

JOSEPH J. LAVIOLA JR.
Curriculum Vitae

University of Central Florida
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RESEARCH INTERESTS

User interfaces, interactive 2D and 3D graphics, human robot interaction, pattern recognition

EDUCATION

- 2005:** **Ph.D.**, Computer Science, Brown University
Dissertation: "Mathematical Sketching: A New Approach to Creating and Exploring Dynamic Illustrations"
Advisor: Andries van Dam
- 2001:** **Sc.M.**, Applied Mathematics, Brown University
- 2000:** **Sc.M.**, Computer Science, Brown University
Thesis: "Whole-Hand and Speech Input in Virtual Environments"
- 1996:** **B.S.**, Computer Science, Florida Atlantic University

PROFESSIONAL EXPERIENCE

- 2015-Present:** Director of the Modeling and Simulation Graduate Program, University of Central Florida, Orlando, FL
- 2015-Present:** Charles N. Millican Faculty Fellow and Associate Professor of Computer Science, University of Central Florida, Orlando, FL
- 2014-Present:** Director of the Interactive Computing Experiences Research Cluster of Excellence, University of Central Florida, Orlando, FL
- 2008-Present:** Affiliated Research Faculty, Institute for Simulation and Training, University of Central Florida, Orlando, FL
- 2013-Present:** Adjunct Associate Professor of Computer Science, Brown University, Providence, RI
- 2005-Present:** Co-founder and VP of Business Strategy, Fluidity Software, Inc., Somerville, MA

2000-Present: Consultant, JJI Interface Consultants, Inc., Oviedo, FL

Consulting services for user interface design and patent litigation. My consultancies include Nextron Medical Technologies, Physion, Inc., Bellissima Cosmetics, Rosebud LMS, Inc., McKinsey and Co., Microsoft Research, Sixense Entertainment, Inc. (Advisory Board Member), SNR Denton, Williams & Connolly LLP, Activision, InGenius Prep, Meta, Raytheon

2012-2015: CAE Link Professor and Associate Professor with Tenure in EECS, University of Central Florida, Orlando, FL

2006-2013: Adjunct Assistant Professor of Computer Science (Research), Brown University, Providence, RI

2010-2012: SAIC Faculty Fellow and Assistant Professor in EECS, University of Central Florida, Orlando, FL

2007-2010: Assistant Professor, University of Central Florida, Orlando, FL

2006-2009: Research Faculty, Microsoft Center for Research on Pen-Centric Computing, Providence, RI

2005-2006: Postdoctoral Research Associate, Brown University, Providence, RI

Continuing work in mathematical sketching as well as exploring how different orientation tracking algorithms work in augmented reality environments.

1998-2005: Research Assistant, Brown University Computer Graphics Lab, Providence, RI

Developed mathematical sketching, an approach to making dynamic illustrations through the combination of handwritten mathematics and free-form drawings and created a mathematical expression recognition system. Studied how different factors such as motion style, sampling rate, prediction time, and noise variance affected various prediction algorithms for human motion tracking in virtual environments. Explored how multimodal interfaces could be used in virtual environments as well as the general topic of improving 3D interfaces in virtual environments. Assisted in the startup and development of the Brown University Technology Center for Advanced Scientific Computing and Visualization.

1999: Teaching Assistant, Brown University, CS-295-5, Interdisciplinary Scientific Visualization

Maintained course web page, prepared class notes, graded homework.

1997: Research Scientist, Fraunhofer Center for Research in Computer Graphics, Providence, RI

Developed demonstration applications for a table-based virtual environment display system utilizing 2D and 3D gesture-based interface techniques.

1996: Software Technician, UCS, Inc., Fort Lauderdale, FL

Performed software test automation and software quality assurance.

1995: Student Intern, IBM, Boca Raton FL

Maintained SQL database query system and performed website development tasks.

HONORS AND AWARDS

2017: UCF Research Incentive Award (RIA)

2017: ACM CHI 2017 Honorable Mention Paper (top 5% of all paper submissions)

2016: Best Paper Award, Ninth IEEE International Conference on the Internet of Things 2016

2016: ACM CHI 2016 Honorable Mention Paper (top 4% of all paper submissions)

2015: Michael A. J. Sweeny Best Student HCI Paper Award – Graphics Interface 2015

2014: ACM CHI 2014 Honorable Mention Paper (top 5% of all paper submissions)

2014: UCF Reach for the Stars Award

2013: UCF Teaching Incentive Program Award (TIP)

2013: UCF Scholarship of Teaching and Learning Award (SOTL)

2013: UCF College of Engineering and Computer Science Deans Research Professorship Award

2013: UCF College of Engineering and Computer Science Excellence in Graduate Teaching Award

2012: Appointed the CAE Link Professor in Electrical Engineering and Computer Science at UCF

2012: UCF Research Incentive Award (RIA)

2012: Named IEEE Senior Member

2011: Best Paper Award, 8th International Conference on Advances in Computer Entertainment Technology

2011: Named ACM Senior Member

2011: Best Poster Award, Eurographics/ACM Symposium on Sketch-Based Interfaces and Modeling

2011: Named to the Eurographics Sketch-Based Interfaces and Modeling steering committee

2010: Appointed the SAIC Faculty Fellow in Electrical Engineering and Computer Science at UCF

2010: ACM CHI 2010 Honorable Mention Paper (top 5% of all paper submissions)

2010: UCF College of Engineering and Computer Science Distinguished Researcher Award

2009: Best Paper Award, Eurographics/ACM Symposium on Sketch-Based Interfaces and Modeling

2009: National Science Foundation CAREER Award

2008: Best Paper Award, 9th International Symposium on Smart Graphics

2007: UCF Presidential Major Equipment Award

2006: Best Paper Award, Eurographics Workshop on Sketch-Based Interfaces and Modeling

2004: Best Paper Presentation (Applied Estimation Session), 2004 American Control Conference

2000-2002, 2004: The van Dam Fellowship

1998: IBM Cooperative Fellowship

1996: FAU's Aaron Finerman Award

1996: FAU's Faculty Award for Outstanding Undergraduate Achievement

1995: Microsoft Senior Achievement Award

Also elected to Sigma Xi (1998), Phi Kappa Phi (1995), and Phi Eta Sigma (1993)

RESEARCH CONTACTS AND GRANTS

Total Funding: \$4,672,885

Total as PI: \$3,880,885

Total as Co-PI: \$792,000

My Share at UCF: \$3,876,798

Active Grants and Contracts

“NRI: Collaborative Research: Sketching Geometry and Physics Informed Inference for Mobile Robot Manipulation in Cluttered Scenes”, NSF Award IIS-1638060, \$286,434, Sole PI (100% credit), Sept. 2016 – August 2019.

“RF: Improving Augmented Reality Technologies for Training and Education”, Lockheed Martin Corporation, \$200,000, PI (80% credit equals \$160,000), Aug. 2016 – Aug. 2018.

“FHTCC: Improving Augmented Reality Technologies for Training and Education”, UCF/I-4 Match, \$66,666 PI (80% credit equals \$52,800), Aug. 2016 – Aug. 2018.

“Interactive Visualization in Support of Decision Making under Uncertainty”, Office of Naval Research Award ONRBAA15001, \$660,000, Co-PI, (54.5% credit equals \$360,000), Sept. 2015 – Oct. 2018.

“Augmented Reality-Based Intelligent Tutoring in the Wild”, US Army RDECOM –STC Award W911QX13C0052, \$489,376, Sole PI (100% credit), Dec. 2014 – April 2018.

Past Grants and Contracts

“Exploring the Benefits of Spatial IDEs”, Coda Enterprises, LLC, \$47,500, Sole PI (100% credit), Jan. 2016 – May 2017.

“Physics Based Multi-Touch Movement Interface Creation for 3D Modeling and Simulation, Phase II”, JHT Incorporated Award JHT13S0002 (Navy SBIR Phase II, Topic N121-061), \$187,500, Sole PI (100% credit), Oct. 2013 – Mar. 2016.

“Physics Based Multi-Touch Movement Interface Creation for 3D Modeling and Simulation, Phase II”, UCF/I-4 Match, \$122,270, Sole PI (100% credit), Aug. 2013 – Mar. 2016.

“CAREER: Mathematical Sketching: Pen-based Tools for Conceptual Understanding in Mathematics and Physics”, NSF CAREER Award IIS-0845921, \$459,776, Sole PI (100% credit), May 2009 – April 2016.

“REU Supplement to CAREER: Mathematical Sketching: Pen-based Tools for Conceptual Understanding in Mathematics and Physics”, NSF CAREER Award IIS-0845921, \$80,000, Sole PI (100% credit), May 2009 – April 2016.

“SHF: Large: A Working Set Approach to Integrated Development Environments”, NSF Award CCF-1012056, Sole PI (100% credit) on Subcontract from Brown University, \$179,823 of \$1,123,918, Aug. 2010 – July 2015.

“Major: Enhancing Creativity and Authoring in STEM Education-Based Virtual Worlds through Concept-Oriented Design”, NSF Award IIS-0856045, \$755,845, PI \$753,835, PI (70% credit equals \$527,684), July 2009 – June 2014.

“REU Supplement to Major: Enhancing Creativity and Authoring in STEM Education-Based Virtual Worlds through Concept-Oriented Design”, NSF Award IIS-0856045, \$40,000, Sole PI (100% credit), July 2010 – June 2014.

“Healthcare Informatics, Implementation, Long Term Care and Aging”, James A. Haley Veterans’ Hospital, \$26,661, Sole PI (100% credit), April 2013 – Mar. 2014.

“Feasibility for the Development of a Physics, Navigation, and Meta Gestures API for Training, Simulations, and Entertainment”, JHT Incorporated Award JHT12S0003 (Navy SBIR Phase I, Topic N121-061), \$42,100, Sole PI (100% credit), June 2012 – Dec. 2013.

“Feasibility for the Development of a Physics, Navigation, and Meta Gestures API for Training, Simulations, and Entertainment”, UCF/I-4 Match, \$14,033, Sole PI (100% credit), July 2012 – Dec. 2013.

“Extending Smart Home Technology for Cognitively Impaired Veterans to Delay Institutionalization (Part II)”, James A. Haley Veterans’ Hospital, \$33,000, Sole PI (100% credit), April 2013 – Sept. 2013.

“Naturalistic Operator Interface for Immersive Environments”, Design Interactive, Inc. Award EGO6389UCF (DoD OSD SBIR Phase I), \$49,700, PI (50% credit equals \$24,850), March 2013 – Aug. 2013.

“Naturalistic Operator Interface for Immersive Environments”, UCF/I-4 Match, \$16,666, PI (50% credit equals \$8,333), March 2013 – Aug. 2013.

“Robot Platforms for Research and Education in Human Robot Interaction”, UCF Major Research Equipment Award, \$54,200, PI (50% credit equals \$27,100), Feb. 2013 – June 2013.

“Dynamic 3D Stereo Visualization of Physics Concepts through a Hybrid Stylus Interface”, Infinite Z, \$10,000, PI (100% credit), Dec. 2012 – Aug. 2013.

“VR and Gaming Project Exploration”, James A. Haley Veterans’ Hospital Award VA673C10812, \$40,000, PI (100% credit), Sept. 2011 – Jan. 2013.

“Personalized Self-Efficacy Virtual Environment Recovery Experience (PERSEVERE)”, Intelligent Automation, Inc. Award 9762 (NIH SBIR Phase I, Topic 141), \$15,889, PI (100% credit), Aug. 2012 – Jan. 2013.

“Realistic Full Body Interfaces for Locomotion and Communication in 3D Virtual Environments”, US Army RDECOM Award W91CRB-10-C-0212, \$175,000, PI (100% credit), Sept. 2010 – Dec. 2012.

“Prototyping Tools for Unobtrusive Mood Assessment”, RDECOM-STC Award W91CRB-09-C-0504, \$150,000, PI (100% credit), May 2009 – Sept. 2011.

“Deep Green Program Support”, Science Applications International Corporation Award 4400157271, \$60,247, Sole PI (100% credit), June 2008 – June 2009.

“Deep Green Program Support”, UCF/I-4 Match, \$33,614, Sole PI (100% credit), July 2008 – June 2009.

“Interaction and the Analyst Workstation of the Future”, US Air Force Research Lab Award FA87500820202, \$70,000, Sole PI (100% credit), June 2008 – June 2009.

“Sketching Mathematical Algorithms”, US Air Force Research Lab A-SpaceX Award FA8750-08-C-0131, Sole PI (100% credit) on Subcontract from Brown University, \$53,078 of \$250,000, Feb. 2008 – Feb. 2009.

“Pre-Visualization of Content Creation and User Experience for Free-Choice Learning Venues”, UCF Presidential Major Equipment Award, \$47,574, PI (50% credit equals \$23,787), Dec. 2007 – Nov. 2008.

“Sketching Mathematical Algorithms”, Disruptive Technology Office A-SpaceX Award N61339-06-C-0186, Sole PI (100% credit) on Subcontract from Brown University, \$75,943 of \$350,000, Sept. 2006 – Dec. 2007.

“Adaptive Real-Time Learning for Mathematical Expression Recognition in Mathematical Sketching”, NSF STTR Phase I Award OII-0611012, \$132,000, Co-PI (23% credit), PI: Donald P. Carney, July 2006 – June 2007.

PUBLICATIONS

Total Citations (according to Google Scholar): 7047

h-index: 34

Books

LaViola, J., Kruijff, E., McMahan, R., Bowman, D., and Poupyrev, I. *3D User Interfaces: Theory and Practice*, Second Edition, Addison Wesley, April 2017.

Bowman, D., Kruijff, E., LaViola, J., and Poupyrev, I. *3D User Interfaces: Theory and Practice*, Addison Wesley, July 2004. (cited 1656 times, source: [Google Scholar](#))

Book Chapters

Wang, G., Bowditch, N., Zeleznik, R., Kwon, M., and LaViola, J. “A Tablet-Based Math Tutor for Beginning Algebra”. *Revolutionizing Education with Digital Ink*, T. Hammond, S. Valentine, and A. Adler (eds.), Springer, 91-102, June 2016.

LaViola, J., Buchanan, S., and Pittman, C. “Multimodal Input for Perceptual User Interfaces”. *Interactive Displays*, A. Bhowmik (ed.), Wiley, 285-312, October 2014.

Williamson, B., Wingrave, C., and LaViola, J. “Full Body Locomotion with Video Game Motion Controllers”. *Human Walking in Virtual Environments*, F. Steinicke, Y. Visell, J. Campos, and A. Lecuyer (eds.), Springer, 351-376, May 2013.

LaViola, J. “Mathematical Sketching: An Approach to Making Dynamic Illustrations”. *Sketch-based Interfaces and Modeling*, J. Jorge and F. Samavati (eds.), Springer Verlag London Limited, 81-118, December 2010.

LaViola, J. “Input Devices”, *Wiley Encyclopedia of Computer Science and Engineering*, B. Wah (ed.), Wiley, Vol.3, 1575-1584, January 2009.

LaViola, J., Prabhat, Forsberg, A., Laidlaw, D., and van Dam, A. “Virtual Reality-Based Interactive Scientific Visualization Environments”. *Trends in Interactive Visualization: State-of-the-Art Survey*, E. Zudilova-Seinstra, T. Adriaansen, and R. van Liere (eds.), Springer Verlag London Limited, 225-250, January 2009.

Edited Books

LaViola, J., Pan, Z., Coquillart, S., and Schmalstieg, D. (eds.) *IEEE Virtual Reality 2013*, IEEE Press, March 2013.

Billinghurst, M., LaViola, J., and Lecuyer, A. (eds.) *IEEE Symposium on 3D User Interfaces 2012*, IEEE Press, March 2012.

LaViola, J., Hachet, M., and Billinghurst, M. (eds.) *IEEE Symposium on 3D User Interfaces 2011*, IEEE Press, March 2011.

Hachet, M., Kiyokawa, K., and LaViola, J. (eds.) *IEEE Symposium on 3D User Interfaces 2010*, IEEE Press, March 2010.

Grimm C. and LaViola J. (eds.). *ACM SIGGRAPH/Eurographics Symposium Proceedings: Sketch-Based Interfaces and Modeling 2009*, ACM Press, August 2009.

Refereed Journals and Periodicals

Kulshreshth, A., Pfeil, K., and LaViola, J. “Enhancing the Gaming Experience Using 3D Spatial User Interface Technologies”, *IEEE Computer Graphics and Applications*, 38(3):16-23, May-June 2017.

Taranta, E., Vargas, A., Compton, S. and LaViola, J. “A Dynamic Pen-Based Interface for Writing and Editing Complex Mathematical Expressions with Math Boxes”, *ACM Transactions on Interactive Intelligent Systems*, 6(2): Article 13 (25 pages), August 2016.

Taranta, E., Vargas, A., and LaViola, J. “Streamlined and Accurate Gesture Recognition with Penny Pincher”, *Computers and Graphics*, Volume 55, 130-142, April 2016.

Bott, J. and LaViola, J. “The WOZ recognizer: A Wizard of Oz Sketch Recognition System”, *ACM Transactions on Interactive Intelligent Systems*, 5(3): Article 15 (38 pages), October 2015.

Taranta, E., Simons, K., Sukthankar, R., and LaViola, J. “Exploring the Benefits of Context in 3D Gesture Recognition for Game-Based Virtual Environments”, *ACM Transactions on Interactive Intelligent Systems*, 5(1):Article 1 (34 pages), March 2015.

Khuong, B., Kiyokawa, K., Miller, A., LaViola, J., Mashita, T., and Takemura, H. “Context-Related Visualization Modes of an AR-Based Context-Aware Assembly Support System in Object Assembly”, *Transactions of the Virtual Reality Society of Japan*, 19(2):195-205, June 2014.

Buchanan, S. and LaViola J., “CSTutor: A Sketch-Based Tool for Visualizing Data Structures”, *ACM Transactions of Computing Education*, 14(1):Article 3 (28 pages), March 2014.

Reiss, S., Bott, J., and LaViola, J., “Plugging In and Into Code Bubbles: The Code Bubbles Architecture”, *Journal of Software: Practice and Experience*, 44(3):261-276, March 2014.

LaViola, J., “3D Gestural Interaction: The State of the Field,” *ISRN Artificial Intelligence*, Vol. 2013, Article ID 514641, 18 pages, 2013.

Gupta, P., Lobo, N., and LaViola, J. “Markerless Tracking and Gesture Recognition using Polar Correlation of Camera Optical Flow”, *Machine Vision and Applications*, 24(3):651-666, April 2013.

Ellis, C., Masood, Z., Tappen, M., LaViola, J., and Sukthankar, R. “Exploring the Trade-off Between Accuracy and Observational Latency in Action Recognition”, *International Journal of Computer Vision*, 101(3):420-436, February 2013. (cited 147 times, source: [Google Scholar](#))

Cheema, S., Hoffman, M., and LaViola, J. “3D Gesture Classification With Linear Acceleration and Angular Velocity Sensing Devices for Video Games”, *Entertainment Computing*, 4(1):11-24, February 2013.

Tomlinson, B., Patterson, D., Pan, Y., Blevis, B., Nardi, B., Silberman, S., Norton, J., and LaViola, J. “What If Sustainability Doesn’t Work Out?”, *Interactions*, 19(6):50-55, November/December 2012.

Varcholik, P., LaViola, J., and Hughes, C. “Establishing a Baseline for Text Entry for a Multi-Touch Virtual Keyboard”, *International Journal of Human-Computer Studies*, 70(10):657-672, October 2012.

Cashion, J., Wingrave, C., and LaViola, J. “Dense and Dynamic 3D Selection for Game-based Virtual Environments”, *IEEE Transactions on Visualization and Computer Graphics (Proceedings of Virtual Reality 2012)*, 18(4):634-642, April 2012.

Miller, A., White, B., Charbonneau, E., Kanzler, Z., and LaViola, J. “Interactive 3D Model Acquisition and Tracking of Building Block Structures”, *IEEE Transactions on Visualization and Computer Graphics (Proceedings of Virtual Reality 2012)*, 18(4):651-659, April 2012.

Xiong, Y. and LaViola, J. “A ShortStraw-Based Algorithm for Corner Finding in Sketch-Based Interfaces”, *Computers and Graphics*, 34(5):513-527, October 2010.

Wingrave, C. and LaViola, J. “Reflection on the Design and Implementation of Virtual Environments”, *PRESENCE: Teleoperators and Virtual Environments*, 19(2):179-195, April 2010.

Wingrave, C., Williamson, B., Varcholik, P., Rose, J., Miller, A., Charbonneau, E., Bott, J. and LaViola, J. “Wii Remote and Beyond: Using Spatially Convenient Devices for 3DUIs”, *IEEE Computer Graphics and Applications*, 30(2):71-85, March/April 2010. (cited 121 times, source: [Google Scholar](#))

Wingrave, C., LaViola, J. and Bowman, D. “A Natural, Tiered and Executable UIDL for 3D User Interfaces Based on Concept-Oriented Design”, *ACM Transactions on Computer-Human Interaction (TOCHI)*, 16(4):Article 21 (36 pages), November 2009.

Zelevnik, R., Miller, T., van Dam, A., Li, C., Tenneson, D., Maloney, C., and LaViola, J. “Applications and Issues in Pen-Centric Computing”, *IEEE Multimedia*, 15(4):14-21, October-December 2008.

LaViola, J. “Bringing VR and Spatial 3D Interaction to the Masses through Video Games”, *IEEE Computer Graphics and Applications*, 28(5):10-15, September/October 2008.

LaViola, J., and Zelevnik, R. “A Practical Approach to Writer-Dependent Symbol Recognition Using a Writer-Independent Recognizer”, *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 29(11):1917-1926, November 2007.

LaViola, J. “An Initial Evaluation of MathPad²: A Tool for Creating Dynamic Mathematical Illustrations”, *Computers and Graphics*, 31(4):540-553, August 2007.

Julier, S., and LaViola, J. “On Kalman Filtering with Nonlinear Equality Constraints”, *IEEE Transactions on Signal Processing*, 55(6):2774-2784, June 2007. (cited 250 times, source: [Google Scholar](#))

LaViola, J. “Advances in Mathematical Sketching: Moving Toward the Paradigm’s Full Potential”, *IEEE Computer Graphics and Applications*, 27(1):38-48, January/February 2007.

Katzourin, M., Ignatoff, D., Quirk, L., LaViola, J., and Jenkins, O. “SwordPlay: Innovating Game Development through VR”, *IEEE Computer Graphics and Applications*, 26(6):15-19, November/December 2006.

LaViola, J. and Zeleznik, R. “MathPad²: A System for the Creation and Exploration of Mathematical Sketches”, *ACM Transactions on Graphics (Proceedings of SIGGRAPH 2004)*, 23(3):432-440, August 2004. (cited 246 times, source: [Google Scholar](#))

Bowman, D., Kruijff, E., LaViola, J., and Poupyrev, I. “An Introduction to 3-D User Interface Design”, *PRESENCE: Teleoperators and Virtual Environments*, 10(1):96-108, February 2001. (cited 372 times, source: [Google Scholar](#))

Van Dam, A., Forsberg, A., Laidlaw, D., LaViola, J., and Simpson, R. “Immersive VR for Scientific Visualization: A Progress Report”, *IEEE Computer Graphics and Applications*, 20(6):26-52, November/December 2000. (cited 268 times, source: [Google Scholar](#))

LaViola, J. “A Discussion of Cybersickness in Virtual Environments”, *SIGCHI Bulletin* 32(1):47-56, January 2000. (cited 306 times, source: [Google Scholar](#))

Forsberg, A., LaViola, J., Markosian, L., and Zeleznik, R. “Seamless Interaction in Virtual Reality”, *IEEE Computer Graphics and Applications*, 17(6):6-9, November/December 1997.

Refereed Conferences and Workshops

Newton, O., Fiore, S., and LaViola, J. “An External Cognition Framework for Visualizing Uncertainty in Support of Situation Awareness”, *Proceedings of the 2017 Human Factors and Ergonomics Society Annual Meeting (HFES 2017)*, 1198-1202, October 2017.

Fiore, S., Warta, S., Best, A., Newton, O., and LaViola, J. “Developing A Theoretical Framework of Task Complexity for Research on Visualization in Support of Decision Making Under Uncertainty”, *Proceedings of the 2017 Human Factors and Ergonomics Society Annual Meeting (HFES 2017)*, 1193-1197, October 2017.

Khaloo, P., Maghoumi, M., Taranta, E., Bettner, D., and LaViola, J. “Code Park: A New 3D Code Visualization Tool”, *Proceedings of the Fifth IEEE Working Conference on Software Visualization (VISSOFT 2017)*, 11 pages, September 2017.

Kang, B., LaViola, J., and Wisniewski, P. “Examining Interaction Modality Effects Toward Engagement in an Interactive Learning Environment”, *Proceedings of the Twelfth European Conference on Technology Enhanced Learning (EC-TEL 2017)*, 97-110, September 2017.

Buchanan Holderness, S., Bott, J., Wisniewski, P., and LaViola, J. “Exploring Multi-touch Contact Size for Z-Axis Movement in 3D Environments”, *Proceedings of Graphics Interface 2017*, 65-72, May 2017.

Pittman, C., and LaViola, J. “Multiwave: Complex Hand Gesture Recognition Using the Doppler Effect”, *Proceedings of Graphics Interface 2017*, 97-103, May 2017.

Kang, B., LaViola, J., and Wisniewski, P. “Structured Input Improves Usability and Precision for Solving Geometry-based Algebraic Problems”, *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems (CHI '17)*, 4692-4702, May 2017.

Taranta, E., Samiei, A., Maghoumi, M., Khaloo, P., Pittman, C., and LaViola, J. “Jackknife: A Reliable Recognizer with Few Samples and Many Modalities”, *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems (CHI '17)*, 5850-5861, May 2017. (CHI 2017 Honorable Mention Paper)

Martin, K. and LaViola, J. “The Transreality Interaction Platform: Enabling Interaction Across Physical and Virtual Reality”. *Proceedings of the Ninth International Conference on the Internet of Things (iThings 2016)*, 177–186, December 2016. (Best Paper Award)

Taranta, E., Maghoumi, M., Pittman, C., and LaViola, J. “A Rapid Prototyping Approach to Synthetic Data Generation for Improved 2D Gesture Recognition”. *Proceedings of the 29th Annual Symposium on User Interface Software and Technology (UIST '16)*. 873-885, October 2016.

Kulshreshth, A. and LaViola, J. “Dynamic Stereoscopic 3D Parameter Adjustment for Enhanced Depth Discrimination”. *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems (CHI '16)*, 177-187, May 2016. (CHI 2016 Honorable Mention Paper)

Pittman, C., Wisniewski, P., Brooks, C., and LaViola, J. “Multiwave: Doppler Effect Based Gesture Recognition in Multiple Dimensions”. *Proceedings of the 2016 CHI Conference Extended Abstracts on Human Factors in Computing Systems (CHI EA '16)*. 1729-1736, May 2016.

Pittman, C., Taranta, E., and LaViola, J. “A \$-Family Friendly Approach to Prototype Selection”, *Proceedings of the 21st International Conference on Intelligent User Interfaces (IUI 2016)*, 370-374, March 2016.

Kang, B., Kulshreshth, A., and LaViola, J. “AnalyticalInk: An Interactive Learning Environment for Math Word Problem Solving”, *Proceedings of the 21st International Conference on Intelligent User Interfaces (IUI 2016)*, 419-430, March 2016.

LaViola, J., Sottolare, R., Williamson, B., Brooks, C., Veazanchin, S., and Garrity, P. “Using Augmented Reality to Tutor Military Tasks in the Wild”, *Proceedings of the Interservice/Industry Training, Simulation, and Education Conference (IITSEC) 2015*, 10 pages, December 2015.

Sottolare, R., and LaViola, J. “Extending Intelligent Tutoring Beyond the Desktop to the Psychomotor Domain”, *Proceedings of the Interservice/Industry Training, Simulation, and Education Conference (IITSEC) 2015*, 11 pages, December 2015.

Buchanan, S., Bott, J., and LaViola, J. “The Influence of Multi-Touch Interaction on Procedural Training”, *Proceedings of the 2015 International Conference on Interactive Tabletops & Surfaces*, 5-14, November 2015.

Taranta, E. and LaViola, J. “Penny Pincher: A Blazing Fast, Highly Accurate \$-Family Recognizer”, *Proceedings of Graphics Interface 2015*, 195-202, June 2015. (Michael A. J. Sweeny Best Student HCI Paper Award)

Veazanchin, S. and LaViola, J. “DynoFighter: Exploring a Physical Activity Incentive Mechanism to Support Exergaming”, *Proceedings of Graphics Interface 2015*, 281-284, June 2015.

Kulshreshth, A. and LaViola, J. “Exploring 3D User Interface Technologies for Improving The Gaming Experience”, *Proceedings of the 2015 ACM Annual Conference on Human Factors in Computing Systems (CHI 2015)*, 125-134, April 2015.

Kulshreshth, A. and LaViola, J. “Enhanced Depth Discrimination Using Dynamic Stereoscopic 3D Parameters”, *Proceedings of the 2015 ACM Annual Conference on Human Factors in Computing Systems Extended Abstracts (CHI EA 2015), Work-In-Progress*, 1615-1620, April 2015.

Taranta, E. and LaViola, J. “Math Boxes: A Pen-Based User Interface for Writing Difficult Mathematical Expressions”, *Proceedings of the 2015 ACM International Conference on Intelligent User Interfaces (IUI 2015)*, 87-96, March 2015.

Koh, S., Pfeil, K., and LaViola, J. “Enhancing the Robot Avateering Metaphor Discreetly with an Assistive Agent and its Effect on Perception”, *Proceedings of the 23rd IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN 2014)*, 1095-1102, August 2014.

Kang, B., Hu, H., and LaViola, J. “Mixed Heuristic Search for Sketch Prediction on Chemical Structure Drawing”, *Proceedings of the 4th Joint Symposium on Computational Aesthetics, Non-Photorealistic Animation and Rendering, and Sketch-Based Interfaces and Modeling (SBIM 2014)*, 27-34, August 2014.

Kulshreshth, A. and LaViola, J. “Exploring the Usefulness of Finger-Based 3D Gesture Menu Selection”, *Proceedings of the 2014 ACM Annual Conference on Human Factors in Computing Systems (CHI 2014)*, 1093-1102, April 2014. (CHI 2014 Honorable Mention Paper)

Schild, J., LaViola, J., and Masuch, M. “Altering Gameplay Behavior using Stereoscopic 3D Vision-Based Video Game Design”, *Proceedings of the 2014 ACM Annual Conference on Human Factors in Computing Systems (CHI 2014)*, 207-216, April 2014.

Charbonneau, E., Buchanan, S., Bott, J., Mueller, F., and LaViola, J. “Dance Enhanced: Investigating How Earning Content Through Exertion Impacts Dance Game Enjoyment”, *Proceedings of the 9th International Conference on the Foundations of Digital Games (FDG 2014)*, Paper 6 (8 pages), April 2014.

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Cashion, J. and LaViola, J. “Dynamic Adaptation of 3D Selection Techniques for Suitability Across Diverse Scenarios”, *Proceedings of the IEEE Symposium on 3D User Interfaces 2014*, 165-166 March 2014.

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Norton, J., Stringfellow, A., and LaViola, J. “Domestic Plant Guilds: A Novel Application for Sustainable HCI”, *CHI 2012 Workshop on Simple, Sustainable Living*, May 2012.

Buchanan, S., Ochs, B., and LaViola, J. “CS Tutor: A Pen-Based Tool for Visualizing Data Structures”, *Eighth Eurographics/ACM Symposium on Sketch-Based Interfaces and Modeling 2011*, August 2011. **(Best Poster Award)**

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STUDENT ADVISING

Post-Doc:

Chadwick Wingrave (2008 – 2012)

PhD

Ravikiran Kattoju, started Fall 2016

Kate Kapalo, started Fall 2016

Amirreza Samiei, started Summer 2016

Kyle Martin, started Summer 2016

Kevin Pfeil, started Fall 2016

Mehran Maghoumi, started Summer 2015

Andres Vargas, started Fall 2014

Eugene Taranta, started Fall 2013

Seng Lee Koh, started Summer 2013

Corey Pittman, started Fall 2012

Sarah Buchanan, Ph.D. 2017. Dissertation Title: Exploring the Multi-touch Interaction Design Space for 3D Virtual Objects to Support Procedural Training Tasks

Jared Bott, Ph.D. 2016. Dissertation Title: The WOZ Recognizer: A Tool For Understanding User Perceptions of Sketch-based Interfaces

Arun Kulshreshth, Ph.D. 2015. Dissertation Title: Exploring 3D User Interface Technologies for Improving the Gaming Experience

Salman Cheema, Ph.D. 2014. Dissertation Title: Pen-Based Methods for Recognition and Animation of Handwritten Physics Solutions

Jeffrey Cashion, Ph.D. 2014. Dissertation Title: Intelligent Selection Techniques for Virtual Environments

Emiko Charbonneau, Ph.D. 2013. Dissertation Title: Bridging the Gap Between Fun and Fitness: Instructional Techniques and Real-World Applications for Full Body Dance Games

Paul Varcholik, Ph.D. 2011. Dissertation Title: Multi-Touch for General-Purpose Computing: An Examination of Text Entry

Masters:

Chuck Greenwood, started Summer 2015

Pooya Khaloo, M.S., 2017, Thesis Title: Code Park: A New 3D Code Visualization Tool and IDE

Andres Vargas, M.S., 2014. Thesis Title: SKETCHART: A Pen-Based Tool for Chart Generation and Interaction

Kevin Pfeil, M.S., 2013. Thesis Title: An Exploration of Unmanned Aerial Vehicle Direct Manipulation Through 3D Spatial Interaction

Travis Cossairt, M.S. 2012. Thesis Title: SetPad: A Sketch-Based Tool for Exploring Discrete Math Set Problems

Tad Litwiller, M.S. 2010. Thesis Title: Evaluating the Benefits of 3D Stereo in Modern Video Games

Prince Gupta, M.S. 2010. Thesis Title: Markerless Tracking Using Polar Correlation of Camera Optical Flow

Brian Williamson, M.S. 2009. Thesis Title: RealNav: Exploring Natural User Interfaces for Locomotion in Video Games

Jared Bott, M.S. 2009. Thesis title: VectorPad: A Tool for Visualizing Vector Operations

Undergraduate:

Anamary Leal, B.S. 2009. Honors Thesis title: Exploring the Effectiveness of 3D File Browsing Techniques for File Searching Tasks

Thesis and Dissertation Committees:

Paul Szerlip, Ph.D., Computer Science, 2015

Amy Hoover, Ph.D., Computer Science, 2014

Yiyang Xiong, Ph.D., Computer Science, 2014

Bennie Lewis, Ph.D., Computer Science, 2014

Subhabrata Bhattacharya, Ph.D., Computer Science, 2013

Joseph Keebler, Ph.D. Psychology, 2011

Kennard Laviers, Ph.D. Computer Science, 2011

Juraj Obert, Ph.D. Computer Science, 2010

Dustin Chertoff, Ph.D., Modeling and Simulation, 2009

Jingen Liu, Ph.D., Computer Science, 2009

TEACHING

* indicates courses I developed and have revised through the years

Course Number	Course Title	Credits	Class	Semester	# of Students	Students Eval Score (out of 5)
CAP 6121*	3D User Interfaces for Games and Virtual Reality	3	Grad	Spring 2017	15	4.38
CAP 6105*	Pen-Based User Interfaces	3	Grad	Fall 2016	7	4.67
CAP 6121*	3D User Interfaces for Games and Virtual Reality	3	Grad	Spring 2016	13	4.38

CAP 6105*	Pen-Based User Interfaces	3	Grad	Fall 2015	13	4.0
CAP 6121*	3D User Interfaces for Games and Virtual Reality	3	Grad	Spring 2015	15	4.12
COP 3503H	Honors Computer Science II	3	Ugrad	Fall 2014	12	4.0
CAP 6121*	3D User Interfaces for Games and Virtual Reality	3	Grad	Spring 2014	6	5.0
CAP 6105*	Pen-Based User Interfaces	3	Grad	Fall 2013	7	4.5
CAP 6121*	3D User Interfaces for Games and Virtual Reality	3	Grad	Spring 2013	12	4.0
COP 3503H	Honors Computer Science II	3	Ugrad	Fall 2012	17	3.75
CAP 6105*	Pen-Based User Interfaces	3	Grad	Fall 2012	9	4.67
CAP 6121*	3D User Interfaces for Games and Virtual Reality	3	Grad	Spring 2012	19	3.75
COP 3223	Intro to Programming with C	3	Ugrad	Fall 2011	168	3.18
CAP 6105*	Pen-Based User Interfaces	3	Grad	Fall 2011	10	5.0
CAP 6121*	3D User Interfaces for Games and Virtual Reality	3	Grad	Spring 2011	15	4.33
COP 3223	Introduction to C Programming	3	Ugrad	Fall 2010	226	3.43
CAP6105*	Pen-Based User Interfaces	3	Grad	Fall 2010	10	5.0
CAP 6121*	3D User Interfaces for Games and Virtual Reality	3	Grad	Spring 2010	13	4.5
CAP 6105*	Pen-Based User Interfaces	3	Grad	Fall 2009	14	3.85
COP 3223	Introduction to C Programming	3	Ugrad	Fall 2009	229	2.65
CAP 6938*	3D User Interfaces for Games and Virtual Reality	3	Grad	Spring 2009	14	4.0
CAP 6938*	Topics in Pen-Based User Interfaces	3	Grad	Fall 2008	13	4.0
CAP 6938*	3D User Interfaces for Games and Virtual Reality	3	Grad	Spring 2008	14	4.5
CAP 5937/6938*	Topics in Pen-Based User Interfaces	3	Grad	Fall 2007	19	4.17

COP 3502H	Honors Computer Science I	3	Ugrad	Spring 2007	19	2.89
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Other courses taught:

ISC 2215: Applications of Calculus I, UCF EXCEL Program, Co-Instructor (Spring 2012)

ISC 2216: Applications of Calculus II, UCF EXCEL Program, Co-Instructor (Spring 2012)

ISC 2215: Applications of Calculus I, UCF EXCEL Program, Co-Instructor (Fall 2011)

ISC 2215: Applications of Calculus I, UCF EXCEL Program, Co-Instructor (Spring 2011)

ISC 2216: Applications of Calculus II, UCF EXCEL Program, Co-Instructor (Spring 2011)

ISC 2215: Applications of Calculus I, UCF EXCEL Program, Co-Instructor (Fall 2010)

ISC 2215: Applications of Calculus I, UCF EXCEL Program, Co-Instructor (Spring 2010)

ISC 2216: Applications of Calculus II, UCF EXCEL Program, Co-Instructor (Spring 2010)

ISC 2215: Applications of Calculus I, UCF EXCEL Program, Co-Instructor (Fall 2009)

CS 193-33: Independent Study with Michael Katzourin, Department of Computer Science, Brown University (Fall 2006)

INVITED TALKS

“3D Spatial User Interfaces: Past, Present, and Future from the Virtual to the Real”

- Brown University, Providence, RI (May 2015)

“Intelligent Tutoring Interfaces with Mathematical Sketching”

- Duke University, Durham, NC (December 2014)
- Arizona State University, Phoenix, AZ (November 2013)

“QuickDraw: Improving Drawing for Geometric Diagrams”

- Microsoft Research Faculty Summit 2012, Redmond, WA (July 2012)

“3D Spatial Interaction with Commodity Hardware”

- GameTech 2012 Users’ Conference, Orlando, FL (March 2012)

“Towards Intelligent Tutoring with Mathematical Sketching”

- INRIA Bordeaux - Sud-Ouest , Talence Cedex, France (July 2011)
- Microsoft Research, Redmond, WA (May 2011)

“Spatial 3D Interaction and Video Games”

- Washington University in St. Louis, St. Louis, MO (December 2008)
- Electronic Arts, Maitland, FL (August 2008)

“Research at the Interactive Systems and User Experience Lab”

- The Burnett Honors College, Orlando, FL (July 2008)

“Mathematics, Physics, and Chemistry: Tablet PC Research and Education”

- Florida Virtual School 14th Annual Staff Conference, Orlando, FL (September 2010)
- Modeling, Simulation, and Training techCAMP, Orlando, FL (January 2008)
- Modeling, Simulation, and Training techCAMP, Orlando, FL (November 2007)

“Mathematics, Physics, and Chemistry: Tablet PC Research and Education at Brown University”

- Pace University, NY, NY (April 2006)

“Mathematical Sketching: A New Approach for Creating and Exploring Dynamic Illustrations”

- Workshop on Computer Graphics: Current Trends in Research and Industry, Lahore University of Management Science, Pakistan (July 2007)
- SUNY Stony Brook, Stony Brook, NY (March 2006)
- Lehigh University, Bethlehem, PA (March 2006)
- University of Central Florida, Orlando, FL (March 2006)
- Aptima, Woburn, MA (September 2005)
- Wolfram Research, Champaign, IL (May 2005)
- Microsoft Research, Redmond, WA (February 2005)
- IBM Thomas J. Watson Research Center, Hawthorne, NY (December 2004)

SERVICE TO THE PROFESSION

Associate Editor: IEEE Computer Graphics & Applications (2013-present)
 ACM Transactions on Interactive Intelligent Systems (2013-present)
 International Journal of Human-Computer Studies (2010-present)

NSF Panelist: Computer & Information Science & Engineering Directorate (April 2016)
 Computer & Information Science & Engineering Directorate (April 2015)

Computer & Information Science & Engineering Directorate (May 2014)
Computer & Information Science & Engineering Directorate (September 2013)
Computer & Information Science & Engineering Directorate (April 2012)
Computer & Information Science & Engineering Directorate (April 2010)
Computer & Information Science & Engineering Directorate (January 2009)
Computer & Information Science & Engineering Directorate (September 2009)

General Chair: Eurographics Symposium on Sketch-Based Interfaces and Modeling 2010

Program Chair: IEEE Virtual Reality 2013
IEEE Symposium on 3D User Interfaces 2012
IEEE Symposium on 3D User Interfaces 2011
IEEE Symposium on 3D User Interfaces 2010
Eurographics Symposium on Sketch-Based Interfaces and Modeling 2009

Associate Program Chair: ACM Intelligent User Interfaces 2012
Foundations of Digital Games 2012

Steering Committees: Eurographics Symposium on Sketch-Based Interfaces and Modeling (2011-2013)

Panels Chair: IEEE Virtual Reality 2006

Publications Chair: IEEE Virtual Reality 2007-2009

Program Committees: ACM Symposium on Spatial User Interaction (2013,2014)
ACM Virtual Reality Software and Technology (2009-2010)
ACM Intelligent User Interfaces (2009, 2018)
Eurographics Short Papers Program (2008)
IEEE Symposium on 3D User Interfaces (2007-2009, 2014, 2017)
IEEE Virtual Reality (2007-2011, 2014)
Eurographics Symposium on Sketch-Based Interfaces and Modeling (2007-2008, 2011, 2012, 2013, 2014, 2017)
6th IEEE International Symposium on Mixed and Augmented Reality (2007)
2nd International Symposium on Visual Computing (2006)

Journal Reviewer: *Human Computer Interaction* (2015)

Computer Vision and Image Understanding (2014)

Presence: Teleoperators and Virtual Environments (2014)

IEEE Transactions on Neural Systems and Rehabilitation Engineering (2012)

ACM Transactions on Multimedia Computing Communications and Applications (2011)

ACM Transactions on Interactive Intelligent Systems (2010-2011)

Journal of Visual Languages and Computing (2009)

ACM Transactions on Computer-Human Interaction (2009, 2014)

IEEE Transactions on Aerospace and Electronic Systems (2009)

International Journal of Human Computer Studies (2008-2011)

Pattern Recognition (2007)

Computers and Graphics (2001, 2006- 2008,2010,2011, 2013)

IEEE Transactions on Pattern Analysis and Machine Intelligence (2007)

IEEE Computer Graphics and Applications (2002-2003, 2005-2006, 2008, 2009)

Computer Animation & Virtual Worlds (2006)

IEEE Transactions on Visualization and Computer Graphics (2005, 2006, 2010,2011)

IEEE Transactions on Robotics (2005)

Virtual Reality (2005, 2010, 2012)

Pattern Recognition Letters (2005)

External Conference Reviewer: ACM/IEEE Human Robot Interaction (2016)
WIPTTE (2015)
ACM Designing Interactive Systems (2014)
ACM Annual Symposium on Computer-Human Interaction in Play (2014)
ACM International Conference on Multimodal Interaction (2013, 2014)
ACM Interactive Tabletops and Surfaces (2010)
ACM SIGGRAPH ASIA (2009,2010)
ACM SIGGRAPH Sketches and Poster's Juror (2007)
Graphics Interface (2005, 2007, 2009, 2010, 2012)
Eurographics Workshop on Virtual Environments (2002, 2004, 2007)
ACM UIST (2003, 2005, 2006, 2008, 2010 - 2017)
ACM CHI (2005-2006, 2010-2018)
ACM Virtual Reality Software and Technology (2005, 2017)
ACM Intelligent User Interfaces (2013, 2018)
IEEE International Symposium on Wearable Computers (2010)
IEEE Virtual Reality (2005, 2012, 2017)
IEEE Visualization (2004)
ACM SIGGRAPH (2004, 2008, 2010, 2011, 2013, 2014, 2017)
12th IEEE Mediterranean Conference on Control and Automation (2004)
IEEE and ACM International Symposium on Mixed and Augmented Reality (2003, 2008, 2009, 2010, 2011, 2012, 2013, 2014)
ACM Symposium on Interactive 3D Graphics (2003)
ACM SIGGRAPH courses (1999)

SERVICE TO UCF

Member, SOTL Review Committee, UCF, 2017
Member, Faculty Search Committee, Modeling and Simulation Graduate Program, 2016
Director, Modeling and Simulation Graduate Program, UCF, 2015-2017
Member, SOTL Review Committee, UCF, 2014
Member, TIP Criteria Committee, CECS, 2014
Member, Faculty Search Committee, EECS, 2013-2016
Member, EECS, Computer Science Division Executive Committee, 2013-2017
Member, EECS, Computer Science Division Website Committee, 2013
Member, Search Committee, Center for Research in Computer Vision, 2012
Member, Lecturer Promotion Committee, EECS, 2012
Member, Graduate Program Advisory Committee for the M&S Graduate Program, 2011-2012
Member, Industrial Advisory Committee, EECS, 2007-2009.
Member, Space Committee, EECS, 2008-2009.
Member, Faculty Search Committee, EECS 2009-2010.
Faculty, UCF EXCEL Program, 2009-2012

REFERENCES

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