

University of Central Florida
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RYAN P. McMAHAN

ASSOCIATE PROFESSOR

HIGHER EDUCATION

- **Ph.D. in Computer Science and Applications** Dec 2011
Virginia Tech Blacksburg, VA
 - Thesis: “Exploring the Effects of Higher-Fidelity Display and Interaction for Virtual Reality Games”
 - Advisor: Dr. Doug A. Bowman
- **M.S. in Computer Science and Applications** Jun 2007
Virginia Tech Blacksburg, VA
 - Thesis: “Exploring and Evaluating Task Sequences for System Control Interfaces in Immersive Virtual Environments”
 - Advisor: Dr. Doug A. Bowman
- **B.S. in Computer Science** May 2004
Virginia Tech Blacksburg, VA
 - Graduated magna cum laude
 - Minor in Mathematics

PRIMARY APPOINTMENTS

- **Associate Professor (tenured), Computer Science** Aug 2019 – Present
Univeristy of Central Florida Orlando, FL
- **Associate Professor (tenured), Computer Science** Sep 2018 – Aug 2019
Univeristy of Texas at Dallas Richardson, TX
- **Assistant Professor, Computer Science** Aug 2012 – Aug 2018
Univeristy of Texas at Dallas Richardson, TX

JOINT APPOINTMENTS

- **Associate Professor, Learning Sciences** Nov 2020 – Present
Univeristy of Central Florida Orlando, FL
- **Associate Professor, Arts, Technology, and Emerging Communication** Sep 2018 – Aug 2019
Univeristy of Texas at Dallas Richardson, TX
- **Assistant Professor, Arts, Technology, and Emerging Communication** Oct 2013 – Aug 2018
Univeristy of Texas at Dallas Richardson, TX
- **Adjunct Assistant Professor, Anesthesiology** Aug 2012 – Jul 2014
Duke University Durham, NC

OTHER EXPERIENCE

- **Postdoctoral Associate, Pratt School of Engineering** Feb 2012 – Jul 2012
Duke University Durham, NC
- **Research Assistant, Institute of Distance and Distributed Learning** Aug 2008 – Jan 2012
Virginia Tech Blacksburg, VA
- **Research Assistant, Virginia Center for Coal and Energy Research** Jan 2006 – Aug 2008
Virginia Tech Blacksburg, VA
- **Teaching Assistant, Computer Science** Aug 2004 – May 2005
Virginia Tech Blacksburg, VA

HONORS AND AWARDS

- **Excellence in Graduate Teaching Award** Apr 2023
College of Engineering and Computer Science, University of Central Florida
- **NSF CAREER Award** Sep 2016
Human-Centered Computing, National Science Foundation
- **Provost's Award for Faculty Excellence in Undergraduate Research Mentoring** May 2016
University of Texas at Dallas
- **Outstanding Faculty Teaching Award** May 2016
Erik Jonsson School of Engineering and Computer Science, University of Texas at Dallas
- **Internet of Things (IoT) Technology Research Award** Apr 2016
Google Research
- **First Place Award, Virtual Student Center Design Competition** May 2008
Virginia Tech
- **Outstanding Master's Thesis Award** May 2007
Department of Computer Science, Virginia Tech
- **First Place Industry Choice Award, Undergraduate Research Symposium** Apr 2004
Virginia Tech
- **Valedictorian** May 2001
Marion Senior High School (Marion, VA)

PROFESSIONAL MEMBERSHIPS

- American Society for Engineering Education (ASEE)
- Association for Computing Machinery (ACM)
 - Special Interest Group on Computer-Human Interaction (SIGCHI)
 - Special Interest Group on Computer Graphics and Interactive Techniques (SIGGRAPH)
- Institute of Electrical and Electronics Engineers (IEEE)
 - IEEE Computer Society

RESEARCH INTERESTS

- Extended Reality (XR), Virtual Reality (VR), Augmented Reality (AR), and 3D User Interfaces (3DUIs)
- Human-Computer Interaction (HCI) and User Experience (UX) Engineering
- Cyberlearning, Education, and Training

RESEARCH FUNDING

FUNDING SUMMARY

- Total Awarded Funding: **\$3,428,613**; Total Awarded Credit: **\$2,371,896**
- Total Projected* Funding: **\$4,073,992**; Total Projected* Credit: **\$2,630,047**

*See **Options** for Externally Awarded Grants below.

EXTERNALLY AWARDED GRANTS

- **National Science Foundation, IIS #2302816** **\$499,673**
Collaborative Research: Advancing Quantum Education by Adaptively Addressing Misconceptions in Virtual Reality. Aug 2023 – Jul 2026
PIs: **Ryan P. McMahan (95% credit)**
- **Northrop Grumman Corporation** **\$1,052,648**
DARPA Perceptually-enabled Task Guidance (PTG) Program. Jan 2022 – Nov 2025
PIs: Joseph J. LaViola, **Ryan P. McMahan (50% credit)**
- **U.S. Army Research Laboratory - Orlando** **\$387,776**
Multimodal Team-Performance Models for Assessing and Influencing Team-Dimension Competencies in Virtual Reality. Sep 2023 – Sep 2024
PIs: **Ryan P. McMahan (40% credit)**, Joseph J. LaViola, Roger Azevedo
Options: Year 2—\$314,317; Year 3—\$331,062
- **Northrop Grumman Corporation** **\$141,108**
DARPA Situational Awareness Virtual Environment (SAVE). Sep 2023 – Sep 2024
PIs: **Ryan P. McMahan (50% credit)**, Joseph J. LaViola
- **National Science Foundation, IIS #2232448** **\$115,965**
CCRI: Planning-C: Capturing and Logging Ecological Virtual Experiences and Reality (CLEVER). May 2023 – Apr 2024
PIs: **Ryan P. McMahan (100% credit)**
- **National Science Foundation, CNS #2120240** **\$77,922**
Collaborative Research: CCRI: Planning: InfraStructure for Photorealistic Image and Environment Synthesis (I-SPIES). Oct 2021 – Sep 2023
PIs: **Ryan P. McMahan (45% credit)**, Charles E. Hughes, Lori C. Walters
- **National Science Foundation, IIS #2021607** **\$289,194**
CAREER: Leveraging the Virtualness of Virtual Reality for More-Effective Training. Aug 2019 – Aug 2023
PIs: **Ryan P. McMahan (100% credit)**

- **The Swift Family Foundation** **\$11,000**
 RF: Development and Evaluation of a Newborn Augmented Reality (AR) Scenario for Nursing Incorporating Diversity. Apr 2022 – Oct 2022
 PIs: Mindi Anderson, Desiree A. Díaz, **Ryan P. McMahan (5% credit)**
- **National Science Foundation, IIS #1552344** **\$270,994**
 CAREER: Leveraging the Virtualness of Virtual Reality for More-Effective Training. Sep 2016 – Aug 2019
 PIs: **Ryan P. McMahan (100% credit)**
- **Intuitive Surgical Operations, Inc.** **\$101,071**
 A Portable, Full-Body, Virtual Reality Training System for Non-Surgeon da Vinci Team Members. Jan 2016 – Jun 2018
 PIs: **Ryan P. McMahan (100% credit)**
- **iPerform Industry-University Cooperative Research Center** **\$80,000**
 Virtual Reality for Safety Training. Jan 2015 – Dec 2017
 PIs: **Ryan P. McMahan (100% credit)**
- **Oak Ridge National Laboratory (ORNL)** **\$68,373**
 VR Collaboration with CASL's Virtual Office Community and Computing (VOCC) Laboratory. Jan 2014 – May 2015
 PIs: **Ryan P. McMahan (100% credit)**

INTERNALLY AWARDED GRANTS

- **University of Central Florida, Florida High Tech Corridor Council** **\$126,383**
 FHTCC: DARPA Perceptually-enabled Task Guidance (PTG) Program - Year 2. Mar 2023 – Sep 2024
 PIs: Joseph J. LaViola, **Ryan P. McMahan (50% credit)**
- **University of Central Florida, Florida High Tech Corridor Council** **\$126,383**
 FHTCC: DARPA Perceptually-enabled Task Guidance (PTG) Program - Year 1. Jan 2022 – Nov 2023
 PIs: Joseph J. LaViola, **Ryan P. McMahan (50% credit)**
- **University of Central Florida, Technology Fee Program** **\$45,000**
 A Mixed Reality Library to Enhance Instructional Technology Resources for Students and Faculty. May 2022 – May 2023
 PIs: **Ryan P. McMahan (50% credit)**, Joseph J. LaViola

AWARDED GIFTS

- **Google Research** **\$1,500**
 IoT Browser. Equipment gift.. Apr 2016
 PIs: **Ryan P. McMahan (100% credit)**
- **Samsung Research America – Dallas** **\$28,008**
 Mobile Virtual Reality Course. Equipment gift.. Apr 2016
 PIs: **Ryan P. McMahan (100% credit)**
- **T. Boone Pickens Foundation** **\$5,615**
 Haptic Sleeve Project. Monetary gift.. Jul 2013
 PIs: **Ryan P. McMahan (100% credit)**

OUTPUT SUMMARY

- Google Scholar Profile: scholar.google.com/citations?user=inGtCcMAAAAJ
- Total Citations: **5000+**; h-index: **26**; i10-index: **49**
- Citations Since 2018: **3700+**; h-index: **23**; i10-index: **42**

THESES

- [1] **Ryan P. McMahan**. *Exploring the Effects of Higher-Fidelity Display and Interaction for Virtual Reality Games*. Ph.D. dissertation, Computer Science and Applications, Virginia Tech. Dec. 2011.
- [2] **Ryan P. McMahan**. *Exploring and Evaluating Task Sequences for System Control Interfaces in Immersive Virtual Environments*. M.S. thesis, Computer Science and Applications, Virginia Tech. June 2007.

BOOKS AUTHORED

- [1] Joseph J. LaViola, Ernst Kruijff, **Ryan P. McMahan**, Doug A. Bowman, and Ivan Poupyrev. *3D User Interfaces: Theory and Practice*. 2nd ed. Boston: Addison-Wesley Professional, 2017. ISBN: 978-0134034324.

BOOK CHAPTERS

- [1] **Ryan P. McMahan**. “Virtual Reality System Fidelity”. In: *Encyclopedia of Computer Graphics and Games*. Ed. by Newton Lee. Cham: Springer, 2018, pp. 1–8. DOI: [10.1007/978-3-319-08234-9_251-1](https://doi.org/10.1007/978-3-319-08234-9_251-1).
- [2] **Ryan P. McMahan**, Regis Kopper, and Doug A. Bowman. “Principles for Designing Effective 3D Interaction Techniques”. In: *Handbook of Virtual Environments: Design, Implementation, and Applications*. Ed. by Kelly S. Hale and Kay M. Stanney. 2nd ed. Boca Raton: CRC Press, 2014, pp. 299–325. DOI: [10.1201/b17360](https://doi.org/10.1201/b17360).
- [3] **Ryan P. McMahan**, Steven Schafrik, Doug A. Bowman, and Michael Karmis. “Virtual Environments for Surface Mining Powered Haulage Training”. In: *Extracting the Science: A Century of Mining Research*. Ed. by Jürgen Brune. Littleton, Colorado, USA: Society for Mining, Metallurgy, and Exploration (SME), 2010, pp. 520–528. ISBN: 978-0873353229.

PATENTS ISSUED

- [1] Gregory Welch, **Ryan P. McMahan**, and Gerd Bruder. *Grammar Dependent Tactile Pattern Invocation*. US Patent 11,550,470 B2. 2023.
- [2] Gregory Welch, **Ryan P. McMahan**, and Gerd Bruder. *Visual-Tactile Virtual Telepresence*. US Patent 11,287,971 B1. 2022.
- [3] Gregory Welch, **Ryan P. McMahan**, and Gerd Bruder. *Low Latency Tactile Telepresence*. US Patent 11,106,357 B1. 2021.

HIGH IMPACT JOURNAL ARTICLES (IMPACT FACTOR > 3.0)

[†] Graduate advisee

⁺ Undergraduate advisee

[⊥] High school advisee

- [1] Chengyuan Lai[†], Xinyu Hu[†], Afham Ahmed Aiyaz⁺, Ann Segismundo[⊥], Ananya Phadke[⊥], and **Ryan P. McMahan**. “The Cognitive Loads and Usability of Target-based and Steering-based Travel Techniques”. In: *IEEE Transactions on Visualization and Computer Graphics (TVCG)* 27.11 (2021). Impact factor: 5.226, pp. 4289–4299. DOI: [10.1109/TVCG.2021.3106507](https://doi.org/10.1109/TVCG.2021.3106507).

- [2] Shanthi Vellingiri[†], **Ryan P. McMahan**, and Balakrishnan Prabhakaran. “SCeVE: A Component-Based Framework to Author Mixed Reality Tours”. In: *ACM Transactions on Multimedia Computing, Communications, and Applications (TOMM)* 16.2 (2020). Impact factor: 4.094, 40:1–23. DOI: [10.1145/3377353](https://doi.org/10.1145/3377353).
- [3] Animesh Tandon, Barbara E.U. Burkhardt, Maria Batsis, Thomas M. Zellers, Mari Nieves Velasco Forte, Israel Valverde, **Ryan P. McMahan**, Kristine J. Guleserian, Gerald F. Greil, and Tarique Hussain. “Sinus Venosus Defects: Anatomic Variants and Transcatheter Closure Feasibility Using Virtual Reality Planning”. In: *JACC: Cardiovascular Imaging* 12.5 (2019). Impact factor: 16.051, pp. 921–924. DOI: [10.1016/j.jcmg.2018.10.013](https://doi.org/10.1016/j.jcmg.2018.10.013).
- [4] Alec G. Moore[†], John G. Hatch⁺, Stephen Kuehl⁺, and **Ryan P. McMahan**. “VOTE: A Ray-Casting Study of Vote-Oriented Technique Enhancements”. In: *International Journal of Human-Computer Studies (IJHCS)* 120 (2018). Impact factor: 4.866, pp. 36–48. DOI: [10.1016/j.ijhcs.2018.07.003](https://doi.org/10.1016/j.ijhcs.2018.07.003).
- [5] Kanchan Bahirat[†], Chengyuan Lai[†], **Ryan P. McMahan**, and Balakrishnan Prabhakaran. “Designing and Evaluating a Mesh Simplification Algorithm for Virtual Reality”. In: *ACM Transactions on Multimedia Computing, Communications, and Applications (TOMM)* 14.3s (2018). Impact factor: 4.094, 63:1–26. DOI: [10.1145/3209661](https://doi.org/10.1145/3209661).
- [6] Eric D. Ragan, Doug A. Bowman, Regis Kopper, Cheryl Stinson, Siroberto Scerbo, and **Ryan P. McMahan**. “Effects of Field of View and Visual Complexity on Virtual Reality Training Effectiveness for a Visual Scanning Task”. In: *IEEE Transactions on Visualization and Computer Graphics (TVCG)* 21.7 (2015). Impact factor: 5.226, pp. 794–807. DOI: [10.1109/TVCG.2015.2403312](https://doi.org/10.1109/TVCG.2015.2403312).
- [7] Doug A. Bowman, **Ryan P. McMahan**, and Eric D. Ragan. “Questioning Naturalism in 3D User Interfaces”. In: *Communications of the ACM (CACM)* 55.9 (2012). Impact factor: 14.065, pp. 78–88. DOI: [10.1145/2330667.2330687](https://doi.org/10.1145/2330667.2330687).
- [8] **Ryan P. McMahan**, Doug A. Bowman, David J. Zielinski, and Rachael B. Brady. “Evaluating Display Fidelity and Interaction Fidelity in a Virtual Reality Game”. In: *IEEE Transactions on Visualization and Computer Graphics (TVCG)* 18.4 (2012). Impact factor: 5.226, pp. 626–633. DOI: [10.1109/TVCG.2012.43](https://doi.org/10.1109/TVCG.2012.43).
- [9] Tao Ni, Doug A. Bowman, Chris North, and **Ryan P. McMahan**. “Design and Evaluation of Freehand Menu Selection Interfaces Using Tilt and Pinch Gestures”. In: *International Journal of Human-Computer Studies (IJHCS)* 69.9 (2011). Impact factor: 4.866, pp. 551–562. DOI: [10.1016/j.ijhcs.2011.05.001](https://doi.org/10.1016/j.ijhcs.2011.05.001).
- [10] Regis Kopper, Doug A. Bowman, Mara G. Silva, and **Ryan P. McMahan**. “A Human Motor Behavior Model for Distal Pointing Tasks”. In: *International Journal of Human-Computer Studies (IJHCS)* 68.10 (2010). Impact factor: 4.866, pp. 603–615. DOI: [10.1016/j.ijhcs.2010.05.001](https://doi.org/10.1016/j.ijhcs.2010.05.001).
- [11] Doug A. Bowman and **Ryan P. McMahan**. “Virtual Reality: How Much Immersion Is Enough?” In: *IEEE Computer* 40.7 (2007). Impact factor: 4.419, pp. 36–43. DOI: [10.1109/MC.2007.257](https://doi.org/10.1109/MC.2007.257).

OTHER JOURNAL ARTICLES

[†] Graduate advisee

- [1] Tiffany D. Do[†], Steve Zelenty[†], Mar Gonzalez-Franco, and **Ryan P. McMahan**. “VALID: a perceptually validated Virtual Avatar Library for Inclusion and Diversity”. In: *Frontiers in Virtual Reality* 4 (2023), 1248915:1–15. DOI: [10.3389/frvir.2023.1248915](https://doi.org/10.3389/frvir.2023.1248915).
- [2] Shanthi Vellingiri[†], **Ryan P. McMahan**, Vinu Johnson, and Balakrishnan Prabhakaran. “An Augmented Virtuality System Facilitating Learning Through Nature Walk”. In: *Multimedia Tools and Applications (MTAP)* 82.1 (2023), pp. 1553–1564. DOI: [10.1007/s11042-022-13379-w](https://doi.org/10.1007/s11042-022-13379-w).

- [3] Mindi Anderson, Frank Guido-Sanz, Steve Talbert, Christopher W. Blackwell, Marci Dial, **Ryan P. McMahan**, and Desiree A. Díaz. “Augmented Reality (AR) as a Prebrief for Acute Care Simulation”. In: *Clinical Simulation in Nursing (CSN)* 69 (2022), pp. 40–48. DOI: [10.1016/j.ecns.2022.05.005](https://doi.org/10.1016/j.ecns.2022.05.005).
- [4] Alec G. Moore[†], **Ryan P. McMahan**, and Nicholas Ruoizzi. “Exploration of Feature Representations for Predicting Learning and Retention Outcomes in a VR Training Scenario”. In: *Big Data and Cognitive Computing (BDCC)* 5.3 (2021), 29:1–17. DOI: [10.3390/bdcc5030029](https://doi.org/10.3390/bdcc5030029).
- [5] James Coleman Eubanks[†], Alec G. Moore[†], Paul A. Fishwick, and **Ryan P. McMahan**. “A Preliminary Embodiment Short Questionnaire”. In: *Frontiers in Virtual Reality* 2 (2021), 647896:1–15. DOI: [10.3389/frvir.2021.647896](https://doi.org/10.3389/frvir.2021.647896).
- [6] Fei Tang[†] and **Ryan P. McMahan**. “The Syncopated Energy Algorithm for Rendering Real-Time Tactile Interactions”. In: *Frontiers in ICT* 6 (2019), 19:1–16. DOI: [10.3389/fict.2019.00019](https://doi.org/10.3389/fict.2019.00019).
- [7] Gary M. Hardee[†] and **Ryan P. McMahan**. “FIJI: A Framework for the Immersion-Journalism Intersection”. In: *Frontiers in ICT* 4 (2017), 21:1–18. DOI: [10.3389/fict.2017.00021](https://doi.org/10.3389/fict.2017.00021).
- [8] Michael J. Howell[†], Nicolas S. Herrera[†], Alec G. Moore[†], and **Ryan P. McMahan**. “A Reproducible Olfactory Display for Exploring Olfaction in Immersive Media Experiences”. In: *Multimedia Tools and Applications (MTAP)* 75 (2016), pp. 12311–12330. DOI: [10.1007/s11042-015-2971-0](https://doi.org/10.1007/s11042-015-2971-0).
- [9] **Ryan P. McMahan** and Nicolas S. Herrera[†]. “AFFECT: Altered-Fidelity Framework for Enhancing Cognition and Training”. In: *Frontiers in ICT* 3 (2016), 29:1–15. DOI: [10.3389/fict.2016.00029](https://doi.org/10.3389/fict.2016.00029).
- [10] **Ryan P. McMahan**, Eric D. Ragan, Anamary Leal, Robert J. Beaton, and Doug A. Bowman. “Considerations for the Use of Commercial Video Games in Controlled Experiments”. In: *Entertainment Computing (EntCom)* 2.1 (2011), pp. 3–9. DOI: [10.1016/j.entcom.2011.03.002](https://doi.org/10.1016/j.entcom.2011.03.002).

HIGHLY SELECTIVE CONFERENCE PAPERS (ACCEPTANCE RATES < 30%)

[†] Graduate advisee

+ Undergraduate advisee

[‡] High school advisee

- [1] Jacob Belga[†], Tiffany D. Do[†], Ryan Ghamandi, **Ryan P. McMahan**, and Joseph J. LaViola. “Carousel: Improving the Accuracy of Virtual Reality Assessments for Inspection Training Tasks”. In: *ACM Symposium on Virtual Reality Software and Technology (VRST)*. Acceptance rate: 26.7%. Tsukuba, Japan: ACM, Nov. 2022, pp. 1, 1–10. DOI: [10.1145/3562939.3565618](https://doi.org/10.1145/3562939.3565618).
- [2] Tiffany D. Do[†], **Ryan P. McMahan**, and Pamela J. Wisniewski. “A New Uncanny Valley? The Effects of Speech Fidelity and Human Listener Gender on Social Perceptions of a Virtual-Human Speaker”. In: *ACM Conference on Human Factors in Computing Systems (CHI)*. Acceptance rate: 24.7%. New Orleans, LA, USA: ACM, Apr. 2022, 424:1–11. DOI: [10.1145/3491102.3517564](https://doi.org/10.1145/3491102.3517564).
- [3] Esteban Segarra Martinez[†], Annie S. Wu, and **Ryan P. McMahan**. “Research Trends in Virtual Reality Locomotion Techniques”. In: *IEEE Conference on Virtual Reality and 3D User Interfaces (VR)*. Acceptance rate: 21.5%. Christchurch, New Zealand: IEEE, Mar. 2022, pp. 270–280. DOI: [10.1109/VR51125.2022.00046](https://doi.org/10.1109/VR51125.2022.00046).
- [4] Alec G. Moore[†], **Ryan P. McMahan**, Hailiang Dong, and Nicholas Ruoizzi. “Personal Identifiability and Obfuscation of User Tracking Data From VR Training Sessions”. In: *IEEE International Symposium on Mixed and Augmented Reality (ISMAR)*. Acceptance rate: 23.6%. Bari, Italy: IEEE, Nov. 2021, pp. 221–228. DOI: [10.1109/ISMAR52148.2021.00037](https://doi.org/10.1109/ISMAR52148.2021.00037).
- [5] James Coleman Eubanks[†], Alec G. Moore[†], Paul A. Fishwick, and **Ryan P. McMahan**. “The Effects of Body Tracking Fidelity on Embodiment of an Inverse-Kinematic Avatar for Male Participants”. In: *IEEE International Symposium on Mixed and Augmented Reality (ISMAR)*. Acceptance rate: 22.8%. Recife/Porto de Galinhas, Brazil: IEEE, Nov. 2020, pp. 54–63. DOI: [10.1109/ISMAR50242.2020.00025](https://doi.org/10.1109/ISMAR50242.2020.00025).

- [6] Tiffany D. Do[†], Joseph J. LaViola, and **Ryan P. McMahan**. “The Effects of Object Shape, Fidelity, Color, and Luminance on Depth Perception in Handheld Mobile Augmented Reality”. In: *IEEE International Symposium on Mixed and Augmented Reality (ISMAR)*. Acceptance rate: 22.8%. Recife/Porto de Galinhas, Brazil: IEEE, Nov. 2020, pp. 64–72. DOI: [10.1109/ISMAR50242.2020.00026](https://doi.org/10.1109/ISMAR50242.2020.00026).
- [7] Alec G. Moore[†], **Ryan P. McMahan**, Hailiang Dong, and Nicholas Ruoizzi. “Extracting Velocity-Based User-Tracking Features to Predict Learning Gains in a Virtual Reality Training Application”. In: *IEEE International Symposium on Mixed and Augmented Reality (ISMAR)*. Acceptance rate: 22.8%. Recife/Porto de Galinhas, Brazil: IEEE, Nov. 2020, pp. 694–703. DOI: [10.1109/ISMAR50242.2020.00099](https://doi.org/10.1109/ISMAR50242.2020.00099).
- [8] Chengyuan Lai[†] and **Ryan P. McMahan**. “The Cognitive Load and Usability of Three Walking Metaphors for Consumer Virtual Reality”. In: *IEEE International Symposium on Mixed and Augmented Reality (ISMAR)*. Acceptance rate: 22.8%. Recife/Porto de Galinhas, Brazil: IEEE, Nov. 2020, pp. 627–638. DOI: [10.1109/ISMAR50242.2020.00091](https://doi.org/10.1109/ISMAR50242.2020.00091).
- [9] Alec G. Moore[†], Marwan Kodeih⁺, Anoushka Singhanian⁺, Angelina Wu⁺, Tassneen Bashir⁺, and **Ryan P. McMahan**. “The Importance of Intersection Disambiguation for Virtual Hand Techniques”. In: *IEEE International Symposium on Mixed and Augmented Reality (ISMAR)*. Acceptance rate: 22.1%. Beijing, China: IEEE, Oct. 2019, pp. 310–317. DOI: [10.1109/ISMAR.2019.00029](https://doi.org/10.1109/ISMAR.2019.00029).
- [10] Kanchan Bahirat[†], Chengyuan Lai[†], **Ryan P. McMahan**, and Balakrishnan Prabhakaran. “A Boundary and Texture Preserving Mesh Simplification Algorithm for Virtual Reality”. In: *ACM Multimedia Systems Conference (MMSys)*. Acceptance rate: 28%. Taipei, Taiwan: ACM, June 2017, pp. 50–61. DOI: [10.1145/3083187.3083188](https://doi.org/10.1145/3083187.3083188).
- [11] Asma Naz[†], Regis Kopper, **Ryan P. McMahan**, and Mihai Nadin. “Emotional Qualities of VR Space”. In: *IEEE Virtual Reality (VR)*. Acceptance rate: 22.4%. Los Angeles, CA, USA: IEEE, Mar. 2017, pp. 3–11. DOI: [10.1109/VR.2017.7892225](https://doi.org/10.1109/VR.2017.7892225).
- [12] David J. Zielinski, **Ryan P. McMahan**, and Rachael B. Brady. “Shadow Walking: An Unencumbered Locomotion Technique for Systems with Under-floor Projection”. In: *IEEE Virtual Reality Conference (VR)*. Acceptance rate: 16%. Singapore: IEEE, Mar. 2011, pp. 167–170. DOI: [10.1109/VR.2011.5759456](https://doi.org/10.1109/VR.2011.5759456).
- [13] Tao Ni, **Ryan P. McMahan**, and Doug A. Bowman. “Tech-note: rapMenu: Remote Menu Selection Using Freehand Gestural Input”. In: *IEEE Symposium on 3D User Interfaces (3DUI)*. Acceptance rate: 23%. Reno, NV, USA: IEEE, Mar. 2008, pp. 55–58. DOI: [10.1109/3DUI.2008.4476592](https://doi.org/10.1109/3DUI.2008.4476592).

OTHER REFEREED CONFERENCE PAPERS

[†] Graduate advisee + Undergraduate advisee

- [1] Tiffany D. Do[†], Mamtaj Akter, Zubin Choudhary, Roger Azevedo, and **Ryan P. McMahan**. “The Effects of an Embodied Pedagogical Agent’s Synthetic Speech Accent on Learning Outcomes”. In: *ACM International Conference on Multimodal Interaction (ICMI)*. Acceptance rate: 33.3%. Bengaluru, India: ACM, Nov. 2022, pp. 198–206. DOI: [10.1145/3536221.3556587](https://doi.org/10.1145/3536221.3556587).
- [2] Esteban Segarra Martinez[†], Stephen V. Maldonado, Annie S. Wu, **Ryan P. McMahan**, Xinliang Liu, and Blake Oakley. “Effects of Imputation Strategy on Genetic Algorithms and Neural Networks on a Binary Classification Problem”. In: *ACM Genetic and Evolutionary Computation Conference (GECCO)*. Boston, MA, USA: ACM, July 2022, pp. 1272–1280. DOI: [10.1145/3512290.3528863](https://doi.org/10.1145/3512290.3528863).
- [3] Tiffany D. Do[†], Seong Ioi Wang, Dylan S. Yu, Matthew G. McMillian, and **Ryan P. McMahan**. “Using Machine Learning to Predict Game Outcomes Based on Player-Champion Experience in League of Legends”. In: *International Conference on the Foundations of Digital Games (FDG)*. Montreal, QC, Canada: ACM, Aug. 2021, 47:1–5. DOI: [10.1145/3472538.3472579](https://doi.org/10.1145/3472538.3472579).

- [4] Xinyu Hu[†], Alec G. Moore[†], James Coleman Eubanks[†], Afham Ahmed Aiyaz⁺, and **Ryan P. McMahan**. “Evaluating Interaction Cue Purpose and Timing for Learning and Retaining Virtual Reality Training”. In: *ACM Symposium on Spatial User Interaction (SUI)*. Ottawa, Canada: ACM, Oct. 2020, 5:1–9. DOI: [10.1145/3385959.3418448](https://doi.org/10.1145/3385959.3418448).
- [5] Afshin Taghavi Nasrabadi[†], Aliehsan Samiei, Anahita Mahzari, **Ryan P. McMahan**, Ravi Prakash, Mylène C. Q. Farias, and Marcelo M. Carvalho. “A Taxonomy and Dataset for 360° Videos”. In: *ACM Multimedia Systems Conference (MMSys)*. Amherst, MA, USA: ACM, June 2019, pp. 273–278. DOI: [10.1145/3304109.3325812](https://doi.org/10.1145/3304109.3325812).
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- [22] **Ryan P. McMahan.** *A Brief Introduction to Virtual Reality.* UT Dallas Engineering Week Tech Talks. Richardson, TX, USA, February 16. 2017.
- [23] **Ryan P. McMahan.** *Introduction to Virtual Reality.* UT Dallas Virtual Reality Society Meeting. Richardson, TX, USA, January 31. 2017.
- [24] **Ryan P. McMahan.** *Developing High-Fidelity Virtual Reality Applications for da Vinci Training and Education.* Intuitive Surgical 2017 Clinical and Technology Research Grant Symposium. Sunnyvale, CA, USA, January 27. 2017.
- [25] **Ryan P. McMahan.** *The Benefits of Virtual Reality for da Vinci Training and Education.* Intuitive Surgical 2017 Education and Training Research Grant Symposium. Sunnyvale, CA, USA, January 26. 2017.
- [26] **Ryan P. McMahan.** *Framework for Full-Body VR Training Applications.* iPerform Industry-University Cooperative Research Center (I/UCRC) Meeting. Arlington, TX, USA, September 22. 2016.
- [27] **Ryan P. McMahan.** *Framework for Full-Body VR Training Applications.* iPerform Industry-University Cooperative Research Center (I/UCRC) Meeting. Arlington, TX, USA, March 4. 2016.
- [28] **Ryan P. McMahan** and Eric D. Ragan. *Interactive Computing: Virtual Reality.* 1st International Workshop on Interactive and Spatial Computing (IWISC). Richardson, TX, USA, December 5. 2015.
- [29] **Ryan P. McMahan.** *Framework for Assistive Portable Augmented Reality Applications.* iPerform Industry-University Cooperative Research Center (I/UCRC) Meeting. Richardson, TX, USA, October 9. 2015.
- [30] **Ryan P. McMahan.** *Framework for Full-Body VR Training Applications.* iPerform Industry-University Cooperative Research Center (I/UCRC) Meeting. Richardson, TX, USA, October 9. 2015.
- [31] **Ryan P. McMahan,** Ryan P. Ragan Eric D. McMahan, Fei Tang, James Coleman Eubanks, and Addison Stiles. *Future Immersive Virtual Environments (FIVE) Lab.* Computer Science Teachers Association Annual Conference. Richardson, TX, USA, July 13. 2015.
- [32] **Ryan P. McMahan.** *Future Immersive Virtual Environments (FIVE) Lab.* Dallas Unity Meetup. Richardson, TX, USA, June 13. 2015.
- [33] **Ryan P. McMahan.** *Virtual Reality for Safety Training.* iPerform Industry-University Cooperative Research Center (I/UCRC) Meeting. Arlington, TX, USA, April 8. 2015.
- [34] **Ryan P. McMahan.** *The Effects of Tactile and Olfactory Fidelities.* UT Dallas Computer Science Colloquium. Richardson, TX, USA, November 7. 2014.
- [35] **Ryan P. McMahan.** *Virtual Reality and Robots.* UT Dallas Robotics Initiative Meeting. Richardson, TX, USA, July 25. 2014.

- [36] **Ryan P. McMahan.** *Virtual Reality: The Future of Learning.* UT Dallas Explore Engineering Day. Richardson, TX, USA, February 22. 2014.
- [37] **Ryan P. McMahan.** *Future Immersive Virtual Environments (FIVE) Lab.* UT Dallas Computer Science Alumni Luncheon. Richardson, TX, USA, November 8. 2013.
- [38] **Ryan P. McMahan.** *The Effects of System Fidelity for Virtual Reality Applications.* UT Dallas Art Rendezvous Science (ARS) Colloquium. Richardson, TX, USA, April 10. 2013.
- [39] **Ryan P. McMahan.** *The Effects of System Fidelity for Virtual Reality Applications.* UT Dallas Computer Science Colloquium. Richardson, TX, USA, September 21. 2012.
- [40] **Ryan P. McMahan.** *Virtual Reality and 3D User Interfaces.* ARTSI Alliance Workshop: Advancing Robotics Technology for Societal Impact. Philadelphia, PA, USA, June 19. 2012.
- [41] **Ryan P. McMahan.** *Beneficial Uses of Virtual Reality and the Effects of System Fidelity.* UT Dallas Computer Science Seminar. Richardson, TX, USA, March 21. 2012.
- [42] **Ryan P. McMahan.** *Exploring the Effects of Higher-Fidelity Display and Interaction for Serious Virtual Reality Games.* Virginia Tech Human-Computer Interaction Seminar. Blacksburg, VA, USA, September 9. 2011.
- [43] **Ryan P. McMahan.** *Exploring the Effects of Display Fidelity and Interaction Fidelity.* Duke University Visualization Friday Forum. Durham, NC, USA, November 19. 2010.
- [44] **Ryan P. McMahan.** *Evaluating Natural Interaction Techniques in Video Games.* Virginia Tech Center for Human-Computer Interaction Student Speaker Series. Blacksburg, VA, USA, March 5. 2010.
- [45] **Ryan P. McMahan** and Steven Schafrik. *Visualization Initiatives at Virginia Tech.* 2nd International Mining Virtual Reality Group Workshop. Sydney, Australia, November 24. 2008.

INVITED PANELS

- [1] Mark Methenitis, Daniel Creekmore, Michael D. Karson, and **Ryan P. McMahan.** *Virtual Reality & Augmented Reality.* 15th Annual Symposium on Emerging Intellectual Property Issues: Disruptive Ideas and Emerging Technology. Dallas, TX, USA, September 21. 2018.
- [2] Ginger Alford, Nick Bontrager, Cole Forston, **Ryan P. McMahan,** and Jinsil Hwaryoung Seo. *Emerging Technologies in Immersive Experiences.* Fort Worth Museum of Science and History 2018 Infinity Festival. Fort Worth, TX, USA, July 22. 2018.
- [3] Pete DeNagy, Chuck Parker, Kevin Hart, and **Ryan P. McMahan.** *AR/VR and Human Interaction Redux.* TIA Network of the Future Conference. Dallas, TX, USA, June 7. 2016.
- [4] Emiola Banwo, Melissa Palmer, Jon Shapiro, **Ryan P. McMahan,** and Lucas Rodrigues. *From University Research to Real World Innovation.* Dallas Startup Week. Dallas, TX, USA, March 6. 2015.

OTHER OUTPUT

- [1] Kent Bye and **Ryan P. McMahan.** *#168: Ryan McMahan on climbing a ladder in VR with the March-and-Reach Technique.* Voices of VR Podcast. July 15, 2015. Retrieved from <http://voicesofvr.com/168-ryan-mcmahan-on-climbing-a-ladder-in-vr-with-the-march-and-reach-technique/>.
- [2] Paul A. Fishwick, Kang Zhang, and **Ryan P. McMahan.** *Generative Art and Virtual Reality.* Voices from the Crowd Podcast. December 6, 2014.

CURRENT PH.D. ADVISEES

- [1] Tiffany D. Do. Ph.D. candidate, Computer Science, University of Central Florida.
- [2] Jacob Belga. Ph.D. candidate (Co-advised with Joseph J. LaViola), Computer Science, University of Central Florida.
- [3] Esteban Segarra Martinez. Ph.D. candidate, Computer Science, University of Central Florida.
- [4] Nayan Chawla. Ph.D. student, Computer Science, University of Central Florida.
- [5] Martin Dinkov. Ph.D. student, Computer Science, University of Central Florida.
- [6] Austin Matthew. Ph.D. student, Computer Science, University of Central Florida.
- [7] Steven Zelenty. Ph.D. student, Computer Science, University of Central Florida.
- [8] Clive Hoayun. Ph.D. student, Computer Science, University of Central Florida.

ADVISED PH.D. GRADUATES

- [1] Xinyu Hu. *Methodologies for Evaluating Interaction Cues for Virtual Reality*. Ph.D. dissertation, Computer Science, University of Central Florida. Aug. 2023.
- [2] Alec G. Moore. *Applications for Machine Learning on Readily Available Data from Virtual Reality Training Experiences*. Ph.D. dissertation (Co-advised with Nicholas Ruozzi), Computer Science, University of Central Florida. Dec. 2022.
- [3] James Coleman Eubanks. *Effects of Full-Body Tracking on Embodiment in Virtual Reality*. Ph.D. dissertation (Co-advised with Paul A. Fishwick), Arts, Technology, and Emerging Communication, University of Texas at Dallas. Dec. 2020.
- [4] Shanthi Vellingiri. *Assessment of QoE and Learning Effectiveness in Collaborative Mixed Reality Environments*. Ph.D. dissertation (Co-advised with Balakrishnan Prabhakaran), Computer Engineering, University of Texas at Dallas. May 2020.
- [5] Elizabeth Berger. *A New Approach to Design Pedagogy Fostering Learning of Visual Design Principles Through M-Learning: Applying Algorithms to Visual Design Principles*. Ph.D. dissertation (Co-advised with Midori Kitagawa), Arts, Technology, and Emerging Communication, University of Texas at Dallas. Dec. 2019.
- [6] Chengyuan Lai. *3D Travel Techniques for Virtual Reality Cyberlearning Systems*. Ph.D. dissertation, Computer Science, University of Texas at Dallas. Aug. 2019.
- [7] Fei Tang. *Evaluating Tactile Fidelity of Resolution, Amplitude, and Algorithms for Grid-Based Tactile Sleeve Displays*. Ph.D. dissertation, Computer Science, University of Texas at Dallas. Dec. 2018.

ADVISED M.S. THESIS GRADUATES

- [1] Pauline Johnson. *Multivariate Cognitive Walkthrough of QubitVR: An Educational Quantum Computing, Virtual Reality Application*. M.S. thesis, Computer Science, University of Central Florida. May 2022.
- [2] Varshini Ramaraj. *Integration of Learning Principles into an Educational Virtual Reality System*. M.S. thesis, Computer Science, University of Texas at Dallas. May 2017.
- [3] Alec G. Moore. *VOTE: Vote-Oriented Technique Enhancements*. M.S. thesis, Computer Science, University of Texas at Dallas. May 2016.
- [4] Michael J. Howell. *FACT: Fidelity-Altered Context Techniques*. M.S. thesis, Computer Science, University of Texas at Dallas. May 2016.

- [5] Lesley Titus Pandian Thamarai. *Developing a High-Precision, High-Fidelity LEGO Simulator*. M.S. thesis, Computer Science, University of Texas at Dallas. May 2015.
- [6] Jian Ma. *Evaluation and Comparison of Head-Mounted Displays in Immersive Virtual Environments*. M.S. thesis, Computer Science, University of Texas at Dallas. Dec. 2014.

PH.D. DISSERTATION COMMITTEES

- [1] Sina Masnadi. *Distance Perception through Head Mounted Displays*. Ph.D. dissertation (Advised by Joseph J. LaViola), Computer Science, University of Central Florida. Aug. 2022.
- [2] Kattoju Ravi Kiran. *Automatic Posture Correction Utilizing Electrical Muscle Stimulation*. Ph.D. dissertation (Advised by Joseph J. LaViola), Modeling and Simulation, University of Central Florida. May 2022.
- [3] Gary M. Hardee. *FINESSE: Foundations for Immersive Non-Fiction Narrative as Embodied/Situated Simulation Experiences*. Ph.D. dissertation (Advised by Marjorie A. Zielke), Arts, Technology, and Emerging Communication, University of Texas at Dallas. Dec. 2019.
- [4] Ziheng Wang. *Modeling and Evaluation for Robot-Assisted Surgical Training and Intuitive Teleoperation*. Ph.D. dissertation (Advised by Ann Majewicz Fey), Mechanical Engineering, University of Texas at Dallas. Dec. 2019.
- [5] Kevin Desai. *Quantifying Experience and Task Performance in 3D Serious Games*. Ph.D. dissertation (Advised by Balakrishnan Prabhakaran), Computer Science, University of Texas at Dallas. May 2019.
- [6] Afshin Taghavi Nasrabadi. *Improving Quality of Experience for HTTP Adaptive Video Streaming: From Legacy to 360° Videos*. Ph.D. dissertation (Advised by Ravi Prakash), Computer Science, University of Texas at Dallas. May 2019.
- [7] Kanchan Bahirat. *On 3D Content Manipulation: Simplification, Modification and Authentication*. Ph.D. dissertation (Advised by Balakrishnan Prabhakaran), Computer Science, University of Texas at Dallas. Dec. 2018.
- [8] Junia da Rocha Valente. *Vulnerability Trends in IoT Devices and New Sensor-Assisted Security Protections*. Ph.D. dissertation (Advised by Alvaro A. Cardenas), Computer Science, University of Texas at Dallas. Dec. 2017.
- [9] Yuan Tian. *Haptic Rendering in 3D Immersive Virtual Environment*. Ph.D. dissertation (Advised by Balakrishnan Prabhakaran and Xiaohu Guo), Computer Science, University of Texas at Dallas. Dec. 2017.
- [10] John Kay. *Virtual Environments as Communication Technologies of Faith*. Ph.D. dissertation (Advised by Marjorie A. Zielke), Arts, Technology, and Emerging Communication, University of Texas at Dallas. Aug. 2017.
- [11] Asma Naz. *An Interactive Living Space for Neo-Nomads: An Anticipatory Approach*. Ph.D. dissertation (Advised by Mihai Nadin), Arts, Technology, and Emerging Communication, University of Texas at Dallas. May 2017.
- [12] Suraj Raghuraman. *I3DTI: Interactive 3D Tele-Immersion*. Ph.D. dissertation (Advised by Balakrishnan Prabhakaran), Computer Science, University of Texas at Dallas. May 2017.
- [13] Jeffrey Holcomb. *Computing Generalized Voronoi Diagrams*. Ph.D. dissertation (Advised by Jorge A. Cobb), Computer Science, University of Texas at Dallas. May 2016.
- [14] Yin Yang. *Physics-Based Subspace Deformation, Theory and Application*. Ph.D. dissertation (Advised by Xiaohu Guo), Computer Science, University of Texas at Dallas. May 2013.

M.S. THESIS COMMITTEES

- [1] Lakshmi Sharma. *Learn DNA: An Interactive VR Application for Learning DNA Structure*. M.S. thesis (Advised by Balakrishnan Prabhakaran), Computer Science, University of Texas at Dallas. May 2018.
- [2] Sudhir Ramalingam. *Importance of Interaction in Interactive 3D Tele-Immersion*. M.S. thesis (Advised by Balakrishnan Prabhakaran), Computer Science, University of Texas at Dallas. May 2016.
- [3] Aaron Plauché. *A Haptic Feedback System for Phase-Based Sensory Restoration in Above-Knee Prosthetic Leg Users*. M.S. thesis (Advised by Robert D. Gregg), Mechanical Engineering, University of Texas at Dallas. Dec. 2015.
- [4] Cameron Watkins. *Sensor Driven Realtime Animation for Feedback During Physical Therapy*. M.S. thesis (Advised by Balakrishnan Prabhakaran), Computer Science, University of Texas at Dallas. May 2015.
- [5] Ganesh Salvi. *Storage and Retrieval of Multimodal 3D Tele-Immersion Data*. M.S. thesis (Advised by Balakrishnan Prabhakaran), Computer Science, University of Texas at Dallas. Dec. 2014.

UNDERGRADUATE THESIS COMMITTEES

- [1] Yohan Hmaiti. *The Effects of Head-Centric Avatar Augmentation on Egocentric Distance Perception in Virtual Reality*. Honors undergraduate thesis (Advised by Joseph J. LaViola), Computer Science, University of Texas at Dallas. Aug. 2023.

OTHER ADVISED GRADUATE RESEARCH STUDENTS

* Authored/Co-authored one or more publications.

- [1] Alyssa Katz*. Independent Study, University of Texas at Dallas. Spring 2019.
- [2] Veena Somareddy*. Independent Study, University of Texas at Dallas. Spring 2015 – Fall 2015.
- [3] Swaroop K. Pal*. Independent Study, University of Texas at Dallas. Spring 2015.
- [4] Prathamesh Potnis*. Independent Study, University of Texas at Dallas. Spring 2015.
- [5] Addison W. Stiles*. Independent Study, University of Texas at Dallas. Spring 2015.
- [6] James Hall*. Independent Study, University of Texas at Dallas. Spring 2013.

ADVISED UNDERGRADUATE RESEARCH STUDENTS

* Authored/Co-authored one or more publications.

- [1] Qidi Wang. UCF SURF, University of Central Florida. Summer 2023.
- [2] Judy Khalaf. CAHSI LREU, University of Central Florida. Spring 2023.
- [3] Ayesha Malik. EXCEL URE, University of Central Florida. Spring 2023.
- [4] Jaralliesse Bastida. CAHSI LREU, University of Central Florida. Fall 2022.
- [5] Asma Ahmed. CAHSI LREU, University of Central Florida. Fall 2022.
- [6] Antonia Jimenez. CECS DIVE, University of Central Florida. Spring & Fall 2022.
- [7] James Pittman. EXCEL URE / NSF REU, University of Central Florida. Spring 2020 – Fall 2022.
- [8] Gabriela Shamblin. EXCEL URE, University of Central Florida. Spring 2022.
- [9] Jared Sevilla. EXCEL URE, University of Central Florida. Spring 2021.
- [10] Zachary Sheets. EXCEL URE, University of Central Florida. Spring 2021.
- [11] Jaelys Madera. EXCEL URE, University of Central Florida. Spring 2021.

- [12] Nafisa Mostofa*. NSF REU (Co-advised with Gregory Welch), University of Central Florida. Fall 2020 – Spring 2021.
- [13] Indira Avendano*. NSF REU (Co-advised with Gregory Welch), University of Central Florida. Fall 2020 – Spring 2021.
- [14] Gregory Allen. CECS DIVE, University of Central Florida. Summer 2020.
- [15] Afham Ahmed Aiyaz*. Research Volunteer, University of Texas at Dallas. Spring 2019.
- [16] Rohan Gupta*. Senior Design, University of Texas at Dallas. Spring 2018.
- [17] Anthony Lau*. Senior Design, University of Texas at Dallas. Spring 2018.
- [18] Adharsh Rajendran*. Senior Design, University of Texas at Dallas. Spring 2018.
- [19] Pooshan Shah*. Senior Design, University of Texas at Dallas. Spring 2018.
- [20] Tanushri Tarun Singh*. Senior Design, University of Texas at Dallas. Spring 2018.
- [21] John Hatch*. Research Volunteer, University of Texas at Dallas. Fall 2015 – Spring 2017.
- [22] Daniel Gutzwiller. Clark Summer Scholar, University of Texas at Dallas. Summer 2016.
- [23] Marwan Kodeih*. Independent Study, University of Texas at Dallas. Spring 2016.
- [24] Stephen Kuehl*. Independent Study, University of Texas at Dallas. Fall 2015.
- [25] Marriam Khan*. Independent Study, University of Texas at Dallas. Fall 2015.
- [26] Emily Risinger. Clark Summer Scholar, University of Texas at Dallas. Summer 2015.
- [27] Zyanya Valdes. UTD-Mexico Research Summer Scholar, University of Texas at Dallas. Summer 2015.
- [28] Nicolas Herrera*. URS Program, University of Texas at Dallas. Spring 2015.
- [29] Ilan Buzzetti. URS Program, University of Texas at Dallas. Spring 2015.
- [30] Tyler Hurst*. URS Program / Research Volunteer, University of Texas at Dallas. Spring 2013 – Spring 2014.

ADVISED HIGH SCHOOL RESEARCH STUDENTS

* Authored/Co-authored one or more publications.

- [1] Ann Segismundo*. FIVE Lab Research Experience Camp, University of Texas at Dallas. Summer 2018.
- [2] Ananya Phadke*. FIVE Lab Research Experience Camp, University of Texas at Dallas. Summer 2018.
- [3] Anoushka Singhania*. FIVE Lab Research Experience Camp, University of Texas at Dallas. Summer 2018.
- [4] Angelina Wu*. FIVE Lab Research Experience Camp, University of Texas at Dallas. Summer 2018.
- [5] Tassneen Bashir*. FIVE Lab Research Experience Camp, University of Texas at Dallas. Summer 2017.

ADVISED SENIOR DESIGN TEAMS

- [1] Armin Malekjahani, Jose Mendoza, Patrick Mesquita, Alexander Peterson, and Pierce Powell. *aVRage Paths*. Computer Science, University of Central Florida, Fall 2022 – Spring 2023.
- [2] Ghiasy Alexandre, Matthew Dowdy, Noah Gil, Isaiah Nagac, and Eddie Salvador. *Quantum Hydrogen Atom in VR*. Computer Science, University of Central Florida, Fall 2021 – Spring 2022.
- [3] Vincent Barone, Austin Concepcion, Pauline Johnson, Juan Rodriguez, and Ariel Towne. *Virtual Reality Quantum Computing Education (QubitVR) – Gold Team*. Computer Science, University of Central Florida, Fall 2020 – Spring 2021.

- [4] Javier Aguilar, Jeff Fortune, Timothy Jinks, Ahmed Mansour, and Jacob Powers. *Virtual Reality Quantum Computing Education (QubitVR) – Black Team*. Computer Science, University of Central Florida, Fall 2020 – Spring 2021.
- [5] Jennifer Brown, Ryan Ghamandi, Christian Jones, Daniel Rodriguez, and Holt Russell. *Tactile Telepresence for Isolated Patients*. Computer Science, University of Central Florida, Fall 2020 – Spring 2021.
- [6] James Dunlap, Jacob Greenway, Perry Lee, and Bodie Malik. *Motion Capture Interfacing*. Sponsored by Raytheon. Computer Science, University of Texas at Dallas, Spring 2019.
- [7] Troy Frazier, Marian Lusk, Michael Lyke, David Stenson, and Zana Warren. *Motion Capture Interface with the Leap Motion*. Sponsored by Raytheon. Computer Science, University of Texas at Dallas, Spring 2019.
- [8] Jennifer Bejarano, Akshaya Madhavan, Miguel Medrano, Sunil Sampath, and Gerald Zapata. *SurviVR – Team 2*. Sponsored by Immosis LLC. Computer Science, University of Texas at Dallas, Spring 2019.
- [9] Cristian Cave, Brandon Christy, Jeff Imam, Randall Moreland, and Tayfun Nalbantoglu. *SurviVR – Team 1*. Sponsored by Immosis LLC. Computer Science, University of Texas at Dallas, Spring 2019.
- [10] Rohan Gupta, Anthony Lau, Adharsh Rajendran, Pooshan Shah, and Tanushri Tarun Singh. *Surgical Planning in Virtual Reality*. Sponsored by UT Southwestern. Computer Science, University of Texas at Dallas, Spring 2018. 2nd Place Award.
- [11] Husam Abdelhadi, Brandon Marzik, Catherine Nguyen, and Gabriela Rodriguez. *VR and AR for Interventional Planning in Congenital Heart Disease*. Sponsored by UT Southwestern. Computer Science, University of Texas at Dallas, Fall 2017. 2nd Place Award.
- [12] Syed Salman Ahmad, Jackson Duke, Joshua Honeycutt, and Edward Min. *VR Platform for Visual Field Testing*. Sponsored by UT Southwestern. Computer Science, University of Texas at Dallas, Fall 2017.
- [13] Michael Abuda, Scott Prasse, Senay Sahle, Randi Sanchez, and Matthew Valencia. *DisconNet*. Sponsored by Raytheon. Computer Science, University of Texas at Dallas, Spring 2017.
- [14] Johnny Edgett, Sylvia Gong, Kyle Tillotson, and Yunqing Yang. *DisconNet*. Sponsored by Raytheon. Computer Science, University of Texas at Dallas, Fall 2016.
- [15] Mitchell Chapman, Nicholas DiCarlo, Alexander Long, and Aaron Tijerina. *Virtual Whiteboard*. Sponsored by Citigroup. Computer Science, University of Texas at Dallas, Fall 2016.
- [16] Emiola Banwo, Stephen Hales, and Nuno Resende. *A Browser for the Internet of Things*. Electrical Engineering, University of Texas at Dallas, Spring 2016.

TEACHING

PROGRAM DEVELOPMENT

- Graduate Certificate in Mixed Reality Engineering, University of Central Florida, Fall 2020
 - Co-developed graduate certificate program with Joseph J. LaViola.
 - Won a 2022-2023 Technology Fee award for \$45K to make VR headsets available to students.

COURSE DEVELOPMENT

- CAP 6117 Mixed Reality Project, University of Central Florida, Fall 2021
 - Developed and recorded 15 lecture videos.
- CAP 6110 Augmented Reality Engineering, University of Central Florida, Spring 2021
 - Developed and recorded over 110 lecture videos.

- Developed and recorded over 100 tutorial videos.
- CAP 5115 Virtual Reality Engineering, University of Central Florida, Fall 2020
 - Developed and recorded over 80 lecture videos.
 - Developed and recorded over 60 tutorial videos.
- CS 6334 Virtual Reality, University of Texas at Dallas, Fall 2015

COURSE INSTRUCTION AND SCORES

- CAP 3104 Foundations of HCI, University of Central Florida, Spring 2023 **4.15**/5.00
- CAP 5115 Virtual Reality Engineering, University of Central Florida, Spring 2023 **4.77**/5.00
- CAP 6117 Mixed Reality Project, University of Central Florida, Fall 2022 **5.00**/5.00
- CAP 6110 Augmented Reality Engineering, University of Central Florida, Spring 2022 **4.56**/5.00
- CAP 5115 Virtual Reality Engineering, University of Central Florida, Fall 2021 **4.96**/5.00
- CAP 6117 Mixed Reality Project, University of Central Florida, Fall 2021 **4.78**/5.00
- CAP 6110 Augmented Reality Engineering, University of Central Florida, Spring 2021 **5.00**/5.00
- CAP 5115 Virtual Reality Engineering, University of Central Florida, Fall 2020 **4.82**/5.00
- CAP 5937 Special Topics: Virtual Reality, University of Central Florida, Spring 2020 **4.67**/5.00
- CAP 6938 Special Topics: Augmented Reality, University of Central Florida, Spring 2020 **4.64**/5.00
- CS 4353 Human Computer Interactions II, University of Texas at Dallas, Spring 2019 **4.94**/5.00
- CS 6334 Virtual Reality, University of Texas at Dallas, Spring 2019 **4.92**/5.00
- CS 6334 Virtual Reality, University of Texas at Dallas, Fall 2018 **4.99**/5.00
- CS 4353 Human Computer Interactions II, University of Texas at Dallas, Spring 2018 **4.90**/5.00
- CS 6334 Virtual Reality, University of Texas at Dallas, Spring 2018 **4.99**/5.00
- CS 6334 Virtual Reality, University of Texas at Dallas, Fall 2017 **4.88**/5.00
- CS 4353 Human Computer Interactions II, University of Texas at Dallas, Spring 2017 **4.90**/5.00
- CS 7301 Recent Advances: Advanced VR, University of Texas at Dallas, Spring 2017 **5.00**/5.00
- CS 6334 Virtual Reality, University of Texas at Dallas, Fall 2016 **4.84**/5.00
- CS 4353 Human Computer Interactions II, University of Texas at Dallas, Spring 2016 **4.81**/5.00
- CS 6334 Virtual Reality, University of Texas at Dallas, Fall 2015 **4.90**/5.00
- CS 4353 Human Computer Interactions II, University of Texas at Dallas, Spring 2015 **4.76**/5.00
- CS 4352 Human Computer Interactions I, University of Texas at Dallas, Fall 2014 **4.88**/5.00
- CS 6301 Special Topics: Virtual Reality, University of Texas at Dallas, Fall 2014 **4.94**/5.00
- CS 6301 Special Topics: Virtual Reality, University of Texas at Dallas, Spring 2014 **5.00**/5.00

- CS 4352 Human Computer Interactions I, University of Texas at Dallas, Fall 2013 **4.71/5.00**
- CS 6378 Advanced Operating Systems, University of Texas at Dallas, Fall 2013 **4.89/5.00**
- CS 6301 Special Topics: Virtual Reality, University of Texas at Dallas, Spring 2013 **4.98/5.00**
- CS 6378 Advanced Operating Systems, University of Texas at Dallas, Fall 2012 **4.78/5.00**

TEACHING ASSISTANT

- CS 3204 Operating Systems, Virginia Tech, Spring 2005
- CS 4204 Computer Graphics, Virginia Tech, Fall 2004

PROFESSIONAL SERVICE

EDITORIAL SERVICE

- Associate Editor, *International Journal of Human-Computer Studies (IJHCS)*, 2014 – 2022.
- Associate Editor, *IEEE Transactions on Visualization and Computer Graphics (TVCG)*, 2019 – 2021.

GUEST EDITORIAL SERVICE

- Guest Associate Editor, *Computers and Graphics*, 2021 – 2022.
- Guest Associate Editor, *Frontiers in Virtual Reality*, 2020 – 2022.
- Guest Associate Editor, *Frontiers in Virtual Environments*, 2015 – 2017.

CONFERENCE ORGANIZING SERVICE

- Contest Co-Chair, *IEEE International Symposium on Mixed and Augmented Reality (ISMAR)*, 2021.
- Workshops Co-Chair, *IEEE Conference on Virtual Reality and 3D User Interfaces (VR)*, 2020.
- 3DUI Contest Co-Chair, *IEEE Conference on Virtual Reality and 3D User Interfaces (VR)*, 2018.
- 3DUI Contest Co-Chair, *IEEE Symposium on 3D User Interfaces (3DUI)*, 2017.
- Industry and Sponsorship Chair, *ACM Symposium on Spatial User Interaction (SUI)*, 2017.
- 3DUI Contest Co-Chair, *IEEE Symposium on 3D User Interfaces (3DUI)*, 2016.
- Web Co-Chair, *IEEE Virtual Reality Conference (VR)*, 2016.
- Publication Co-Chair, *IEEE Virtual Reality Conference (VR)*, 2015.
- Videos Co-Chair, *IEEE Virtual Reality Conference (VR)*, 2014.
- Student Volunteers Co-Chair, *IEEE Virtual Reality Conference (VR)*, 2008.
- Student Volunteers Co-Chair, *IEEE Virtual Reality Conference (VR)*, 2007.

CONFERENCE PROGRAM CHAIR SERVICE

- Program Co-Chair, *International Conference on Artificial Reality and Teleexistence & Eurographics Symposium on Virtual Environments (ICAT-EGVE)*, 2020.

- Virtual Reality Co-Chair, *International Symposium on Visual Computing (ISVC)*, 2014.

CONFERENCE PROGRAM COMMITTEE SERVICE

- Program Committee, *ACM Conference on Human Factors in Computing Systems (CHI)*, 2024.
- Journal Program Committee, *IEEE International Symposium on Mixed and Augmented Reality (ISMAR)*, 2023.
- Program Super Committee, *IEEE Conference on Virtual Reality and 3D User Interfaces (VR)*, 2023.
- Program Committee, *IEEE Conference on Virtual Reality and 3D User Interfaces (VR)*, 2023.
- Program Committee, *ACM Symposium on Spatial User Interaction (SUI)*, 2022.
- Program Committee, *ACM Symposium on Virtual Reality Software and Technology (VRST)*, 2022.
- Journal Program Committee, *IEEE International Symposium on Mixed and Augmented Reality (ISMAR)*, 2022.
- Journal Program Committee, *IEEE Conference on Virtual Reality and 3D User Interfaces (VR)*, 2022.
- Program Committee, *ACM Symposium on Spatial User Interaction (SUI)*, 2021.
- Program Committee, *ACM Symposium on Virtual Reality Software and Technology (VRST)*, 2021.
- Journal Program Committee, *IEEE International Symposium on Mixed and Augmented Reality (ISMAR)*, 2021.
- Program Committee, *IEEE International Conference on Intelligent Reality (ICIR)*, 2021.
- Program Committee, *ACM Symposium on Virtual Reality Software and Technology (VRST)*, 2020.
- Program Committee, *IEEE International Symposium on Mixed and Augmented Reality (ISMAR)*, 2020.
- Conference Program Committee, *IEEE Conference on Virtual Reality and 3D User Interfaces (VR)*, 2020.
- Program Committee, *ACM Symposium on Spatial User Interaction (SUI)*, 2019.
- Program Committee, *IEEE International Symposium on Mixed and Augmented Reality (ISMAR)*, 2019.
- Conference Program Committee, *IEEE Conference on Virtual Reality and 3D User Interfaces (VR)*, 2019.
- Program Committee, *IEEE International Conference on Artificial Intelligence and Virtual Reality (AIVR)*, 2018.
- Program Committee, *ACM Symposium on Spatial User Interaction (SUI)*, 2018.
- Conference Program Committee, *IEEE Conference on Virtual Reality and 3D User Interfaces (VR)*, 2018.
- Program Committee, *IEEE Symposium on 3D User Interfaces (3DUI)*, 2017.
- Program Committee, *ACM Symposium on Spatial User Interaction (SUI)*, 2017.
- Program Committee, *IEEE Symposium on 3D User Interfaces (3DUI)*, 2016.
- Program Committee, *ACM Symposium on Spatial User Interaction (SUI)*, 2016.
- Program Committee, *IEEE Virtual Reality Conference (VR)*, 2016.
- Program Committee, *ACM Symposium on Virtual Reality Software and Technology (VRST)*, 2016.
- Program Committee, *IEEE Symposium on 3D User Interfaces (3DUI)*, 2015.

- Program Committee, *IEEE Symposium on Haptic, Audio and Visual Environments and Games (HAVE)*, 2015.
- Program Committee, *ACM Symposium on Spatial User Interaction (SUI)*, 2015.
- Program Committee, *IEEE Virtual Reality Conference (VR)*, 2015.
- Program Committee, *ACM Symposium on Virtual Reality Software and Technology (VRST)*, 2015.
- Program Committee, *IEEE Symposium on 3D User Interfaces (3DUI)*, 2014.
- Program Committee, *IEEE Symposium on Haptic, Audio and Visual Environments and Games (HAVE)*, 2014.
- Program Committee, *IEEE Virtual Reality Conference (VR)*, 2014.

OTHER CONFERENCE SERVICE

- Significant New Researcher Committee, *IEEE Conference on Virtual Reality and 3D User Interfaces (VR)*, 2023.
- Session Chair, *IEEE Conference on Virtual Reality and 3D User Interfaces (VR)*, 2022.
- Significant New Researcher Committee, *IEEE Conference on Virtual Reality and 3D User Interfaces (VR)*, 2022.
- Doctoral Consortium Mentor, *IEEE International Symposium on Mixed and Augmented Reality (ISMAR)*, 2021.
- Competition Judge, *IEEE International Conference on Intelligent Reality (ICIR)*, 2021.
- Session Chair, *IEEE Conference on Virtual Reality and 3D User Interfaces (VR)*, 2021.
- Session Chair, *IEEE Virtual Reality Conference (VR)*, 2015.

WORKSHOP ORGANIZING SERVICE

- Workshop Organizer, “Annual Workshop on 3D Content Creation for Simulated Training in eXtended Reality (TrainingXR)”, held at *IEEE Conference on Virtual Reality and 3D User Interfaces (VR)*, 2023.
- Workshop Organizer, “First Workshop on Photorealistic Image and Environment Synthesis for Computer Vision (PIES-CV)”, held at *IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)*, 2023.
- Workshop Organizer, “First Workshop on Photorealistic Image and Environment Synthesis for Mixed Reality (PIES-MR)”, held at *IEEE International Symposium on Mixed and Augmented Reality (ISMAR)*, 2022.
- Workshop Organizer, “First Workshop on Photorealistic Image and Environment Synthesis for Multimedia Experiments (PIES-ME)”, held at *ACM International Conference on Multimedia (MM)*, 2022.
- Workshop Organizer, “Annual Workshop on 3D Content Creation for Simulated Training in eXtended Reality (TrainingXR)”, held at *IEEE Conference on Virtual Reality and 3D User Interfaces (VR)*, 2022.
- Workshop Organizer, “Annual Workshop on 3D Content Creation for Simulated Training in eXtended Reality (TrainingXR)”, held at *IEEE Conference on Virtual Reality and 3D User Interfaces (VR)*, 2021.

WORKSHOP PROGRAM CHAIR SERVICE

- Technical Program Chair, *International Workshop on Interactive and Spatial Computing (IWISC)*, 2018.

WORKSHOP PROGRAM COMMITTEE SERVICE

- Program Committee, *ACM International Workshop on Multimodal Virtual and Augmented Reality (MVAR)*, 2016.

FEDERAL AGENCY REVIEW SERVICE

- Panelist, NSF Division of Information and Intelligent Systems (IIS), Nov 2023.
- Panelist, NSF Directorate for STEM Education (EDU), June 2023.
- Panelist, NSF Directorate for Education and Human Resources (EHR), January 2023.
- Panelist, NSF Directorate for Engineering (ENG), June 2022.
- Reviewer, NSF Directorate for Education and Human Resources (EHR), March 2022.
- Reviewer, NSF Directorate for Education and Human Resources (EHR), January 2022.
- Panelist, NSF Directorate for Education and Human Resources (EHR), December 2021.
- Reviewer, NSF Directorate for Education and Human Resources (EHR), October 2021.
- Panelist, NSF Division of Computer and Network Systems (CNS), February 2021.
- Panelist, NSF Directorate for Education and Human Resources (EHR), January 2021.
- Panelist, NSF Division of Computer and Network Systems (CNS), May 2020.
- Reviewer, NSF Division of Social and Economic Sciences (SES), March 2020.
- Panelist, NSF Directorate for Technology, Innovation and Partnerships (TIP), November 2019.
- Panelist, NSF Directorate for Technology, Innovation and Partnerships (TIP), May 2019.
- Panelist, NSF Division of Information and Intelligent Systems (IIS), April 2019.
- Reviewer, Army Research Office (ARO), May 2018.
- Panelist, NSF Division of Information and Intelligent Systems (IIS), March 2018.
- Panelist, NSF Directorate for Computer and Information Science and Engineering (CISE), November 2016.

PH.D. DISSERTATION EXAMINATION SERVICE

- External Examiner, Bradley Herbert, University of South Australia, UA, Spring 2021.
- External Examiner, Hyungon Kim, University of Canterbury, NZ, Fall 2017.

OTHER PROFESSIONAL SERVICE

- Founding Committee, The Higher Education Campus Alliance for Advanced Visualizations (THE CAAV), 2015 – 2016.

UNIVERSITY SERVICE

UNIVERSITY DIRECTORSHIP SERVICE

- Associate Program Director, Mixed Reality Engineering Graduate Certificate, University of Central Florida, 2020 – Present.
- Lab Director, Extended Reality & Training (XRT) Lab, University of Central Florida, 2019 – Present.

- Lab Director, Future Immersive Virtual Environments (FIVE) Lab, University of Texas at Dallas, 2012 – 2019.

UNIVERSITY CHAIR SERVICE

- Outside Dissertation Exam Chair, Venkata Srikrishna Pillutla, University of Texas at Dallas, 2017.
- Outside Dissertation Exam Chair, Cheng Shi, University of Texas at Dallas, 2015.
- Outside Dissertation Exam Chair, Kyung Sung Jung, University of Texas at Dallas, 2013.

UNIVERSITY COMMITTEE SERVICE

- Faculty Senate Information Technology Committee, University of Central Florida, 2021 – 2023.
- Office of Research NSF CAREER Mentoring Committee, University of Central Florida, 2022.
- Office of Research NSF CAREER Mentoring Committee, University of Central Florida, 2021.
- Institutional Review Board Committee, University of Texas at Dallas, 2016 – 2019.
- Galaxy Portal Revolution Committee, University of Texas at Dallas, 2016 – 2017.
- Dean of ATEC Review and Recommendation Committee, University of Texas at Dallas, 2015.
- 3D Visualization Facility Feasibility Study Committee, University of Texas at Dallas, 2013 – 2015.

UNIVERSITY ADVISING SERVICE

- Faculty Advisor, Girls Who Code (GWC) Student Organization, University of Central Florida, 2022 – Present.
- Faculty Advisor, Extended Reality Society Student Organization, University of Texas at Dallas, 2016 – 2019.

OTHER UNIVERSITY SERVICE

- Focus Group, IDL6543, University of Central Florida, 2022.
- Proposal Reviewer, Limited Submissions, University of Central Florida, 2022.
- Proposal Reviewer, Seed Funding, University of Central Florida, 2021.
- Proposal Reviewer, Seed Funding, University of Central Florida, 2019.

SCHOOL CHAIR SERVICE

- CS Publicity Chair, University of Central Florida, 2021 – Present.
- CS Publicity and Website Chair, University of Texas at Dallas, 2013 – 2016.

SCHOOL COMMITTEE SERVICE

- CS Graduate Committee, University of Central Florida, 2021 – Present.
- CS Cumulative Progress Evaluation Committee, University of Central Florida, 2023.
- CS Cumulative Progress Evaluation Committee, University of Central Florida, 2022.
- CS Instructor and Lecturer Faculty Promotion Committee, University of Central Florida, 2020.

- CS Cumulative Progress Evaluation Committee, University of Central Florida, 2020.
- ATEC Computational Media Area Committee, University of Texas at Dallas, 2018 – 2019.
- CS Publicity and Website Committee, University of Texas at Dallas, 2013 – 2019.
- CS Ph.D. Recruitment Committee, University of Texas at Dallas, 2013 – 2019.
- ATEC Computer Science I Committee, University of Texas at Dallas, 2017.
- CS Ad Hoc Affiliated Faculty Committee, University of Texas at Dallas, 2017.
- ATEC Game Production Faculty Search Committee, University of Texas at Dallas, 2016 – 2017.
- CS Graduate Admissions Committee, University of Texas at Dallas, 2012 – 2017.
- ATEC Game Studies Faculty Search Committee, University of Texas at Dallas, 2015 – 2016.
- CS Advanced Operating Systems Qualifying Exam Committee, University of Texas at Dallas, 2012 – 2014.

OTHER SERVICE

ADVISORY BOARD SERVICES

- Advisory Board Member, MyndVR, LLC, 2017 – Present.
- Advisory Board Member, Survivr, PBC, 2018 – 2021.

CONSULTING SERVICES

- Professional Team Member, Florida Commission on Hurricane Loss Projection Methodology, State Board of Administration of Florida, 2020 – Present.

EXPERT WITNESS SERVICES

- Expert Witness, Baird Law Group, Tampa, FL, 2021.