAST)

NSF Panelist x 3 times

2015 Doctoral Colloquium Co-Chair and Organizing Committee, IEEE VIS 2015

Short Papers Program Committee, EuroVis 2015

Program Committee, EuroVis 2015

Conference General Co-Chair, BioVis 2015

Keynote Session Chair, BioVis 2015

External paper reviewer, IEEE VIS SciVis 2015, IEEE VIS InfoVis 2015, IEEE VIS VAST 2015

NSF Panelist

2014 Program Co-Chair, BioVis 2014

Associate Editor, BMC Bioinformatics

SciVis Publicity Chair, Organizing Committee, IEEE VIS 2014

Program Committee, IEEE VIS 2014

Program Committee, EuroVis 2014

Program Committee, CompImage 2014

- Program Committee, IADIS International Conference on Computer Graphics, Visualization, Computer Vision and Image Processing
- 2013 Program Co-Chair, IEEE BioVis 2013
- Program Committee, IEEE SciVis 2013
- Papers Session Chair, IEEE SciVis 2013
- Program Committee and Organizing Committee, IEEE BioVis 2013
- Program Committee, MICCAI Workshop on Mesh Processing
- Program Committee, IADIS International Conference on Computer Graphics, Visualization, Computer Vision and Image Processing
- Paper reviewing for IEEE TVCG, IEEE Vis, IEEE InfoVis, EuroVis
- NSF Panelist
- NSF Panel Ad-hoc Reviewer (external)
- Scholarship Application Committee, Grace Hopper Celebration of Women in Computing Conference 2013
- 2012 Guest-Editor, IEEE Computer Graphics and Applications, Special Issue, Biomedical Applications: From Data Capture to Modeling
- Program Committee and Organizing Committee, IEEE SciVis (Vis) 2012
- Papers Session Chair, IEEE SciVis (Vis) 2012
- Chair, Compass Committee (see 2011) IEEE VisWeek 2012
- Organizing Committee, IEEE BioVis 2012
- Co-Chair, Industry Committee IEEE BioVis 2012
- Program Committee, IADIS International Conference on Computer Graphics, Visualization, Computer Vision and Image Processing
- Program Committee, MICCAI Workshop on Mesh Processing
- Scholarship Application Committee, Grace Hopper Celebration of Women in Computing Conference
- Paper reviewing for IEEE TVCG, IEEE Vis, IEEE InfoVis, EuroVis, IEEE Computer Graphics and Applications, PacificVis
- 2011 Co-Chair, Doctoral Colloquium, IEEE VisWeek 2011; co-run the Doctoral Colloquium Workshop

Organizing Committee, IEEE VisWeek 2011; beside O.C. duties, created and organized the Compass activities, a highly successful set of networking events for visualization researchers and practitioners.

Panel Organizer, IEEE VisWeek 2011

NSF Graphics & Visualization Panel

Paper reviewing for IEEE Vis

2010 NSF Graphics & Visualization Panel

ACM SIGGRAPH Bioengineering Jury

Paper reviewing for Journal of Biomechanics, IEEE Vis

Scholarship Application Committee, Grace Hopper Celebration of Women in Computing

2009 Paper reviewing for IEEE Vis, IEEE Trans. Biomedical Engineering

Scholarship Application Committee, Grace Hopper Celebration of Women in Computing

2008 Paper reviewing for ACM SIGGRAPH, Journal of Biomechanics

External proposal reviewing for NSF

Scholarship Application Committee, Grace Hopper Celebration of Women in Computing

2007 Scholarship Application Committee, Grace Hopper Celebration of Women in Computing

Paper reviewing for IEEE Trans. On Medical Imaging, IEEE Trans. On Visualization and Computer Graphics, ACM SIGGRAPH, Journal of Biomechanics

pre-2007 Paper reviewing for IEEE Trans. On Medical Imaging, IEEE Trans. On Visualization and Computer Graphics, ACM SIGGRAPH (Sketches and Posters), Journal of Biomechanics

ACM International Programming Competition'97, S-E European Regional Organizing Committee

Teaching and Research Advising

Honors to my students (for work done together)

IEEE VIS 2017 Doctoral Colloquium selection to T. Luciani

IEEE VAST Challenge 2017 Honorable Mention MC2 to J. Castor, J. Borowicz, A. Burks, M. Thomas, T. Luciani

IEEE VAST Challenge 2017 Honorable Mention MC3 to V. Mahida, B. Kupiec, A. Burks, T. Luciani

IEEE VGTC VPG 2016 Outstanding Award to my cs526 students

Tapia 2016 Fellowship to B. Habtegiorgis

Tapia 2016 Fellowship to C. Uribe
 UIC CS Scholars' Fellowship to J. Tapia
 IEEE VIS 2016 Doctoral Colloquium selection to C. Ma
 Computing Research Association research fellowship to B. Habtegiorgis, J. Rodriguez, C. Uribe
 IEEE VIS 2013 Doctoral Colloquium selection to Md.A. Haque
 NSF Graduate Research Fellowship to T. Luciani
 BioVis Contest Outstanding Paper award to J. Wenskovitch, T. Luciani
 LDAV Outstanding Paper award to T. Luciani, S. Myers
 BioVis Outstanding Paper award to A. Smith, W. Xu

Current Graduate Advisees

Timothy Luciani (doctoral, second year at UIC, NSF Graduate Research Fellow)
 Chihua Ma (doctoral, 5th year) RA, co-advised w/ Bob Kenyon
 Juan Trabucco Trelles (doctoral 1st year), CS, RA
 Peter Hanula (masters), CS, RA
 Manu Thomas (masters), CS, RA

Ph.D. Graduates Abed Haque, 2014 (Mathworks)

M.Sc. Graduates At UIC:
 Juan Trabucco Trelles (UIC PhD program)
 Ashwin Venkatamaran (Amazon)
 Filippo Pellolio (HERE)
 Davide Tantillo (n/a)
 Andrea Rottigni (HylaSoft)

 At Pitt:
 John Wenskovitch, 2014 (Virginia Tech & Allegheny College)
 Sean Myers, 2014 (Amazon)
 Adrian Maries, 2013 (Harvard, research staff)
 Rebecca Hachey, 2013 (Pitt Learning Research and Development Center)
 Adam Smith, 2012 (GDVis)
 Wen Xu, 2011 (Microsoft)

B.Sc. Graduates At UIC:
 (thesis/project)

 Joshua Rodriguez 2015 (Lockheed Martin)
 Revanth Reddy 2016 (UIUC)
 Peter Hanula 2016 (UIC grad program)
 Brook Habtegiorgis 2016 (Oracle)
 Carlos Uribe 2016 (Chase)
 Kamil Piekutkowski 2016 (Cummins Allison)
 Evan Kreft 2017

 At Pitt:
 Mary Letera 2014 (Philips)
 Zach Sadler 2014 (Adknowledge)
 Sean Myers 2013 (Pitt CS grad program)
 Tim Luciani 2011 (**NSF Graduate Research Fellowship**, UIC CS)

Daniel Oliphant 2010 (Google)
 Victor Powell 2010 (YinzCam)
 Matthew Seiler 2010 (Bechtel Corporation)
 Matthew Czarnek 2010 (Czarnek and Orkin Labs)
 Stephen Lauck 2009 (Force and Form)
 John Conomikes 2008 (CMU Entertainment Technology Center)

Graduate Research Advising

| | |
|----------------------|--|
| 2016 - 2017 | Timothy Luciani (doctoral, 5 th year), CS, NSF GRF Chihua Ma (doctoral, 5 th year), CS, RA, co-advised w/ Bob Kenyon Manu Thomas (masters), CS, RA Juan Trabucco Trelles (masters), CS, RA Peter Hanula (masters), CS, RA Mat Monford (doctoral), CS, RA w/ Brian Ziebart Sneha Tuteja (masters), CS, RA |
| 2015 – 2016, at UIC | Timothy Luciani (doctoral, 4 th year), CS, NSF GRF Chihua Ma (doctoral, 4 th year), CS, RA, co-advised w/ Bob Kenyon Filippo Pellolio (masters), CS, RA Davide Tantillo (masters), CS, RA w/ Andy Johnson Andrea Rottigni (masters), CS, RA w/ Andy Johnson Shiwangi Singh (masters), CS, TA Ashwin Venkatamaran (masters), CS, RA |
| 2013 – 2014, at Pitt | Abed Haque (doctoral, 6 th year), Tim Luciani (doctoral, 2 nd year), John Wenskovitch (doctoral, 3 rd year), Sean Myers (masters) |
| 2012 – 2013 | Abed Haque (doctoral, 5 th year), Adrian Maries (medical transfer to MSc program), Tim Luciani (doctoral, 2 nd year), John Wenskovitch (doctoral, 2 nd year), Sean Myers (masters) Directed study: Xiaoming Fan (doctoral 1 st year), Koonwah Chen (SIS masters) |
| 2011 – 2012 | Abed Haque (doctoral, 4 th year), Adrian Maries (doctoral, 4 th year), Adam Smith (masters), Tim Luciani (doctoral, 1 st year), Rebecca Hachey (masters) Directed study: John Wenskovitch (doctoral, 1 st year, co-advised) |
| 2010 – 2011 | Abed Haque (doctoral, 3 rd year), Adrian Maries (doctoral, 3 rd year), Adam Smith (masters), Wen Xu (masters) Directed study: Callen Shaw (masters), Andrew Conn (masters) |
| 2009 – 2010 | Abed Haque (doctoral, 2 nd year), Adrian Maries (doctoral, 2 nd year), Yao Sun (doctoral, 2 nd year; <i>masters 2012, Amazon</i>), Wen Xu (masters) |

2008 – 2009 Abed Haque (doctoral, 1st year), Sriranjani Mandayam (doctoral, 1st year, *masters 2010 School of Information Sciences*), Yao Sun (doctoral, 1st year)
Directed study: Wenting Xiong, David Krebs, Adrian Maries

2007 – 2008 Yinglin Sun (doctoral, 2nd year, *masters 2011, N/A*)
Directed study: Michael Lipschultz

Pre-2007 Directed study: Peter Sibley (Brown University), Phil Montgomery (Brown University)

Undergraduate Research Advising

2017-2018 Andrew Burks (senior, private donor)
Isabel Lindmae (junior, private donor)
Dimitar Kirilov (junior, NSF, w/ Dan Sandin)
Bart Kupiec (junior, NSF, w/ Dan Sandin)
Joshua Castor (junior, startup)
Joe Borowicz (junior, NSF, w/ Barbara di Eugenio and Andy Johnson)
Vijayraj Mahida (junior, NSF, w/ Barbara di Eugenio and Andy Johnson)

(total: 7 REUs, one female)

2016-2017 Michal Bochnak (sophomore, Honors College)
Andrew Burks (junior, NSF REU)
Jacqueline Tapia (sophomore, NSF REU)
Dennis McNamara (junior, NSF REU)
Cassiano Sugiyama (senior, Brazilian Mobility Program)
Tyrone Harris (junior, NSF REU)

(total: five REUs, two Hispanic, one African American)

2015-2016, at Joshua Rodriguez (senior, NSF REU, co-advised w/ Lance Long, EVL)
UIC Carlos Uribe (senior, startup)
Kamil Piekutowski (senior, NSF REU)
Brook Habtegiorgis (junior, NSF REU)
Evan Kreft (senior, NSF REU)
Peter Hanula (senior, NSF REU)
Revanth Reddy (senior)
Nabeelah Khan (junior)

(total: six NSF REUs, two Hispanic, one African American)

2013 -- 2014 Mary Letera, Tyler Raborn

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| 2012 – 2013 | Sean Myers, Zach Sadler |
| 2011 – 2012 | Tim Luciani, Daniel Walker, Jordan Sawyer, Sean Myers, Ben Steele |
| 2010 – 2011 | Daniel Oliphant, Victor Powell |
| 2009 – 2010 | Daniel Oliphant, Matthew Seiller |
| 2008 – 2009 | Stephen Lauck, Victor Powell, Jackie Kircher |
| 2007 – 2008 | Matthew Czarnek, John Conomikes |
| Pre-2007 | Ethan Bromberg (Brown University), Arni Jonsson (Brown University) |

Examiner/Reader (Comprehensive Examinations, Thesis Committees)

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| 2016- 2017 | Tim Luciani (PhD Proposal), July 2017 Contextual Similarity Abstraction Techniques for Spatial Data Analysis |
| | Chihua Ma (PhD Proposal), June 2016 Visual Analysis Techniques for Spatial-Nonspatial, Dynamic, Multi-Scale and Multi-Run Biological Networks |
| | Manuel Tanzi (MS Defense), Dec 2016 Visualization of Neurophysiological Dynamic Communities within the Mouse Brain |
| | Yiji Zhang (WCP), March 2017 Automatically Localizing Faults in Software Applications |
| | Juan Trabucco Trelles (MS Defense), March 2017 CAVE2 comparison of 1st & 3rd user perspectives in virtual motor rehabilitation tasks |
| | Mohammad Taha Khan (WCP), March 2017 Packets Lost in the Wild: An Analysis of Empirical Approaches to Measure Internet Censorship |
| 2015- 2016, at UIC | Filippo Pellolio (MS Defense), Apr 2016 SAGEBoard: a Whiteboard for Large Multitouch Displays |
| | Andrea Rottigni (MS Defense), Apr 2016 Serious Games for Virtual Rehabilitation in a Large Scale Virtual Reality Environment |

- Davide Tantillo (MS Defense), Apr 2016
Large Multi-Touch Vertical Displays in Multi-User Competitive Tasks
- Tim Luciani (WCP), Apr 2016
Spatial and Non-Spatial Visualizations in Computational Biology
- Jillian Aurisano (WCP), Apr 2016
Supporting sensemaking in visual data analysis
- Lei Zheng (WCP), Mar 2016
Deep Learning for Recommender Systems
- Matteo Palvarini (MSc), Dec 2015
RoomCast: an Authoring Environment and Runtime System for Classroom
Orchestration of Digital Resources
- Tomas Gerlich (PhD Proposal)
Multi-Motion Segmentation and Epi-Flow Estimation with a Static Camera
- Shreya Gosh (WCP)
Analyzing Importance of Node Based on Node Deletion and Node Contraction
- Darya Filippova (CMU, PhD Defense), July 2015
Algorithms for identification, visualization, and compression of prominent
substructures in biological data
- 2013 – 2014 Xiang Xiao, Qinglan Li, Adrian Maries, Abed Haque, Sean Myers, Tim Luciani,
Darya Fillipova (CMU)
- 2012 – 2013 Becca Hachey, Patrick Dudas, Yingze Wang, Eric Heim
- 2011 – 2012 Abed Haque, Michal Valko, Roxana Gheorghiu, Yingze Wang, Iyad Batal
- 2010 – 2011 Wen Xu, Abed Haque, Adrian Maries, Mike Lipschultz, Michal Valko, Roxana
Gheorghiu
- 2009 – 2010 Ricardo Villamarin
- 2008 – 2009 Michal Valko, Ricardo Villamarin, Tomas Singliar
- 2007 – 2008 Tomas Singliar, Qinglan Li

Courses Taught at UIC

CS527 Computer Animation (2017F)

CS342 Software Design (2017S)

CS526 CG II: Scientific Visualization (2016F)

CS426 Videogame Design (2016S, 2017S, 2017F)

CS422 User Interface Design and Programming (2015S)

CS522 Human Computer Interaction (2015F)

- 2017 Spr CS342 “Software Design” (required course)
 Enrollment: 70 after add/drop period (69 retained)
 Evaluations: 4.05/5 (65 responses out of 66)
 Redesigned the syllabus from scratch, to accommodate an active learning style that keeps students engaged despite little prior exposure to Java, and to allow a heavier emphasis on the software design process. The redesigned course emphasizes similarities between Java and C++, requirements analysis, functional specs, object-oriented design principles, collaborative tools, usability testing, teamwork, project management, and communication in the workplace, “soft skills” to make our undergraduates more competitive on the job market.
- 2017 Spr CS426 “Videogame Design”
 Enrollment: Class full with 48 students enrolled (40 retained).
 Evaluations: 3.5/5 (37 responses out of 40)
 Class bursting at the seams w/ CS undergrad enrollment (no room for Artists, only two grad students). 13 final projects, including one serious game on anesthesiology training.
- 2016 Fall CS526 Scientific Visualization.
 Small seminar class with 9 students enrolled (9 retained).
 Evaluations: 4.67/5 (9 responses out of 9)
 Seminar covering the nuts and bolts of scientific visualization. 8 final projects with external “clients (domain scientists on and off campus). IEEE VGTC VPG Outstanding Award to the entire class for a three-week project analyzing the seasonal distribution and usage of student test centers across the US. Students and instructor honored at the VPG reception at IEEE VIS 2016.
- 2016 Spr CS426 Videogame Design.
 Class full with 50 students enrolled (31 retained).
 Evaluations: 3.73/5 (31 responses out of 31)
 Interdisciplinary course with emphasis on teamwork. Content extended to accommodate the enrollment of UIC Art and Design undergraduate students. Initiated collaboration with UIC English majors interested in creating media content for videogames. 10 final projects, including one serious game on physical rehabilitation.

- 2015 CS522 Human Computer Interaction.
Class full with 35 students enrolled (30 retained).
Evaluations: F.A.-voided due to large, reprimanded cheating incident among MS students.
Redesigned the syllabus, assignments, projects and exams to encourage interdisciplinary collaboration, teamwork, and service to the campus. 15 successful final projects with campus clients.
- 2015 CS422 User Interface Design and Programming.
Class full with 45 students enrolled.
Evaluations: 4.42/5 grad section, 4.13/5 undergrad section (40 responses out of 42)
Enrollment: 45 enrolled, 42 retained (14/15 grad, 28/30 undergrad).
Redesigned the syllabus, assignments, projects and exams to encourage interdisciplinary collaboration, teamwork, and service to the campus. 15 successful final projects with campus clients.

Courses Taught at U of Pittsburgh

CS2620 Interdisciplinary Modeling and Visualization (2009, 2011, 2012, 2014)
CS1566 Introduction to Computer Graphics (2008, 2009, 2010, 2011, 2012, 2013)
CS3610 Special Topics in Computer Graphics (2008, 2010, 2013)
CS1699 Special Topics in CS: Software Engineering and Project Management (2010)
CS1666 Principles of Videogame Design and Implementation (2011, 2013, 2014)
CS1630 Software System Design and Management (2012)

- 2013 – 2014 CS1666 Principles of Videogame Design and Implementation. Content further extended to accommodate English majors interested in creating content for videogames. The students worked in interdisciplinary teams.
- CS1566 Introduction to Computer Graphics. Class full with 48 students enrolled. Class format modified to allow in-class student skits on Computer Graphics select topics. Content further extended to include GPU programming.
- CS2620 Interdisciplinary Modeling and Visualization. Class full with 18 students enrolled.
- 2012 – 2013 CS3610 Advanced Topics in Computer Graphics. Seminar-level course in Visualization, class full with 17 graduate students enrolled and one auditing. One final project leads to an IEEE BioVis 2013 Data Contest Visualization Award in Oct 2013. Pitt CS **Teaching Award Nomination**.
- CS1666 Principles of Videogame Design and Implementation. Content further extended to accommodate usage of the Unity game engine, and the enrollment of undergraduate students interested in creating Visual Art for videogames. Continued collaboration with English majors interested in creating media content for videogames.

CS1566 Introduction to Computer Graphics. Content further extended to accommodate a virtual camera programming assignment. Outstanding final projects. Highest OMET scores and evaluations since class first taught.

- 2011 – 2012 CS2620 Interdisciplinary Modeling and Visualization. One of the final interdisciplinary projects makes the shortlist in the [Desire2Learn Edge Challenge](#) (\$25K industry competition challenging developers to build apps that improve the experience of teachers, students and administrators), and another one grows into a system demonstration at IEEE Visualization 2012. Pitt CS **Teaching Award**.

CS1630 Immersive Software-System Design and Management. Two large scale software projects resulted from this edition of the course: a prototype system for mining history, disease and climate data (commissioned by the Pitt History Department, successfully demonstrated at the CHIA Dataverse Colloquium'12), and an automated homework submission and grading system for the Pitt Academy of Science and Technology (product described as “perfect” by the commissioner.)

CS1566 Introduction to Computer Graphics. Content further extended to accommodate a ray-tracing programming assignment. For the first time ever, Pitt students were able to complete a simple *ray-tracer* (cornerstone of computer graphics education, featuring complex math and programming) as part of their coursework.

- 2010 – 2011 CS2620 Interdisciplinary Modeling and Visualization. Four short papers and system demonstrations resulting from interdisciplinary projects in this class were accepted into IEEE VisWeek 2011.

CS1666 Principles of Videogame Design and Implementation. I redesigned this course from scratch to emphasize the cross-disciplinarity of videogame design (artistic design, creative writing, and computer science). Pitt CS **Teaching Award**.

CS1566 Introduction to Computer Graphics. Updated the course with a speaking component: 5-minute student-pitches each class. Excellent final projects, followed by increased enrollment in the Videogame course CS1666.

- 2009 – 2010 CS1699 Immersive Software-System Design and Management. I developed this senior-level undergraduate course on software engineering in accordance with the Pitt Speaking in the Disciplines guidelines. The course emphasizes project management, usability testing, customer interviewing, specification of formal requirements, and oral communication, “soft skills” which will make our graduates more competitive in the global marketplace and less susceptible to off-shoring. Pitt CS **Teaching Award, top 4% courses in the School of A&S**.

CS1566 Introduction to Computer Graphics. Course content further extended to accommodate a ray-object intersections math and programming assignment. For the first time ever, Pitt students were able to compute ray-object intersections (complex math, and building block towards ray-tracing). Impressive gallery of final projects.

CS3610 Advanced Topics in Computer Graphics. I taught a new edition of the course, with emphasis on Visual Analytics and Human-Computer Interaction. The course follows the Pitt Speaking in the Disciplines guidelines to help students develop their oral communication skills. Student feedback indicates success.

2008 – 2009 CS2620 Interdisciplinary Modeling and Visualization. I developed and taught this graduate course for the first time in this lecture/assignments/final project format. The course emulates the process of scientific research, from a peer-reviewed proposal to a final report and presentations. Several projects resulted in publications and/or long-term interdisciplinary collaborations. Pitt CS **Teaching Award, top 4% courses in the School of A&S.**

CS1566 Introduction to Computer Graphics. I updated this undergraduate course to further emphasize modeling and simulation concepts; including a hot-topic GPU programming component. 100% student retention. The final projects were so compelling, I was asked to talk about this course at SIGGRAPH 2009.

2007 – 2008 CS3610 Advanced Topics in Computer Graphics. I developed and taught this graduate course for the first time this year. In it, students learned the basics of scientific modeling and visualization and emulated the process of doing interdisciplinary research by working in multi-disciplinary teams on scientific problems. The groups for each project were required to have participants from multiple disciplines, exposing them to many of the skills required for multi-disciplinary collaborative work. Pitt CS **Teaching Award.**

CS1566 Introduction to Computer Graphics. I gave this undergraduate course a much-needed re-haul. Updates include a completely new syllabus with sections on photorealism, video game design, image processing, color perception, and user interfaces.

Pre-2007 Interactive Computer Graphics (Brown University CS 224, 2004). I co-designed and co-taught the 2004 edition of this research-oriented graduate level class. Full class responsibility, shared with fellow graduate students Morgan McGuire and Tomer Moscovich.

Curriculum Development

At UIC

Proposed cross-listing of CS426 as DES426 (Videogame Design and Implementation); approved 2017.

At Pitt

Created and proposed *Immersive Software System Design and Management* (CS 1630); approved 2010.

Proposed *Immersive Software Engineering*, Provost's ACIE award, 2009

Designed and proposed *Interdisciplinary Modeling and Visualization* (CS 2620); approved 2008.

Co-designed and co-proposed *Principles of Computer Game Design and Implementation* (CS 1666), approved 2007.

University Service at UIC

2017-2018 Campus Research Board

Undergraduate Advising Committee (40 students Fall)

Faculty Search Committee

2016-2017 Undergraduate advising

Graduate Admissions Committee

Undergraduate Committee

Honors College Fellow

Co-hosted Distinguished Lecturer (Sheelagh Carpendale, Calgary U)

2015-2016 Undergraduate advising

Graduate Admissions Committee

Hosted Distinguished Lecturer (Claudio Silva, NYU)

GHC'15 WiCS escort, Oct 2015

UIC Open House EVL demos, Oct 2015

2015 Undergraduate advising

W-ACM Women's Student ACM Chapter, Advisor

Graduate Admissions Committee

Co-Hosted Distinguished Lecturer (Tamara Munzner, UBC)

Organized cs422 undergraduate demos for U of Illinois new president, May 2015

Organized cs422 undergraduate demos for CS Advisory Board, May 2015

Selected, hired and supervised 6 REUs, three of which are minority students

Marshalled CS commencement

University Service at Pitt

2013 – 2014 Women in Computer Science Committee, Co-Chair; diversity advising.

Undergraduate Recruiting and Advising Committee; CS major advising.

Graduate Evaluation, Assignment and Training Committee

Center for Simulation and Modeling (SAM) Advisory Board

2012 - 2013 Women in Computer Science Committee, Co-Chair; bi-monthly events

Undergraduate Recruiting and Advising Committee; besides advising, paired each diversity student advised with mentors from the Women in Computer Science community

Graduate Evaluation, Assignment and Training Committee; recitation and lab visits, evaluation and feedback to the Graduate TAs

Center for Simulation and Modeling (SAM) Advisory Board

2011 - 2012 Women in Computer Science faculty advisor and coordinator; bi-monthly events

Center for Simulation and Modeling (SAM) Advisory Board

Hosted CS “Big Data” Colloquium speakers: James Faeder (Computational Biology), Harry Hochheiser (UPMC Bioinformatics), Peter Brusilovsky (ISP), Jeffrey Newman (Astronomy), Levent Yilmaz (Engineering), Vanathi Gopalakrishnan (UPMC Bioinformatics)

2010 - 2011 Co-Chair, Distinguished Lecture Series; raised Google funding for the series

Chair, CS Colloquium

Women in Computer Science faculty advisor and coordinator; bi-monthly events

Chair, Diversity Committee; helped recruit two Hot Metal Bridge fellowships to the CS department

2009 - 2010 Center for Simulation and Modeling (SAM) Advisory Board

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- 2009 - 2010 Hosted Colloquium speakers: Aaron Henderson (Studio Arts), Jeff Newman (Astronomy), Michael Wood-Vasey (Astronomy), William Anderst (Orthopaedics), Chris Johnson (Utah), Claudia Mello-Thoms (UPMC Bioinformatics)
- Center for Simulation and Modeling (SAM) Advisory Board
- Chair, CS Colloquium; helped recruit Kitware to the Pitt CS Industry Board
- CS Outreach Committee; marketing departmental accomplishments via the CS website, posters, fliers etc.
- CS-Day Committee; organizer Digital Media Contest
- Women in Computer Science (WiCS) faculty-coordinator; regular meetings and outreach activities
- Technology Leadership Initiative Advisory Board; workshop-organizing for under-represented and under-served high-school students
- Hosted CS Colloquium speakers: Marcus Hanwell (Kitware Inc), Morgan McGuire (NVIDIA)
- 2008 - 2009 Center for Simulation and Modeling (SAM) Advisory Board
- CS Colloquium Chair; helped increase corporate support for Distinguished Lecture Series from 0 to 2
- Hosted CS Colloquium speakers: Joseph Konstan (Distinguished Lecturer; U. Minnesota), Fernando DeLaTorre (CMU)
- CS Graduate Admissions and Financial Aid Committee
- CS-Day Committee; co-organizer Digital Media Contest
- CS Outreach (ad hoc) Committee; helped with international recruiting and departmental website redesign
- Women in Computer Science (WiCS) faculty-coordinator; bimonthly meetings including industry guests, and outreach activities
- Hosted seminar-speakers: M. Renieris (Google), M. Friedman (Public Health), M. Hanwell (Chemistry), J. Faeder (Computational Biology), G. Mustata (Drug Discovery Institute), M. Wood-Vassey and J. Newman (Astronomy).
- 2007 - 2008 Center for Simulation and Modeling (SAM) Organizational Committee
- Women in Computer Science (WiCS) Coordinator and founder
- Bioengineering and Bioinformatics Summer Institute (BBSI) Mentor

Hosted seminar-speakers: M. Renieris (Google), S. Tashman (Pitt Medical School Orthopaedics), S. Leuba (Pitt Biophysics), G. Hutchison (Chemistry), J. Faeder (Computational Biology), and N. Ebenreuter (CMU Design)

CS Graduate Admissions and Financial Aid Committee; excellent admissions record

CS Faculty Search Committee

CS-Day Committee; co-organizer Digital Media Contest

CS Outreach (ad hoc) Committee; helped with international recruiting and departmental website redesign

Memberships

ACM, IEEE, ISCB.

Prepared Oct 2017