Eric D. Ragan

Assistant Professor of Computer Science
University of Florida
eragan@ufl.edu

University of Florida
PO Box 116120
E301 CSE Building
Gainesville, FL 32611

Website: www.cise.ufl.edu/~eragan

APPOINTMENTS

Current

- University of Florida (August 2018 – Present)
  Assistant Professor, Computer & Information Science & Engineering

Prior Research Appointments

- Texas A&M University (August 2015 – August 2018)
  Assistant Professor
  Department of Visualization (primary), Department of Computer Science (by courtesy)
- Oak Ridge National Laboratory (August 2013 – July 2015)
  Research Scientist, Computational Sciences & Engineering Division

EDUCATION

Ph. D., Computer Science, 2013
Virginia Tech, Blacksburg, VA

- Dissertation Topic: Supporting Learning through Spatial Information Presentations in 3D Virtual Environments
- Chair: Dr. Doug A. Bowman
- Advisory Committee: Richard E. Mayer, Chris North, Francis Quek, and Tonya Smith-Jackson

Graduate Certificate in Human-Computer Interaction, 2011
Virginia Tech, Blacksburg, VA

M.S., Computer Science and Applications, 2010
Virginia Tech, Blacksburg, VA

B.S., Mathematics, Computer Science, (Dual Major) 2007
Gannon University, Erie, PA

- Graduated summa cum laude

RESEARCH INTERESTS

- Human-computer interaction (HCI); human-centered computing (HCC)
- Visual analytics
- Virtual reality (VR) and 3D interaction
- Information visualization

HONORS AND AWARDS

- ACM CHI 2018 Honorable Mention Award (top 5% of papers). For Balancing Privacy and Information Disclosure in Interactive Record Linkage with Visual Masking. *ACM CHI Conference on Human Factors in Computing Systems*. With Hye-Chung Kum, Gurudev Ilangovan, and Han Wang.

- AACSRE Emerging Fellow, Academic Advisory Council for Signage Research and Education, 2017-2019
- Society for Information Technology and Teacher Education/National Technology Leadership Initiative Award. College and University Faculty Assembly of the National Council for the Social Studies (NCSS), 2017, with David Hicks, Aaron Johnson, Todd Ogle, Stephanie van Hover, Doug Bowman, and Thomas Tucker.
- Engineering Genesis Award for Multidisciplinary Research, Texas A&M University, 2017, with Xia Ben Hu.
- IBM Faculty Award, IBM Research, 2016.
- Raising the Bar Research Award, College of Architecture, Texas A&M University, 2016, 2017.
- First Place Award, 2012 3DUI Contest held at the IEEE Symposium on 3D User Interfaces (with Felipe Bacim, Doug Bowman, Siroberto Scerbo, and Cheryl Stinson).
- Popular Choice Award, 2012 3DUI Contest held at the IEEE Symposium on 3D User Interfaces (with Felipe Bacim, Doug Bowman, Siroberto Scerbo, and Cheryl Stinson).
- Davenport Fellowship recipient, Virginia Tech, 2012.
- Best Poster Award, ASNE Human Systems Integration Symposium, 2011, for the poster "The Effects of Visual Realism on Training Transfer in Immersive Virtual Environments" (with Cheryl Stinson, Regis Kopper, Siroberto Scerbo, and Doug Bowman).
- Honorable Mention Best Paper Award, Joint Virtual Reality Conference, 2009, for the paper "Higher Levels of Immersion Improve Procedure Memorization Performance" (with Ajith Sowndararajan, Regis Kopper, and Doug Bowman).
- Academic Award for Excellence in Computer and Information Science, Gannon University, 2007.
- John Mark Gannon Award for General Scholastic Excellence. Gannon University, 2007.
- Honors Program Honors Scholar, Gannon University, 2007.

FUNDING AND SUPPORT

Grants and Awards (External)

- **NSF** (*Co-PI*). III: Medium: Collaborative Research: Towards Effective Interpretation of Deep Learning: Prediction, Representation, Modeling and Utilization. Xia "Ben" Hu, Eric Ragan, Jianhua Huang, Na Zou. 8/15/2019 - 7/31/2023. Responsible for $200,000.
- **AACSRE** (*PI*). Investigating Embellishment in Infographic Signage. Eric Ragan. Academic Advisory Council for Signage Research and Education Emerging Fellows Program. 3/2017-3/2019. $20,000. Responsible for 100%.
- **DARPA** (*Co-PI*). Transforming Deep Learning to Harness the Interpretability of Shallow Models: An Interactive End-to-End System. Xia "Ben" Hu, Eric Ragan, Shuiwang Ji. 5/2017-4/2021. Funded by DARPA XAI Program. Total $1,831,722. Responsible for $457,930.
- **DARPA** (*Co-PI*). Tractable Probabilistic Logic Models: A New Deep Explainable Representation. Funded by DARPA XAI Program. Vibhav Gogate, Nicholas Ruozzi, Adnan Darwiche, Guy Van den Broeck, Eric Ragan, Parag Singla. 5/2017-4/2021. Total $4,309,551. Responsible for $731,133.
- **PCORI** (*Co-PI*). Privacy Preserving Interactive Record Linkage (PPIRL) via Information Suppression. Funded by Patient-Centered Outcomes Research Institute. Hye-Chung Kum, Alva Ferdinand, Eric Ragan, Daniel Basile. 3/2017-2/2020. $1,019,641. Responsible for $131,110.
- **NSF** (*PI*). CRII: III: Evaluating Provenance Visualizations for the Presentation and Communication of Investigative Data Analysis Processes. 8/2016 – 7/2018. Eric Ragan. Funded by National Science Foundation (NSF) Computer and Information Science and Engineering (CISE) Research Initiation Initiative (CRII) program, Information Integration and Informatics. $174,927. Responsible for 100%.

- **IBM** (*PI*). Studying multi-format visual data exploration and presentation methods. IBM Faculty Award. Funded by IBM Research. 2016. Eric Ragan. $5,000. Responsible for 100%.

Gifts

- From Oculus VR, LLC. and Samsung to Texas A&M University (Eric Ragan). Oculus Pioneers Program. 2016. Equipment donations and program support.
- From AMD (Advanced Micro Devices) to Texas A&M University (Eric Ragan). AMD's Creators' Circle University Program. 2016. Equipment donations.

Internal Grants

- **Texas A&M**. (Co-PI). SimCRAFT: A Virtual Design Platform for Experimental Learning and Collaborative Engineering Design. Gregory Chamitoff, Sharath Grimaji, Eric Ragan. Texas A&M University Tier One Program (TOP) interdisciplinary education grant. September 2017 – August 2020. Total $300,00. Responsible for $50,000.
- **Oak Ridge** (PI). Visual analytics applications: Design and evaluation of prototypes to spatially organize data and evaluate memory and communication of the analytics process. Eric Ragan. Oak Ridge National Laboratory internal award. Director's R&D Fund. November 2013 – September 2014. $82,000. Responsible for 100%.

PUBLICATIONS

Refereed Journal Articles

1. Bolte, F., Nourani, M., **Ragan, E.**, and Bruckner, S. (2020). SplitStreams: A Visual Metaphor for Evolving Hierarchies, *IEEE Transactions on Visualization and Computer Graphics (TVCG)*.
2. Peña, A., **Ragan, E.**, and Harrison, L. (2020). Memorability of Enhanced Informational Graphics: The Effects of Design Relevance and Chart type on Recall. *AACSRE Interdisciplinary Journal of Signage and Wayfinding*, Vol 4, No 1. doi: 10.15763/issn.2470-9670.2020.v4.i1.a54
3. Madanagopal, K., **Ragan, E.**, and Benjamin, P. (2019). Analytic Provenance in Practice: The Role of Provenance in Real-World Visualization and Data Analysis Environments. *IEEE Computer Graphics and Applications*. doi: 10.1109/MCG.2019.2933419
4. Mohanty, R., Castillo, R., **Ragan, E.**, and Krishnamurthy, V. (2019). Investigating Force Feedback in Mid-air Sketching of Multi-planar 3D Curve-Soups. *ASME Journal of Computing and Information Science in Engineering*. pp 1-14. doi: 10.1115/1.4045142
5. Shi, Y., Du, J., Ahn, C. R., and **Ragan, E.** (2019). Impact assessment of reinforced learning methods on construction workers' fall risk behavior using virtual reality. *Automation in Construction*, 104, 197-214.
6. Rahimi, K., Banigan, C., and **Ragan, E.** (2018). Scene Transitions and Teleportation in Virtual Reality and the Implications for Spatial Awareness and Sickness, *IEEE Transactions on Visualization and Computer Graphics (TVCG)*. PP 1-15. doi: 10.1109/TVCG.2018.2884468.
7. Goodall, J., **Ragan, E.**, Steed, C., Reed, J., Richardson, G., Huffer, K., Bridges, R., and Laska, J. (2018). Situ: Identifying and Explaining Suspicious Behavior in Networks, *IEEE Transactions on Visualization and Computer Graphics (TVCG)*. PP 1-11. doi: 10.1109/TVCG.2018.2865029
8. Han, D., Suhail, M., and **Ragan, E.** (2018). Evaluating Remapped Physical Reach for Hand Interactions with Passive Haptics in Virtual Reality, *IEEE Transaction on Visualization and Computer Graphics (TVCG)*, April 2018, 24(4), pp. 1-10. doi: 10.1109/TVCG.2018.2794659.
9. Saket, B., Srinivasan, A., **Ragan, E.**, Endert, A. (2017). Evaluating Interactive Graphical Encodings for Data Visualization. *IEEE Transactions on Visualization and Computer Graphics (TVCG)*, PP, 1-14. doi: 10.1109/TVCG.2017.2680452

10. Johnson, A., Hicks, D., Ogle, T., Bowman, D., Cline, D., **Ragan, E.** (2017). If This Place Could Talk: Using Augmented Reality to Make the Past Visible. *Social Education*, 81(2), March/April 2017, pp. 112-116(5).

11. **Ragan, E.**, Scerbo, S., Bacim, F., and Bowman, D. (2016). Amplified Head Rotation in Virtual Reality and the Effects on 3D Search, Training Transfer, and Spatial Orientation. *IEEE Transactions on Visualization and Computer Graphics (TVCG)*. vol. 23, no. 8, pp. 1880-1895, Aug. 1 2017. doi: 10.1109/TVCG.2016.2601607

12. **Ragan, E.**, Endert, A., Sanyal, J., and Chen, J. (2016). Characterizing Provenance in Visualization and Data Analysis: An Organizational Framework of Provenance Types and Purposes. *IEEE Transactions on Visualization and Computer Graphics (TVCG)*. 22(1), 31-40. doi: ra10.1109/TVCG.2015.2467551

13. **Ragan, E.**, Bowman, D., Kopper, R., Stinson, C., Scerbo, S., McMahan, R. (2015). Effects of field of view and visual realism on virtual reality training effectiveness for a visual scanning task. *IEEE Transactions on Visualization and Computer Graphics (TVCG)*. 21(7), 794-807. doi: 10.1109/TVCG.2015.2403312

14. **Ragan, E.**, Jennings, S., Massey, J., and Doolittle, P. (2014). Unregulated Use of Laptops over Time in Large Lecture Classes. *Computers and Education*, 78, 78–86. doi: 10.1016/j.compedu.2014.05.002

15. **Ragan, E.**, Kopper, R., Schuchardt, P., and Bowman, D. (2013). Studying the Effects of Stereo, Head Tracking, and Field of Regard on a Small-Scale Spatial Judgment Task. *IEEE Transactions on Visualization and Computer Graphics (TVCG)*. 19(5), 886-896. doi: 10.1109/TVCG.2012.163

16. Bowman, D., McMahan, R., and **Ragan, E.** (2012). Questioning Naturalism in 3D User Interfaces. *Communications of the ACM*, 55(9), 78–88. doi: 10.1145/2330667.2330687

17. **Ragan, E.**, Huber, K., and Bowman, D. (2012). Supporting Cognitive Processing with Spatial Information Presentations in Virtual Environments. *Virtual Reality*. 16(4), 301-314. doi: 10.1007/s10055-012-0211-8

18. McMahan, R., **Ragan, E.**, Leal, A., Beaton, R., and Bowman, D. (2011). Considerations for the Use of Commercial Video Games in Controlled Experiments. *Entertainment Computing*, 2(1), 3-9. doi: 10.1016/j.entcom.2011.03.002

19. **Ragan, E.**, Sowndararajan, A., Kopper, R., and Bowman, D. (2010). The Effects of Higher Levels of Immersion on Procedure Memorization Performance and Implications for Educational Virtual Environments. *Presence: Teleoperators and Virtual Environments*, 19(6), 527-543. doi:10.1162/pres_a_00016

Refereed Conference Papers

1. Esmaeili, S., Benda, B., and **Ragan, E.** (2020). Detection of Scaled Hand Interactions in Virtual Reality: The Effects of Motion Direction and Task Complexity. *IEEE Conference on Virtual Reality and 3D User Interfaces (IEEE VR)*.

2. Nourani, M., Kabir, S., Mohseni, S., and **Ragan, E.** (2019). The Effects of Meaningful and Meaningless Explanations on Trust and Perceived System Accuracy in Intelligent Systems. *AAAI Conference on Human Computation and Crowdsourcing* (AAAI HCOMP).

3. Kum, HC, **Ragan, E.**, Ilangovan, G., and Ramezani, Q., Li, Q., and Schmit, C. (2019). Enhancing Privacy through an Interactive On-demand Incremental Information Disclosure Interface: Applying Privacy-by-Design to Record Linkage. *USENIX Symposium on Usable Privacy and Security* (SOUPS 2019).

4. Feijóo-García, P.G., Wang, S., Cai, J., Polavarapu, N., Gardner-McCune, C., and **Ragan, E.** (2019). Blocks4DS: A Scaffolded Block-Based Learning Environment for Hierarchical Data Structures. *VL/HCC 2019 IEEE Symposium on Visual Languages & Human-Centric Computing*.

5. Stebbins, T. and **Ragan, E.** (2019). Redirecting View Rotation in Immersive Movies with Washout Filters. In Proceedings of *IEEE Conference on Virtual Reality and 3D User Interfaces* (IEEE VR) 2019.

6. Shi, Y., Du, J., Sargunam, S. P., and **Ragan, E**. (2019). First Responders' Spatial Working Memory of Large-scale Buildings: Implications of Information Format. In Proceedings of 2019 ASCE International Conference on Computing in Civil Engineering (i3CE2019).

7. Mohanty, R., Bohari, U., **Ragan, E.**, and Vinayak. (2018). Kinesthetically Augmented Mid-air Sketching of Multi-planar 3D Curve-Soups. In ASME 2018 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference.

8. **Ragan, E.**, Kum, HC, Ilangovan, G., and Wang, H. (2018). Balancing Privacy and Information Disclosure in Interactive Record Linkage with Visual Masking. To appear in *ACM CHI Conference on Human Factors in Computing Systems* (ACM CHI). **Award winner**: Honorable Mention Award (top 5% of papers)

9. Chen, H., Engle, S., Joshi, A., **Ragan, E.**, Yuksel, B., and Harrison, L. (2018). Using Animation to Alleviate Overdraw in Multiclass Scatterplot Matrices. To appear in *ACM CHI Conference on Human Factors in Computing Systems* (ACM CHI).

10. Shi, Y., Du, J., **Ragan, E.**, Choi, K., and Ma, S. (2018). The Impact of Social Learning on Construction Safety Behaviors: A Multiuser Virtual Reality Experiment. To appear in *Proceedings of Construction Research Congress 2018*. New Orleans, LA

11. Sargunam, S., Moghadam, K., Suhail, M., and **Ragan, E.** (2017). Guided Head Rotation and Amplified Head Rotation: Evaluating Semi-Natural Travel and Viewing Techniques in Virtual Reality. *Proceedings of IEEE Virtual Reality Conference (IEEE VR)*.

12. Stewart, R., Wilkerson, C., **Ragan, E.**, Agreda, M., White, D., and Piburn, J. (2016). A 3D Virtual Environment for Spatio-Temporal Analysis: Theoretical Approach, Proof of Concept, and User Study. *Proceedings of International Conference on Geographic Information Science (GIScience) 2016*.

13. Singh, G., Bowman, D., Hicks, D., Cline, D., Ogle, J., Johnson, A., Zlokas, R., Tucker, T., and **Ragan, E.** (2015). CI-Spy: Designing A Mobile Augmented Reality System for Scaffolding Historical Inquiry Learning. In *Proceedings of International Symposium on Mixed and Augmented Reality (ISMAR 2015)*. MASH'D (Media, Arts, Social Sciences, Humanities & Design) paper. IEEE Computer Society.

14. **Ragan, E.**, Goodall, J., and Tung, A. (2015). Evaluating the Effectiveness of Visual History and the Impact of Visual Cues on Process Memory. In *Proceedings of CHI Conference on Human Factors in Computing Systems* (CHI 2015). 1 – 10. ACM.

15. Bowman, D., **Ragan, E.**, Scerbo, S., and Bacim, F. (2013). Evaluating the Impact of Head Rotation Amplification on Virtual Reality Training Effectiveness. In Proceedings of Interservice/Industry Training, Simulation and Education Conference (I/ITSEC 2013). 1 – 11, Orlando, FL. NTSA.

16. Bacim, F., **Ragan, E.**, Scerbo, S., Setareh, M., Jones, B., and Polys, N. (2013). The Effects of Display Fidelity, Visual Complexity, and Task Scope on Spatial Understanding of 3D Graphs. 1 – 8. In Proceedings of Graphics Interface 2013.

17. Bowman, D., Stinson, C., **Ragan, E.**, Scerbo, S., Hollerer, T., Lee, C., McMahan, R., and Kopper, R. (2012). Evaluating effectiveness in virtual environments with MR simulation. In Proceedings of Interservice/Industry Training, Simulation and Education Conference (*I/ITSEC 2012*). 1 – 11. Orlando, FL. NTSA.

18. **Ragan, E.**, Wood, A., McMahan, R., and Bowman, D. (2012). Trade-Offs Related to Travel Techniques and Level of Display Fidelity in Virtual Data-Analysis Environments. In Proceedings of *Joint Virtual Reality Conference of EGVE - ICAT - EuroVR*, 2012. 81 – 84. Eurographics.

19. **Ragan, E.**, Endert, A., Bowman, D., and Quek, F. (2012). How Spatial Layout, Interactivity, and Persistent Visibility Affect Learning with Large Displays. In Proceedings of the *International Working Conference on Advanced Visual Interfaces, AVI 2012*. 91 – 98. ACM.

20. **Ragan, E.**, Huber, K., Laha, B., and Bowman, D. (2012). The Effects of Navigational Control and Environmental Detail on Learning in 3D Virtual Environments. In Proceedings of the 2012 *IEEE Virtual Reality Conference*. Orange County, CA. 11 – 14. IEEE Computer Society.

21. Bowman, D., Sowndararajan, A., **Ragan, E.**, and Kopper, R. (2009). Higher Levels of Immersion Improve Procedure Memorization Performance. In Proceedings of *Joint Virtual*

Reality Conference of EGVE - ICAT - EuroVR, 2009. 121 – 128. Lyon, France. Eurographics. **Award winner**: best paper, honorable mention.

22. **Ragan, E.**, Frezza, S., and Cannell, J. (2009). Product-Based Learning in Software Engineering Education. In Proceedings of *Frontiers in Education* 2009 Conference. 524 – 529. San Antonio, Texas.

23. Barksdale, J., **Ragan,** E., and McCrickard, S. (2009). Easing Team Politics in Agile Usability: A Concept Mapping Approach. In Proceedings of the 2009 *Conference on Agile Software Development*. 19 – 25. Chicago, Illinois.

Conference Workshop Papers, Posters, and Presentations

1. Paul, D. and **Ragan, E.** (2020). Subtle Gaze Direction with Asymmetric Field-of-View Modulation in Headworn Virtual Reality. Extended abstract. *IEEE Virtual Reality and 3D User Interfaces* (IEEE VR 2020)

2. Nourani, M., Honeycutt, D., Block, J., Roy, C., Rahman, T., **Ragan, E.**, and Gogate, V. (2020). Investigating the Importance of First Impressions and Explainable AI with Interactive Video Analysis. In *Extended Abstracts of the 2020 CHI Conference on Human Factors in Computing Systems* (ACM CHI 2020). pp. 1-8.

3. Kum, HC and **Ragan, E.** (2019). Exploring the Use of Interactive Interfaces and Feedback Mechanisms to Enhance Privacy in Data Workers through Information Accountability. *Workshop on Security Information Workers* (WSIW 2019).

4. Roy, C., Nourani, M., Shanbhag, M., Kabir, S., Rahman, T., **Ragan, E.,** Ruozzi, N. and Gogate, V. (2019). Explainable Activity Recognition in Videos using Dynamic Cutset Networks. *3rd Workshop of Tractable Probabilistic Modeling* (TPM 2019).

5. Xu, Q. and **Ragan, E.** (2019). Effects of Character Guide in Immersive Virtual Reality Stories. Virtual, Augmented and Mixed Reality. Multimodal Interaction. HCII 2019. Lecture Notes in Computer Science, vol 11574. Springer. doi: 10.1007/978-3-030-21607-8_29

6. Peña, A., **Ragan, E.,** and Kang, J. (2019). Designing Educational Virtual Environments for Construction Safety: A Case Study in Contextualizing Incident Reports and Engaging Learners. Virtual, Augmented and Mixed Reality. Applications and Case Studies. HCII 2019. *Lecture Notes in Computer Science*, vol 11575. Springer. doi: 10.1007/978-3-030-21565-1_23

7. Roy, C., Shanbhag, M., Rahman, T., Gogate, V., Ruozzi, N., Nourani, M., **Ragan, E.**, and Kabir, S. (2019). Explainable Activity Recognition in Videos. *Workshop on Explainable Smart Systems* (ExSS), ACM Intelligent User Interfaces (IUI) Workshops 2019.

8. Peña, A., Nirjhar, E. H., Pachuilo, A., Chaspari, T., and **Ragan, E**. (2019). Detecting Changes in User Behavior to Understand Interaction Provenance during Visual Data Analysis. *User Interactions for Building Knowledge (UIBK) Workshop*, ACM Intelligent User Interfaces (IUI) Workshops 2019.

9. Yang, F., Pentyala, S. K., Mohseni, S., Du, M., Yuan, H., Linder, R., **Ragan, E**., Ji, S., and Hu, X. (2019). XFake: Explainable Fake News Detector with Visualizations. *2019 Web Conference (WWW)*. Demonstrations track.

10. Giannouchos, T., Kum, H.-C., Ferdinand, A., Schmit, C., Ilangovan, G., and **Ragan, E**. (2018). Patients' and Stakeholders' Perceptions of Risk and Benefits of the Privacy Preserving Interactive Record Linkage (PPIRL) Framework. Poster accepted at the Advanced Ethical Research (AER) Conference, 2018, San Diego, CA.

11. Schmit, C., Kum, H.-C., **Ragan, E.**, Ferdinand, A., and Giannouchos, T. (2018). Trusted Third Party Software Approach to Facilitate Data Disclosures Governed by "Minimum Necessary" Legal Standards in Record Linkage Studies. American Public Health Association (APHA). San Diego, CA.

12. Giannouchos T., Kum, H.-C, Ferdinand, A., Schmit, C., Ilangovan, G., **Ragan, E.** (2018). Patients' and Stakeholders' Perceptions of Risk and Benefits of the Privacy Preserving Interactive Record Linkage (PPIRL) Framework. AcademyHealth Annual Research Meeting (ARM). Seattle, WA.

13. Kum, HC, Ilangovan, G., Li, Q., Li, Y., and **Ragan, E**. (2018). An effective privacy enhanced interface to support record linkage decisions. Extended abstract. International Journal of Population Data Science. doi: 10.23889/ijpds.v3i4.889

14. Stebbins, T. and **Ragan, E.** (2018). Redirected Scene Rotation for Immersive Movie Experiences. Extended abstract. In Proceedings of IEEE Virtual Reality 2018.

15. Linder, R., Stacy, A., Lupfer, N., Kerne, A., and **Ragan, E.** (2018). Pop the Feed Filter Bubble: Making Reddit Social Media a VR Cityscape. Extended abstract. In Proceedings of IEEE Virtual Reality 2018.

16. Suhail, M., Sargunam, S., Han, D., and **Ragan, E.** (2018). Physical Hand Interaction for Controlling Multiple Virtual Objects in Virtual Reality. Workshop paper. In Proceedings of IWISC 2018: 3rd International Workshop on Interactive and Spatial Computing.

17. Sargunam, S. and **Ragan, E.** (2018). Evaluating Joystick Control for View Rotation in Virtual Reality with Continuous Turning, Discrete Turning, and Field-of-view Reduction. Workshop paper. In Proceedings of IWISC 2018: 3rd International Workshop on Interactive and Spatial Computing.

18. Hicks, D., Johnson, A., Ogle, T., van Hover, S., **Ragan, E.**, Bowman, D., and Tucker, T. (2017). Making the Invisible Visible: Evaluating the Use of Mixed Reality to Teach a Forgotten Local History - School Segregation - with 5th Graders. Paper presented at the annual meeting of the College and University Faculty Assembly of the NCSS. San Francisco. **Award winner**: Society for Information Technology and Teacher Education/National Technology Leadership Initiative Award.

19. Mohseni, S., Peña, A., and **Ragan, E.** (2017). ProvThreads: Analytic Provenance Visualization and Segmentation. Extended poster abstract. In *Proceedings of IEEE VIS 2017*.

20. Tang, F., McMahan, R., **Ragan, E.** and Allen, T. (2017). Subjective Evaluation of Tactile Fidelity for Single-Finger and Whole-Handed Touch Gestures. Conference paper. *Proceedings of HCI International 2017*. Springer.

21. Moghadam, K. and **Ragan, E.** (2017). Towards Understanding Scene Transition Techniques in Immersive 360 Movies and Cinematic Experiences. Extended poster abstract. In *Proceedings of IEEE Virtual Reality 2017*.

22. Suhail, M., Sargunam, S., Han, D., and **Ragan, E.** (2017). Redirected Reach in Virtual Reality: Enabling Natural Hand Interaction at Multiple Virtual Locations with Passive Haptics. Extended poster abstract. In *Proceedings of IEEE Symposium on 3D User Interfaces 2017*.

23. Han, D., Sargunam, S., and **Ragan, E.** (2017). Simulating Anthropomorphic Upper Body Actions in Virtual Reality using Head and Hand Motion Data. Extended poster abstract. In *Proceedings of IEEE Virtual Reality 2017*.

24. Peña, A. and **Ragan, E.** (2017). Contextualizing Construction Accident Reports in Virtual Environments for Safety Education. Extended poster abstract. In *Proceedings of IEEE Virtual Reality 2017*.

25. Brown, C., Bhutra, G., Suhail, M., Xu, Q., and **Ragan, E.** (2017). Coordinating Attention and Cooperation in Multi-user Virtual Reality Narratives. Extended poster abstract. *In Proceedings of IEEE Virtual Reality 2017*.

26. Linder, R., Peña, A., Jayarathna, S., and **Ragan, E.** (2016). Results and Challenges in Visualizing Analytic Provenance of Text Analysis Tasks Using Interaction Logs. *Logging Interactive Visualizations and Visualizing Interaction Logs (LIVVIL) Workshop* at IEEE VIS 2016.

27. Pachuilo, A., **Ragan, E.**. and Goodall, R. (2016). Leveraging Interaction History for Intelligent Configuration of Multiple Coordinated Views in Visualization Tools. *Logging Interactive Visualizations and Visualizing Interaction Logs (LIVVIL) Workshop* at IEEE VIS 2016.

28. Hicks, D., Ogle, T., Bowman, D., Cline, D., **Ragan, E.,** and Tucker, T. (2016) Supporting disciplined inquiry with mobile Augmented Reality. *2016 AECT International Convention*. Las Vegas, Nevada.

29. Johnson, A., Hicks, D., Bowman, D., Cline, D., Ogle, T., Singh, G., Zlokas, R., and **Ragan, E.** (2015). Augmented reality, junior detectives, and the c3 inquiry arc. National Council of Social Studies Annual Conference.

30. Hicks, D., Ogle, T., Bowman, D., Cline, D., **Ragan, E.,** Singh, G., Johnson, A., & Zlokas, R. (2015). Reflection on action: Mode 2 knowledge production and the development of mobile augmented reality for scaffolding historical inquiry. Invited demonstration at the Applied Research in Immersive Environments for Learning SIG at the annual conference of the American Educational Research Association.

31. Zlokas, R., Johnson, A., Cline, D., Bowman, D., Singh, G., Ogle, T., Hicks, D., and **Ragan, E.** (2015). Using augmented reality to help teach elementary school history. National Council on Public History Annual Meeting.

32. Johnson, A., McPherson, K., Ogle, T., Hicks, D., Cline, D., Bowman, D., Singh, G., Zlokas, R., and **Ragan, E.** (2015). New digital technologies and local history: Making the past visible. Virginia Council for Social Studies.

33. Lukasczyk, J., Liang, X., Luo, W., Middel, A., **Ragan, E.**, Bliss, N., White, D., Hagen, H., and Maciejewski, R. (2015). A Collaborative Web-Based Environmental Data Visualization and Analysis Framework. Workshop paper. *Proceedings of the Workshop on Visualization in Environmental Science (EnvirVis Workshop)*. Workshop at EuroVis, 2015. Eurographics.

34. Tang, F. McMahan, R., **Ragan, E.**, and Allen, T. (2015). Subjective Evaluation of Tactile Fidelity for Simple and Complex Touch Gestures. Poster presentation. In *IEEE Virtual Reality Conference* (IEEE VR 2015).

35. **Ragan, E.** and Goodall, J. (2014). Evaluation methodology for comparing memory and communication of analytic processes in visual analytics. *Beyond Time and Errors: Novel Evaluation Methods for Visualization* (BELIV Workshop 2014). Workshop at IEEE VIS 2014. ACM.

36. Singh, G., Bowman, D., Hicks, D., Cline, D., Ogle, J., Johnson, A., Zlokas, R., **Ragan, E.** (2014). CI-Spy: Using Mobile-AR for Scaffolding Historical Inquiry Learning", International Symposium on Mixed and Augmented Reality (ISMAR 2014). Poster presentation. IEEE Computer Society.

37. Smith, D., Chung, H., **Ragan, E.**, Self, J., North, C., and Cate, A. (2013). Spatial and semantic memory for kinesthetic learning in large-scale visual displays. Poster presentation. Society for Neuroscience 2013. San Diego, California.

38. Bowman, D., McMahan, R., Stinson, C., **Ragan, E.**, Scerbo, S., Hollerer, T., Lee, C., and Kopper, R. (2011). Evaluating Effectiveness in Virtual Environments with MR Simulation. *Marine Corps Warfighting Laboratory Workshop*.

39. **Ragan, E.**, Wilkes, C., Cao, Y., and Bowman, D. (2012). The Effects of Virtual Character Animation on Spatial Judgments. Poster presentation. In Proceedings of the 2012 *IEEE Virtual Reality Conference*. Orange County, CA. IEEE Computer Society.

40. Bacim, F., **Ragan, E.**, Stinson, C., Scerbo, S., and Bowman, D. (2012). Collaborative Navigation in Virtual Search and Rescue. Research competition entry (3DUI Contest 2012). In Proceedings of the 2012 *IEEE Symposium on 3D User Interfaces*. IEEE Computer Society. **Award winner**: First Place contest award. **Award winner**: Popular Choice Award.

41. Stinson, C., Kopper, R., Scerbo, B., **Ragan, E.**, and Bowman, D. A. (2011). The Effects of Visual Realism on Training Transfer in Immersive Virtual Environments. Poster presentation. *Human Systems Integration Symposium* 2011. Vienna, VA. **Award winner:** best poster.

42. **Ragan, E.**, Endert, A., Bowman, D., and Quek, F. (2011). The Effects of Spatial Layout and View Control on Cognitive Processing. In Proceedings of the 2011 ACM CHI Conference on Human Factors in Computing Systems, *CHI Works in Progress*. 2005 – 2010. Vancouver, BC. ACM.

43. **Ragan, E.**, Logan, K., Bowman, D., Antol, J., and Brewster, P. (2010). Immersive Virtual Environments for Human Exploration. Poster presentation. In Proceedings of *National Space & Missile Materials Symposium* 2010. Scottsdale, AZ.

44. **Ragan, E.**, Brewster, P., and Antol, J. (2010). Immersive Virtual Environments for Human Exploration and Collaboration. Conference exhibition. *Modeling and Simulation World Conference and Expo* 2010. Hampton, VA.

45. **Ragan, E.**, Wilkes, C., Bowman, D. A., and Hollerer, T. (2009). Simulation of Augmented Reality Systems in Purely Virtual Environments. Poster presentation. In Proceedings of the 2009 *IEEE Virtual Reality Conference* (pp. 287-288). Lafayette, LA. IEEE Computer Society.

Other Publications

1. McMahan, R., **Ragan, E.**, Bowman, D., Tang, F., and Lai, C. FIFA: The Framework for Interaction Fidelity Analysis. (2015). University of Texas at Dallas Technical Report. UTDCS-06-15.

2. Bebis, G., Boyle, R., Parvin, B., Koracin, D., Pavlidis, I., Feris, R., McGraw, T., Elendt, M., Kopper, R., **Ragan, E.**, Ye, Z., Weber, G. (Eds.) (2015). Advances in Visual Computing 11th International Symposium, ISVC 2015, Las Vegas, NV, USA, December 14-16, 2015, Proceedings.

3. **Ragan, E.** (2013). Supporting Learning through Spatial Information Presentations in Virtual Environments. Virginia Tech. Doctoral Dissertation.

4. **Ragan, E.**, Huber, K., Bowman, D. (2011). Supporting Memorization and Problem Solving with Spatial Information Presentations in Virtual Environments. Virginia Tech Computer Science Technical Report TR-11-18.

5. **Ragan, E.** (2011). Supporting Problem Solving with Spatial Information Displays. In T. Smith-Jackson and T. Coalson (Eds.). ISE 5604: Human Information Processing Scholar Series 2009-4. TR# VT-ISE-ACE2009-4, pp. 1 - 7.

SELECTED INVITED TALKS

- Balancing Naturalness, Convenience, and Comfort for Interaction Technique in Virtual Reality (2018). Invited talk at National Renewable Energy Laboratory (NREL).
- Automating the Capture and Visualization of Analytic Provenance (2017). Invited talk at International Workshop on Interactive and Spatial Computing (IWISC 2017).
- Interactive Computing with Virtual Reality (2015). Invited talk at International Workshop on Interactive and Spatial Computing (IWISC 2015).
- Understanding the Role of Realism in Virtual Reality Training Systems (2014). University of Tennessee. Invited talk at Center for Intelligent Systems and Machine Learning (CISML) seminar.
- A Human-Centered Approach to Studying the Spatial Visualization of Non-Spatial Information (2013). Duke University. Invited talk at Friday Visualization Forum.

RESEARCH APPOINTMENT HISTORY

University of Florida, Department of Computer & Information Science & Engineering
(Gainesville, FL)
August 2018 – Present
Assistant Professor

Texas A&M University, Department of Visualization (College Station, TX)
August 2015 – August 2018
Assistant Professor

Oak Ridge National Laboratory,
Computational Sciences & Engineering Division (Oak Ridge, TN)
August 2013 – July 2015
Research Scientist

Virginia Tech, Department of Computer Science (Blacksburg, VA)
May 2011 – August 2013
Graduate Research Assistant

NASA Langley Research Center, Space Mission Analysis Branch (Hampton, VA)
Virginia Tech, Department of Materials Science and Engineering (Blacksburg, VA)
August 2009 — May 2011
National Institute of Aerospace Graduate Research Assistant

Gannon University, Department of Environmental Science (Erie, PA)
December 2005 – May 2006
Student Research Assistant

TEACHING EXPERIENCE

University of Florida, (Gainesville, FL)
Assistant Professor

- Information Visualization (CIS 6930) – Fall 2019
- Human-Computer Interaction (CAP 5100) – Spring 2019

Texas A&M University, (College Station, TX)
Assistant Professor

- Data Visualization (VIST 489, VISA 689, CSCE 689) – Spring 2017; Spring 2018
- Virtual Reality (VIST 489, CSCE 489, VISA 689, CSCE 689) – Fall 2016; Fall 2017
- Visual Studies Studio (VIST 405) – Spring 2016
- Information Visualization (VIST 489, VISA 689) – Fall 2015

Virginia Tech, (Blacksburg, VA)
Summer Teaching Faculty

- Summer 2012. CS 1054/1114 – Introduction to Programming in Java; Introduction to Software Design

Graduate Teaching Assistant

- Spring 2012. CS 1114 – Introduction to Software Design. Responsible for leading lab sessions, assisting students during office hours, and giving occasional lectures.
- Spring 2008. CS 2606 – Data Structures and Object-Oriented Development II. Responsible for assisting students during office hours and grading.

STUDENT ADVISING

Current PhD Students
- Sina Mohseni, Computer Science (Texas A&M University)
- Mahsan Nourani, Computer Science (University of Florida)
- Shaghayegh Esmaeili, Human-Centered Computing (University of Florida)
- Jeremy Block, Human-Centered Computing (University of Florida)
- Donald Honeycutt, Computer Science (University of Florida)
- Dhrubo Paul, Computer Science (University of Florida)
- Brett Benda, Human-Centered Computing (University of Florida)

Completed MS Theses
- Suhail Mohamed, MS Visualization, Texas A&M University (Masters thesis, 2018)
- Shyam Prathish Sargunam, MS Visualization, Texas A&M University (Masters thesis, 2018)
- Dustin Han, MS Visualization, Texas A&M University (Masters thesis, 2017)
- Alyssa Peña, MS Visualization, Texas A&M University (Masters thesis, 2017)
- Qinghong Xu, MS Visualization, Texas A&M University (Masters thesis, 2018)

Completed Undergraduate Theses
- Kasra Rahimi, BS Computer Science, Texas A&M University (Undergraduate thesis, 2017)
- Travis Stebbins, BS Visualization, Texas A&M University (Undergraduate thesis, 2018)

Other Research Mentoring
- Ezekiel Ajayi, BS Computer Science (University of Florida undergraduate research, 2019)
- Talha Khan, BS Computer Science (University of Florida undergraduate research, 2019)
- Irelis Suarez, BS Computer Science (University of Florida, undergraduate research, 2019)
- Karthic Madanagopal, PhD Computer Science (Texas A&M University, 2018-2019)
- Ryan Canales, BS Visualization (Texas A&M University, undergraduate research, 2017)
- Kyle Rowland, BS Computer Science (Texas A&M University, undergraduate research, 2017)
- Han Wang, PhD Computer Science (Texas A&M University, research hours, 2016-2017)
- Shelby Lockhart (Oak Ridge National Laboratory undergraduate research internship, 2015)
- Kumar Sridharamurthy, MS Visualization (Texas A&M University, independent study, 2015)
- Andrew Pachuilo (Oak Ridge National Laboratory undergraduate research internship, 2015)
- Kyle Leinart (Oak Ridge National Laboratory undergraduate research internship, 2014-2015)
- Andrew Stamps (Oak Ridge National Laboratory graduate research internship, 2014)
- Albert Tung (Oak Ridge National Laboratory undergraduate research internship, 2014)
- Evan West (Oak Ridge National Laboratory undergraduate research internship, 2014)

INDUSTRY EXPERIENCE

Schell Games (Pittsburgh, PA)
May 2008 – August 2008; May 2009 – August 2009

Intern Game Engineer
- Designed and prototyped gameplay mechanics and interaction methods with teams of artists, producers, and programmers.
- Conducted usability and play-testing sessions for game prototypes.

Virginia Tech, College of Engineering (Blacksburg, VA)
August 2008 – May 2009

Software Support Manager
- Managed software support team serving student and faculty computing issues.
- Managed equipment inventory for the Virginia Tech College of Engineering.

Hamot Medical Center, Information Management and Data Analysis Systems (Erie, PA)
May 2006 – January 2008

Information Management and Data Analysis Systems Programmer
- Designed and developed multiple data-driven systems to manage patient and employee information.
- Worked with hospital employees to develop system solutions, create databases, design user interfaces, and engineer software applications.
- Designed and developed the organization's first public online system for reporting internal data trends and metrics.

SERVICE ACTIVITIES

Conference Service
- Program committee: IEEE Virtual Reality conference (IEEE VR) (2015, 2016, 2017, 2020)
- Program committee: ACM Spatial User Interaction (SUI) (2019)
- Program committee: IEEE Visual Analytics Science and Technology (VAST) (2017, 2018)
- Program committee: Workshop on Immersive Analytics at IEEE VIS (2017)
- Organizing committee: IEEE Virtual Reality (IEEE VR) (2014, 2016, 2017)
  (2014 student volunteer chair, 2016 demo chair, 2017 demo chair)

- Workshop chair: Mixed Reality Art Workshop (MRA) at IEEE Virtual Reality (2016)
- Program committee: IEEE Symposium on Visualization for Cyber Security (VizSec) (2015, 2016)
- Program committee: ACM Symposium on Virtual Reality Software and Technology 2015 (VRST 2015)
- Virtual Reality Area Chair: International Symposium on Visual Computing (ISVC 2015)
- Program committee: International Symposium on Visual Computing (ISVC) (2014, 2015)

Reviewer and Editor Service

- Associate Editor: International Journal of Human-Computer Studies (IJHCS) (2015-present)
- Guest Editor: Frontiers in Robotics and AI: Virtual Environments. Special issue in Virtual and Augmented Reality for Education and Training (2016)
- Reviewer for NSF (multiple)
- Regular reviewer for journals (ongoing): IEEE Transactions on Visualization and Computer Graphics (TVCG); International Journal of Human-Computer Studies (IJHCS)
- Regular reviewer for conferences (ongoing): IEEE Virtual Reality (VR); IEEE Conference on Visual Analytics Science and Technology (IEEE VAST); IEEE Symposium on 3D User Interfaces (IEEE 3DUI); IEEE Information Visualization Conference (IEEE InfoVis); ACM Symposium on Spatial User Interaction (ACM SUI); ACM Conference on Human Factors in Computer Systems (ACM CHI)
- Reviewer for journals (previous): ACM Transactions on Applied Perception; Computers & Education; Frontiers Virtual Environments; IEEE Journal of Selected Topics in Signal Processing; Perceptual and Motor Skills; The Visual Computer
- Reviewer for conferences (previous): Cyber and Information Security Research Conference (CISR); Eurographics Joint Virtual Reality Conference (JVRC);