

**JOSEPH J. LAVIOLA JR.**  
**Curriculum Vitae**

University of Central Florida  
Department of Computer Science  
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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**

- 2020-Present:** Secondary Joint Appointment, Faculty Cluster Initiative – Learning Sciences Cluster, University of Central Florida, Orlando, FL
- 2020-Present:** Secondary Joint Appointment, Faculty Cluster Initiative – Disability, Aging, and Technology Cluster, University of Central Florida, Orlando, FL
- 2018-Present:** Charles N. Millican Professor of Computer Science, University of Central Florida, Orlando, FL
- 2019-Present:** Visiting Scholar in Computer Science, Brown University, Providence, RI
- 2014-Present:** Director of the Interactive Computing Experiences Research Cluster, University of Central Florida, Orlando, FL
- 2008-Present:** Affiliated Research Faculty, Institute for Simulation and Training, University of Central Florida, Orlando, FL
- 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., SNR Denton, Williams & Connolly LLP, Activision, InGenius Prep, Meta, Raytheon, Shore, Chan, Depumpo, Blackberry, Supercell Oy, TeamLab*

**2013-2018:** Adjunct Associate Professor of Computer Science, Brown University, Providence, RI

**2015-2018:** Director of the Modeling and Simulation Graduate Program, University of Central Florida, Orlando, FL

**2015-2018:** Charles N. Millican Faculty Fellow and Associate Professor of Computer Science, University of Central Florida, Orlando, FL

**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**

- 2022:** UCF Research Incentive Award (RIA)
- 2021:** Inducted into the UCF Scroll and Quill Society
- 2021:** ACM IUI 2021 Honorable Mention Paper
- 2019:** Best Paper Award, 7<sup>th</sup> ACM Symposium on Spatial User Interfaces 2019
- 2019:** Keynote speaker at the 7<sup>th</sup> ACM Symposium on Spatial User Interfaces 2019
- 2018:** Appointed as the Charles N. Millican Professor of Computer Science
- 2018:** Promoted to Full Professor in Computer Science at UCF
- 2018:** UCF Scholarship of Teaching and Learning Award (SOTL)
- 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, 8<sup>th</sup> 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, 9<sup>th</sup> 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: \$7,215,801**

**Total as PI: \$5,593,488**

**Total as Co-PI: \$1,622,313**

**My Share at UCF: \$5,498,521**

### Active Grants and Contracts

“DARPA Perceptually-enabled Task Guidance (PTG) Program”, Northrup Grumman Corporation, \$510,692, PI (50% credit equals \$255,346), Jan. 2022 – Nov. 2023.

“FHTCC: DARPA Perceptually-enabled Task Guidance (PTG) Program”, UCF/I-4 Match, \$126,383, PI (50% credit equals \$63,191), Jan. 2022 – Nov. 2023.

“Retraining Built Environment Retrofitting Problem Solving Skills with Augmented Reality”, NSF Award IIS-1917728, \$749,998, Co-PI (25% credit equals \$187,500), Oct. 2019 – Sept. 2022

### Past Grants and Contracts

“Veterans Affairs IPA”, Corporal Michael J Crescenz VA Medical Center, \$43,570, Sole PI (100% credit), Mar. 2020 – Mar. 2022.

“Human-Swarm Interaction for the DARPA OFFSET Program”, Northrup Grumman Corporation, \$712,214, Sole PI (100% credit), Mar. 2018 – Dec. 2021.

“FHTCC: Human-Swarm Interaction for the DARPA OFFSET Program”, UCF/I-4 Match, \$190,808, Sole PI (100% credit), Mar. 2018 – Dec. 2021.

“Augmented Reality-Based Intelligent Tutoring in the Wild”, US Army RDECOM –STC Award W911QX13C0052, \$618,376, Sole PI (100% credit), Dec. 2014 – Sept. 2020.

“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 2020.

“Peraton User Testing”, Peraton, \$80,315, Co-PI (50% credit equals \$40,157), Aug. 2019 – Dec. 2019.

“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 – May 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.

“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, \$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): 12609**

**h-index: 46**

### Books

Kulshreshth, A. and LaViola, J. *Designing Immersive Video Games Using 3DUI Technologies*, Springer, July 2018.

LaViola, J., Kruijff, E., McMahan, R., Bowman, D., and Poupyrev, I. *3D User Interfaces: Theory and Practice*, Second Edition, Addison Wesley, April 2017. (cited 450 times, source: [Google Scholar](#))

Bowman, D., Kruijff, E., LaViola, J., and Poupyrev, I. *3D User Interfaces: Theory and Practice*, Addison Wesley, July 2004. (cited 2263 times, source: [Google Scholar](#))

### Book Chapters

Cheema, S., and LaViola, J. “Using Animation to Enrich Learning Experience in Sketch-Based Physics Tutoring Systems”. *Designing for the User Experience in Learning Systems*, E. Kapros and M. Koutsombogera (eds.), Springer, 201-227, October, 2018.

Vargas, A., Taranta, E., and LaViola, J. “Sketch Based Interaction Techniques for Chart Creation and Manipulation”. *Frontiers in Pen and Touch*, T. Hammond, A. Adler, and M. Prasad (eds.), Springer, 65-82, December 2017.

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

Pfeil, K., Chatlani, N., LaViola, J., and Wisniewski, P. “Bridging the Socio-Technical Gaps in Body-worn Interpersonal Live-Streaming Telepresence through a Critical Review of the Literature”, *Proceedings of the ACM on Human-Computer Interaction*, Vol. 5, No. CSCW1, Article 120 (39 pages), April 2021.

Taranta, E., Pittman, C., Maghoumi, M., Maslych, M., Moolenaar, Y., and LaViola, J. “Machete: Easy, Efficient, and Precise Continuous Custom Gesture Segmentation”, *ACM Transactions of Computer-Human Interaction (TOCHI)*, 28(1): Article 5 (46 pages), January 2021.

Erickson, A., Norouzi, N., Kim, K., Schubert, R., Jules, J., LaViola, J., Bruder, G., and Welch, G. “Sharing Gaze Rays for Visual Target Identification Tasks in Collaborative Augmented Reality”, *Journal of Multimodal User Interfaces*, 14(4):353-371, December 2020.

Erickson, A., Norouzi, N., Kangsoo, K., LaViola, J., Bruder, G., and Welch, G. “Effects of Depth Information on Visual Target Identification Task Performance in Shared Gaze Environments”, *IEEE Transactions of Visualization and Computer Graphics*, 26(5):1934-1944, May 2020.

Vargas, A., Kapalo, K., Koh, S., and LaViola, J. “Exploring the Virtuality Continuum for Complex Rule-Set Education in the Context of Soccer Rule Comprehension”, *Multimodal Technologies and Interaction*, 1(4): Article 30 (15 pages), November 2017.

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 289 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 168 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.

Zeleznik, 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. (cited 125 times, source: [Google Scholar](#))

LaViola, J., and Zeleznik, 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 MathPad<sup>2</sup>: 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 359 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. “MathPad<sup>2</sup>: 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 310 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 530 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 412 times, source: [Google Scholar](#))

LaViola, J. “A Discussion of Cybersickness in Virtual Environments”, *SIGCHI Bulletin* 32(1):47-56, January 2000. (cited 1169 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

Kiran, K., Taranta, E., Ghmandi, R., and LaViola, J. “Automatic Asymmetric Weight Distribution Detection and Correction Utilizing Electrical Muscle Stimulation”, *Proceedings of Graphics Interface 2022*, 13 pages, May 2022.

Taranta, E., Maslych, M., Ghamandi, R., and LaViola, J. “The Voight-Kampff Machine for Automatic Custom Gesture Rejection Threshold Selection”, *Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems (CHI '22)*, Article 556, 15 pages, May 2022.

Masnadi, S., Pfeil, K., Sera-Josef, J., and LaViola, J. “Effects of Field of View on Egocentric Distance Perception in Virtual Reality”, *Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems (CHI '22)*, Article 613, 10 pages, May 2022.

Sermarini, J., Kider, J., LaViola, J., and McConnell, D. “A Kinematic Evaluation of Linear and Parabolic Pointing in Virtual Reality”, *Proceedings of the Human Factors and Ergonomics Society Annual Meeting (HFES 2021)*, 86-90, October 2021.

Sermani, J., Michlowitz, R., LaViola, J., Walters, L., Azevedo, R., and Kider, J. “Embodied Facade Retrofit Design with Augmented Reality in the Built Environment”, *Proceedings of Building Simulation 2021*, 8 pages, September 2021.

Kapalo, K., Pfeil, K., Bonnell, J., and LaViola, J. “Stakeholder Perceptions in the Context of Community Risk Reduction (CRR): Self-reported Hazards as Two-Way Communication Between First Responders and the Communities They Serve”, *Proceedings of the International Conference on Human Computer Interaction (HCII 2021)*, 229-242, July 2021.

Pfeil, K., Kapalo, K., Koh, S., and LaViola, J. “Exploring Human-to-Human Telepresence and the Use of Vibro-Tactile Commands to Guide Human Streamers”, *Proceedings of the International Conference on Human Computer Interaction (HCII 2021)*, 183-202, July 2021.

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Bragdon, A., Zeleznik, R., Williamson, B., Miller, T., and LaViola, J. “GestureBar: Improving the Approachability of Gesture-based Interfaces”, *Proceedings of the 27<sup>th</sup> International Conference on Human Factors in Computing Systems (CHI 2009)*, 2269-2278, April 2009.

Chertoff, D., Byers, R., and LaViola, J. “Evaluation of Menu Techniques Using a 3D Game Input Device”, *Proceedings of the IEEE Symposium on 3D User Interfaces 2009*, 139-140, March 2009.

Charbonneau, E., Miller, A., Wingrave, C., and LaViola, J. “RealDance: An Exploration of 3D Spatial Interfaces for Dancing Games”, *Proceedings of the IEEE Symposium on 3D User Interfaces 2009*, 141-142, March 2009.

Bott, J., Crowley, J., and LaViola, J. “One Man Band: A 3D Gestural Interface for Collaborative Music Creation”, *Proceedings of IEEE VR 2009*, 273-274, March 2009.

Li, C., Zeleznik, R., Miller, T., and LaViola, J. “Online Recognition of Handwritten Mathematical Expressions with Support for Matrices”, *Proceedings of the 19<sup>th</sup> International Conference on Pattern Recognition (ICPR 2008)*, December 2008.

Zeleznik, R., Miller, T., Li, C., and LaViola, J. “MathPaper: Mathematical Sketching with Fluid Support for Interactive Computation”, *Lecture Notes in Computer Science 5166, 8<sup>th</sup> International Symposium on Smart Graphics (SG 2008)*, 20-32, August 2008. (Best Paper Award)

Forsberg, A., Bragdon, A., LaViola, J., Raghupathy, S., and Zeleznik, R. “An Empirical Study in Pen-Centric User Interfaces: Diagramming”, *Proceedings of the Eurographics Workshop on Sketch-Based Interfaces and Modeling 2008*, 135-142, June 2008.

Li, C., Miller, T., Zeleznik, R., and LaViola, J. “AlgoSketch: Algorithm Sketching and Interactive Computation”, *Proceedings of the Eurographics Workshop on Sketch-Based Interfaces and Modeling 2008*, 175-182, June 2008.

LaViola, J., Forsberg, A., Huffman, J., and Bragdon, A. “The Influence of Head Tracking and Stereo on User Performance with Non-Isomorphic 3D Rotation”, *Proceedings of the 14<sup>th</sup> Eurographics Symposium on Virtual Environments*, 111-118, May 2008.

LaViola, J., Leal, A., Miller, T., and Zeleznik, R. “Evaluation of Techniques for Visualizing Mathematical Expression Recognition Results”, *Proceedings of Graphics Interface 2008*, 131-138, May 2008.

LaViola, J., Forsberg, A., Huffman, J., and Bragdon, A. “Effects of Stereo and Head Tracking on Non-Isomorphic 3D Rotation”, *Proceedings of the IEEE Symposium on 3D User Interfaces 2008*, 155-156, March 2008.

Lemmerman, D. and LaViola, J. “An Exploration of Interaction-Display Offset in Surround Screen Virtual Environments”, *Proceedings of the IEEE Symposium on 3D User Interfaces 2007*, 9-15, March 2007.

LaViola, J. and Katzourin, M. “An Exploration of Non-Isomorphic 3D Rotation in Surround Screen Virtual Environments”, *Proceedings of the IEEE Symposium on 3D User Interfaces 2007*, 49-54, March 2007.

Lemmerman, D. and LaViola, J. “Effects of Interaction-Display Offset on User Performance in Surround Screen Virtual Environments”, *Proceedings of IEEE Virtual Reality 2007*, 303-304, March 2007.

LaViola, J. “An Initial Evaluation of a Pen-Based Tool for Creating Dynamic Mathematical Illustrations”, *Proceedings of the Eurographics Workshop on Sketch-Based Interfaces and Modeling 2006*, 157-164, September 2006. (Best Paper Award)

Julier, S. and LaViola, J. “An Empirical Study into the Robustness of Split Covariance Addition (SCA) for Human Motion Tracking”, *Proceedings of the 2004 American Control Conference, IEEE Press*, 2190-2195, June 2004.

LaViola, J., Keefe, D., Acevedo, D., and Zeleznik, R. “Case Studies in Building Custom Input Devices for Virtual Environment Interaction”, *Proceedings of the IEEE VR 2004 Workshop on Beyond Wand and Glove-Based Interaction*, 67-71, March 2004.

LaViola, J. “A Comparison of Unscented and Extended Kalman Filtering for Estimating Quaternion Motion”, *Proceedings of the 2003 American Control Conference*, IEEE Press, 2435-2440, June 2003. (cited 434 times, source: Google Scholar)

LaViola, J. “A Testbed for Studying and Choosing Predictive Tracking Algorithms in Virtual Environments”, *Proceedings of Immersive Projection Technology and Virtual Environments 2003*, ACM Press, 189-198, May 2003.

LaViola, J. “Double Exponential Smoothing: An Alternative to Kalman Filter-Based Predictive Tracking”, *Proceedings of Immersive Projection Technology and Virtual Environments 2003*, ACM Press, 199-206, May 2003. (cited 216 times, source: Google Scholar)

LaViola, J. “An Experiment Comparing Double Exponential Smoothing and Kalman Filter-Based Predictive Tracking Algorithms”, *Proceedings of IEEE Virtual Reality 2003*, 283-284, March 2003.

Zeleznik, R., LaViola, J., Acevedo, D., and Keefe, D. “Pop Through Button Devices for VE Navigation and Interaction”, *Proceedings of IEEE Virtual Reality 2002*, 127-134, March 2002.

LaViola, J., Zeleznik, R., Acevedo, D., and Keefe, D. “Hands-Free Multi-Scale Navigation in Virtual Environments”, *Proceedings of the 2001 Symposium on Interactive 3D Graphics*, 9-15, March 2001. (cited 256 times, source: Google Scholar)

Keefe, D., Acevedo, D., Moscovich, T., Laidlaw, D., and LaViola, J. “CavePainting: A Fully Immersive 3D Artistic Medium and Interactive Experience”, *Proceedings of the 2001 Symposium on Interactive 3D Graphics*, 85-93, March 2001. (cited 326 times, source: Google Scholar)

LaViola, J. “MSVT: A Virtual Reality-Based Multimodal Scientific Visualization Tool”, *Proceedings of the Third IASTED International Conference on Computer Graphics and Imaging*, 1-7, November 2000.

LaViola, J. and Zeleznik, R. “Flex and Pinch: A Case Study of Whole Hand Input Design for Virtual Environment Interaction”, *Proceedings of the Second IASTED International Conference on Computer Graphics and Imaging*, 221-225, October 1999.

LaViola, J. “A Multimodal Interface Framework For Using Hand Gestures and Speech in Virtual Environment Applications”, *Lecture Notes in Artificial Intelligence #1739, Gesture-Based Communication in Human-Computer Interaction*, 303-314, March 1999.

LaViola, J., Holden, L., Forsberg, A., Bhuphaibool, D., and Zeleznik, R. “Collaborative Conceptual Modeling Using the SKETCH Framework”, *Proceedings of the First IASTED International Conference on Computer Graphics and Imaging*, 154-158, June 1998.

Forsberg, A., LaViola, J., and Zeleznik, R. “ErgoDesk: A Framework for Two- and Three-Dimensional Interaction at the ActiveDesk”, *Proceedings of the Second International Immersive Projection Technology Workshop*, Ames, Iowa, May 11-12, 1998.

LaViola, J., Barton, R., Goettsch, A., and Cross, R. “A Real-Time Distributed Virtual Environment for Collaborative Engineering”, *Proceedings of Computer Applications in Production and Engineering (CAPE)*, 712-726, November 1997.

## Panels

Jerald, J., Marks, R., LaViola, J., Murphy, B., Steury, K., and Rubin, A. “The Battle for Motion-Controlled Gaming and Beyond”, *ACM SIGGRAPH 2012*, August 2012.

Jacobson, J., Wingrave, C., Bowman, D., Brooks Jr., F., Jacob, R., LaViola, J., and Rizzo, A. “Reconceptualizing Virtual Reality: What is VR?”, *IEEE Virtual Reality 2010*, 316, March 2010.

LaViola, J., Bowman, D., Ellis, S., Interrante, V., Lok, B., and Swan, J. “User Studies in VR: What Can We Learn From Them and What Are They Good For?”, *IEEE Virtual Reality 2008*, 303-304, March 2008. (Organizer and Panelist)

## Courses and Tutorials

Riecke, B., LaViola, J., and Kruijff, E., “3D User Interfaces for Virtual Reality and Games: 3D Selection, Manipulation, and Spatial Navigation. *ACM SIGGRAPH 2018 Courses*, Vancouver, Canada, Article 13: 94 pages, August 2018.

Jerald, J., LaViola, J. and Marks, R. “VR Interactions”, *ACM SIGGRAPH 2017 Courses*, Los Angeles, CA, Article 19: 105 pages, August 2017.

LaViola, J. “Context Aware 3D Gesture Recognition for Games and Virtual Reality”, *ACM SIGGRAPH 2015 Courses*, Los Angeles, CA, Article 10: 61 pages, August 2015.

LaViola, J. “Introduction to 3D Gestural User Interfaces”, *ACM SIGGRAPH 2014 Courses*, Presented at ACM SIGGRAPH 2014, Vancouver, Canada, Article 25: 42 pages, August 2014.

LaViola, J. and Keefe, D. “3D Spatial Interaction: Applications for Art, Design, and Science”, Course #1, Presented at ACM SIGGRAPH 2011, Vancouver, Canada, August 2011.



LaViola, J. and Marks, R. “An Introduction to 3D Spatial Interaction with Video Game Motion Controllers”, Course #2, Presented at ACM SIGGRAPH 2010, Los Angeles, California, July 2010.

Otaduy, M., Igarashi, T., and LaViola, J. “Interaction: Interfaces, Algorithms, and Applications”, Course #6, Presented at ACM SIGGRAPH 2009, New Orleans, Louisiana, August 2009.

LaViola, J., Kruijff, E., Bowman, D., Poupyrev, I., and Stuerzlinger, W. “3D User Interfaces: Design, Implementation, Usability”, Course #16, Presented at ACM CHI 2009, Boston, Massachusetts, April 2009.

Kruijff, E., Bowman, D., LaViola, J., and Poupyrev, I. “3D User Interfaces: From Lab to Living Room”, Course #17, Presented at ACM CHI 2008, Florence, Italy, April 2008.

LaViola, J., Igarashi, I., Alvarado, C., and Lipson, H. “Sketch-Based Interfaces: Techniques and Applications”, Course #3, Presented at ACM SIGGRAPH 2007, San Diego, California, August 2007.

LaViola, J., Davis, R., and Igarashi, I. “An Introduction to Sketch-Based Interfaces”, Course #18, Presented at ACM SIGGRAPH 2006, Boston, Massachusetts, July 2006.

Bowman, D., LaViola, J., Mine, M., and Poupyrev, I. “Advanced Topics in 3D User Interface Design”, Course #44, Presented at ACM SIGGRAPH 2001, Los Angeles, California, August 2001.

Bowman, D., Kruijff, E., LaViola, J., Mine, M., and Poupyrev, I. “3D User Interface Design: Fundamental Techniques, Theory, and Practice”, Course #36, Presented at ACM SIGGRAPH 2000, New Orleans, Louisiana, July 2000.

Bowman, D., Kruijff, E., LaViola, J., and Poupyrev, I. “The Art and Science of 3D Interaction”, Full-day tutorial presented at IEEE Virtual Reality 2000, New Brunswick, New Jersey, March 2000.

Bowman, D., Kruijff, E., LaViola, J., Mine, M., and Poupyrev, I. “The Art and Science of 3D Interaction”, Full-day tutorial presented at the ACM Symposium on Virtual Reality Software and Technology, London, England, December 1999.

Bowman, D., Kruijff, E., LaViola, J., and Poupyrev, I. “The Art and Science of 3D Interaction”, Full-day tutorial presented at IEEE Virtual Reality '99, Houston, Texas, March 1999.

## **Patents**

Welch, G., LaViola, J., Guido-Sanz, F., Bruder, G., Anderson, M., and Schubert, R. “Adaptive Visual Overlay Wound Simulation”, US Patent 10,854,098, December 2020.

Welch, G., LaViola, J., Guido-Sanz, F., Bruder, G., Anderson, M., and Schubert, R. “Multisensory Wound Simulation”, US Patent 10,803,761, October 2020.

Taranta, E., Maghoumi, M., Pittman, C., and LaViola, J. “Synthetic Generation of Time Series Data”, US Patent 10,133,949, November 2018.

Gulwani, S., Cheema, S., and LaViola, J. “Sketch Beautification of and Completion of Partial Structured Drawings”, US Patent 9,098,191, August 2015.

Gupta, P., Lobo, N., and LaViola, J. “Object Tracking with Opposing Image Capture Devices”, US Patent 8,983,127, March, 2015.

## Other Publications

Masnadi, S., LaViola J., Pavlasek, J., Zhu, X., Desingh, K., Jenkins, O. “Sketching Affordances for Human-in-the-loop Robotic Manipulation Tasks”, *2nd Robot Teammates Operating in Dynamic, Unstructured Environments (RT-DUNE)*, May 2019.

Fiore, S., Song, J., Newton, O., Pittman, C., Warta, S., and LaViola, J. “Determining the Effect of Training on Uncertainty Visualization Evaluations”, *International Conference on Applied Human Factors and Ergonomics 2018*, 141-152, July 2018.

Desingh, K., Maghoubi, M., Jenkins, O., LaViola, J., and Reveret, L. “Object Manipulation in Cluttered Scenes Informed by Physics and Sketching”, *RSS 2016 Workshop: Geometry and Beyond - Representations, Physics, and Scene Understanding for Robotics*, June 2016.

Wingrave, C., Norton, J., and LaViola, J. “Using Minecraft for Instruction and Creative Play”, *CHI 2012 Workshop on Educational Interfaces, Software, and Technology*, May 2012.

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)

Wingrave, C., Hoffman, M., Sottolare, R. and LaViola, J. “Unobtrusive Mood Assessment for Training Applications”, *CHI 2011 Workshop on Brain and Body Interfaces: Designing for Meaningful Interaction*, May 2011.

Bott, J. and LaViola, J. “The WOZ Math Recognizer: A Mathematics Handwriting Recognition Wizard of Oz Tool”, Technical Report CS-TR-11-03, University of Central Florida, Department of Electrical Engineering and Computer Science, Orlando, FL, May 2011.

LaViola, J. “The Killer App for Sketch-Based Interfaces is ...”, *CHI 2010 Workshop on Designing Sketch Recognition Interfaces*, 54-57, April 2010.

Reiter, J., Kirby, R. M., and LaViola, J. “Immersive Hierarchical Visualization and Steering for Spectral/hp Element Methods”, Technical Report CS-01-03, Brown University, Department of Computer Science, Providence RI, May 2001.

LaViola, J. “A Survey of Hand Posture and Gesture Recognition Techniques and Technology”, Technical Report CS-99-11, Brown University, Department of Computer Science, Providence RI, June 1999. (cited 242 times, source: Google Scholar)

Pickering, J., Bhuphaibool, D., LaViola, J., and Pollard, N. “The Coach’s Playbook”, Technical Report CS-99-08, Brown University, Department of Computer Science, Providence RI, May 1999.

Forsberg, A., LaViola, J., and Zeleznik, R. "Incorporating Speech Input into Gesture-Based Graphics Applications at The Brown University Graphics Lab", *CHI'99 Workshop on Designing the User Interface for Pen and Speech Multimedia Applications*, May 1999.

LaViola, J., Forsberg, A., and Zeleznik, R. "Jot: A Framework for Interface Research", IBM's *interVisions Online Magazine*, Issue #11, February 1998.

LaViola, J. "Analysis of Mouse Movement Time Based on Varying Control to Display Ratios Using Fitts' Law", Technical Report CS-97-17, Brown University, Department of Computer Science, Providence RI, October 1997.

LaViola, J. "Experiment in VM Reduction, Conversion of Site Operating Procedures to the World Wide Web", IBM Technical Report, TR54.922, December 29, 1995.

## **STUDENT ADVISING**

### **Post-Doc:**

Chadwick Wingrave (2008 – 2012)

### **PhD**

Ryan Ghamandi, started Fall 2021

Mykola Maslych, started Fall 2021

Jacob Belga, started Fall 2020

Sina Masnadi, started Fall 2017

Ravikiran Kattoju, Ph.D. 2022. Dissertation Title: Automatic Posture Correction Utilizing Electrical Muscle Stimulation

Kevin Pfeil, Ph.D. 2022. Dissertation Title: Balancing User Experience for Mobile One-to-One Interpersonal Telepresence

Andres Vargas, started Fall 2014

Corey Pittman, Ph.D. 2021. Dissertation Title: Evaluating Augmented Reality Tools for Physics Education.

Kate Kapalo, Ph.D. 2020. Dissertation Title: Reducing Information Overload in Situated Visualization For Firefighting: A Human Factors Evaluation of User Interface Prototypes for Displaying Pre-Incident Planning Information

Mehran Maghoubi, Ph.D. 2020. Dissertation Title: Deep Recurrent Networks For Gesture Recognition and Synthesis

Eugene Taranta, Ph.D. 2020. Dissertation Title: The Dollar General: Continuous Custom Gesture Recognition Techniques at Everyday Low Prices

Seng Lee Koh, Ph.D. 2018. Dissertation Title: Exploring Natural User Abstractions For Shared Perceptual Manipulator Task Modeling and Recovery

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:**

Jack Oakley, M.S., 2020, Thesis Title: The Effects of Gesture Presentation in Video Games

Samuel Cosgrove, M.S., 2020, Thesis Title: Navigating Immersive and Interactive VR Environments with Connected 360 Degree Panoramas

Chuck Greenwood, M.S., 2019, Thesis Title: Realtime Editing in Virtual Reality of Room Scale Scans

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:**

Pauline Johnson, M.S., Computer Science, 2022

Joshua Nelson, Ph.D., Industrial Engineering and Management Systems, 2020

Enes Karaaslan, Ph.D., Civil, Environmental, and Construction Engineering, 2019

Saif Alabachi, Ph.D., Electrical and Computer Engineering, 2019

Jason Hochreiter, Ph.D., Computer Science, 2019

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

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

Yiyan 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

<b>Course Number</b>	<b>Course Title</b>	<b>Credits</b>	<b>Class</b>	<b>Semester</b>	<b># of Students</b>	<b>Students Eval Score (out of 5)</b>
CAP 6121*	3D User Interfaces for Games and Virtual Reality	3	Grad	Spring 2022	18	4.55
COP 3503H	Honors Computer Science II	3	Ugrad	Fall 2021	14	3.0
CAP 6121*	3D User Interfaces for	3	Grad	Spring 2021	8	4.0

	Games and Virtual Reality					
COP 3503H	Honors Computer Science II	3	Ugrad	Fall 2020	25	3.23
CAP 6121*	3D User Interfaces for Games and Virtual Reality	3	Grad	Spring 2020	7	2.67
COP 3503H	Honors Computer Science II	3	Ugrad	Fall 2019	12	2.5
CAP 6121*	3D User Interfaces for Games and Virtual Reality	3	Grad	Spring 2019	12	4.5
COP 3503H	Honors Computer Science II	3	Ugrad	Fall 2018	13	3.5
CAP 6121*	3D User Interfaces for Games and Virtual Reality	3	Grad	Spring 2018	10	3.75
COP 3503H	Honors Computer Science II	3	Ugrad	Fall 2017	17	3.17
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	3	Ugrad	Fall 2011	168	3.18

	with C					
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

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

“Gesture Recognition: Key Insights and Future Directions”

- Brown University, Providence, RI (November 2019)
- Seventh ACM Symposium on Spatial User Interfaces, New Orleans, LA (October 2019)

“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 14<sup>th</sup> 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:** ACM Transactions on Interactive Intelligent Systems (2013-present)  
 International Journal of Human-Computer Studies (2010-present)  
 IEEE Computer Graphics & Applications (2013-2018)

**NSF Panelist:** Computer & Information Science & Engineering Directorate (April 2019)  
 Computer & Information Science & Engineering Directorate (January 2018)  
 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, 2018)  
ACM Virtual Reality Software and Technology (2009-2010)  
ACM Intelligent User Interfaces (2009, 2020)  
Eurographics Short Papers Program (2008)  
IEEE Symposium on 3D User Interfaces (2007-2009, 2014, 2017)  
IEEE Virtual Reality (2007-2011, 2014)  
IEEE AIVR (2019,2020)  
Eurographics Symposium on Sketch-Based Interfaces and Modeling (2007-2008, 2011, 2012, 2013, 2014, 2017)  
6<sup>th</sup> IEEE International Symposium on Mixed and Augmented Reality (2007)  
2<sup>nd</sup> International Symposium on Visual Computing (2006)

**Journal Reviewer:** *ACM Transactions on Human Robot Interaction* (2021)  
*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* (2010-2011,2020)  
*Journal of Visual Languages and Computing* (2009)  
*ACM Transactions on Computer-Human Interaction* (2009, 2014, 2019)  
*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, 2018)  
*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, 2019, 2021, 2022)  
*IEEE Transactions on Robotics* (2005)  
*Virtual Reality* (2005, 2010, 2012)  
*Pattern Recognition Letters* (2005)  
*IEEE Transactions on Cognitive and Developmental Systems* (2020)  
*IEEE Transactions on Learning Technologies* (2021)  
*ACM Computing Surveys* (2021)

**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 – 2019, 2021, 2022)  
ACM CHI (2005-2006, 2010-2022)  
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, 2020, 2022)  
IEEE Visualization (2004, 2021)  
ACM SIGGRAPH (2004, 2008, 2010, 2011, 2013, 2014, 2017-2019)  
12<sup>th</sup> 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, 2021)  
ACM Symposium on Interactive 3D Graphics (2003)  
ACM SIGGRAPH courses (1999)

## **SERVICE TO UCF**

Member, Department of Computer Science Executive Committee, 2018-2022  
Member, Department of Computer Science Graduate Committee, 2020-2022  
Chair, Faculty Search Committee, CS, 2019  
Member, University Promotion and Tenure Committee, 2019-2020  
Member, SOTL Review Committee, UCF, 2017  
Member, Faculty Search Committee, Modeling and Simulation Graduate Program, 2016  
Director, Modeling and Simulation Graduate Program, UCF, 2015-2018  
Member, SOTL Review Committee, UCF, 2014  
Member, TIP Criteria Committee, CECS, 2014  
Member, Faculty Search Committee, EECS, 2013-2016, 2018  
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

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