Francisco Raúl Ortega
Curriculum Vitae

Updated 1/6/2026

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SECTION 1: Employment History/Awards

EDUCATION

Florida International University — Miami, FL
Ph. D. in Computer Science — *Fall 2014*
Title: *3D Navigation with Six Degrees-of-Freedom Using a Multi-Touch Display*
Advisors: Dr. Armando Barreto and Dr. Naphtali Rishe

Florida International University — Miami, FL
M. S. in Computer Science — *Fall 2008*

Florida International University — Miami, FL
B. S. in Computer Science – Cum Laude — *Fall 2007*

PROFESSIONAL APPOINTMENTS

- Associate Professor (tenured), Director of NUI Lab, Department of Computer Science, Colorado State University, July 1 2024 – Present.
- Associate Professor (Courtesy Appointment), Richardson Design Center, Colorado State University, July 1 2024 – Present.
- Assistant Professor, Director of NUI Lab, Department of Computer Science, Colorado State University, August 16, 2018 – June 30, 2024.
- Assistant Professor (Courtesy Appointment), Richardson Design Center, Colorado State University, August 16, 2018 – June 30, 2024.
- Assistant Professor (Courtesy Appointment), Systems Engineering, Colorado State University, Fall 2020 – Fall 2023.
- Assistant Professor (Courtesy Appointment), Florida International University, Fall 2018 – Summer 2021.
- Visiting Assistant Professor, Director of OpenHID Lab, Florida International University, Fall 2016 – Summer 2018.
- Vertically Integrated Projects (VIP) Coordinator, Florida International University, Spring 2016 – Spring 2018.
- Visiting PostDoc Fellow, Director of OpenHID Lab, Florida International University, Spring 2015 – Summer 2016.

OTHER POSITIONS (ADDITIONAL WORK EXPERIENCE)

- Research & Teaching Assistant, Florida International University, Spring 2009 – Fall 2014.
- Software Engineer, IBLUES Corporation, Fall 1999 – Fall 2014
- Operator & Asst. SysAdmin, Tecnicard, Inc., Spring 1994 – Fall 1999

CURRENT JOB DESCRIPTION

Associate Professor. Tenured. Department of Computer Science.

40% Teaching. 50% Research/Creative Activity. 10% Service/Outreach. 0% Admin.

HONORS AND AWARDS

- CNS College nominated for Monfort Professorship 2025–2026.
- 🏆 IEEE VR 2024 Best Poster Award. Aging Naturally: Virtual reality nature vs real-world nature's effects on executive functioning and stress recovery in older adults. Sara LoTemplio, Sharde Johnson, Michaela Rice, Rachel Masters, Sara-Ashley Collins, Joshua Hofecker, Jordan Rivera, Dylan Schreiber, Victoria Interrante, **Francisco Raul Ortega**, and Deana Davalos.
- 🏆🏆 NSF CAREER (Dec 24th, 2022 for funding starting in 2023).
- 🏆 Best Student Paper Award, The Human Performance Modeling technical group. In *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*. Effects of Color Commonality of Overlay Clutter and Information Access Effort on Tasks Requiring Visual Search. Warden, A. C., Wickens, C. D., Clegg, B. A., and **Ortega, F.** 2023.
- 🏆 Best Student Paper Award, Information Access Costs with a Wide-Angle Desktop Display. In *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*. The Perception and Performance technical group. Poole, C. A., Warden, A. C., Wickens, C. D., Raikwar, A., Clegg, B. A., and **Ortega, F.** 2023.
- 🏆 Best Student Paper Awards, Virtual Environments TG Best Student Paper Award. Human Factors and Ergonomics Society 66th Annual Meeting (Conference). Awarded for Information Access Effort: Are Head Movements "Cheap" or Even "Free"? to authors Warden, A. C., Wickens, C. D., Mifsud, D., Ourada, S., Clegg, B. A., and **Ortega, F.** 2022.
- 🏆 Best Demo Award, International Conference on Artificial Reality and Telexistence Eurographics Symposium on Virtual Environments (ICAT-EGVE). Situational Awareness in Human Computer Interaction: Diana's World. Shared with other co-authors (see publications). 2020.
- Nominated for College of Engineering Dissertation of the Year Award, 2014.
- Best Overall Graduate Student of the School of Computing and Information Sciences Year Award, 2014.
- Microsoft and Tapia Conference Gaming Code-A-Thon First Prize: Xbox ONE ($500.00), 2014.

- $986.00 Tapia Conference Scholarship Award, 2014.
- $350.00 US Dollars ACM I3D 2013 conference stipend, 2013.
- Ph.D. GAANN Fellowship awarded by the US Department of Education, 4 years.
- McKnight Dissertation Fellowship awarded by Florida Education Fund, 4 semesters.
- *Cum Laude* honors for Bachelor in Computer Science, 2007.

SECTION 2: Publications/Scholarly Record

PUBLICATION SUMMARY

The following is a summary of the overall publication record:

- **Overall**: 3 books, 24 journals, 2 book chapters, 48 conference articles, 24 workshop articles, 22 poster articles, 4 demos, 1 conference course, 1 other referred article, 2 magazine articles, and 5 invited papers.

PUBLICATIONS

Legend: Publications co-authored with my CSU students are denoted by a **dagger** (†). Publications co-authored with students I have advised or mentored, formally or informally, at other institutions—primarily former students at Florida International University—are denoted by a **double dagger** (‡). Markings indicate students who have been under my supervision (as advisor, co-advisor, or principal investigator) or who received mentoring from me. Additional information about the publications is included at the end of the citation, enclosed by brackets ([]). The acceptance rate for papers is denoted by **AR**. The impact factor is denoted by **IF**. The 5-Year impact factor is denoted by **5-IF**. Citation count is denoted by **CC**. All categories are sorted by year in descending order. Publications last updated: 06/28/2026. A note about preprints. If the preprint has not been reviewed and accepted, it is listed in the preprint section and does not count as a peer-reviewed publication. However, in some cases (e.g., workshops), a preprint is available and has been reviewed and accepted.

Books

B.3 Williams, A. S.†and **Ortega, F. R.** (2021). A Concise Guide to Elicitation Methodology. Access: https://arxiv.org/abs/2105.12865. Fort Collins, CO. Open Access. **[CC: 12]**.

B.2 Barreto, A., Adjouadi, M., **Ortega, F. R.**, and O-larnnithipong, N. (2020). Intuitive Understanding of Kalman Filtering Using MatLab. CRC Press, New York, NY. ISBN-13: 978-0367191337. **[CC: 12]**.

B.1 **Ortega, F. R.**, Abyarjoo, F., Barreto, A., Rishe, N., and Adjouadi, M. (2016). Interaction Design for 3D User Interfaces: The World of Modern Input Devices for Research, Applications, and Game Development. CRC Press/AK Peters, New York, NY. ISBN-13: 978-1482216943. **[CC: 35]**.

Refereed Journal Articles

J.24 Borhani, Z.†, Holen, E.†, Williams, A. S.†, Barrera Machuca, M. D., Batmaz, A. U., Kelley, B.†, Zhou, X.†, Rhodes, M. G., and **Ortega, F. R.** (2026). Recall This Gesture? Investigating Gesture Memorability in Extended Reality. In *IEEE Transactions on Visualization and Computer Graphics*, vol. 32, no. 7, pp. 6215–6225. DOI: https://doi.org/10.1109/TVCG.2026.3678203.

J.23 Poole, C. A.†, Warden, A. C.†, Wickens, C. D., Raikwar, A.†, Clegg, B. A., Buckman, M.†, & **Ortega, F. R.** (2025). Information Access Costs With an Augmented Reality Head-Mounted Display. Human Factors: The Journal of the Human Factors and Ergonomics Society, 0(0). DOI: https://doi.org/10.1177/00187208251377311. **[IF: 3.3, 5-IF: 4.6, CC: 1]**.

J.22 Plabst, L.†, Niebling, F., Oberdörfer, S., and **Ortega F. R**. Order Up! Multimodal Interaction Techniques for Notifications in Augmented Reality. in *IEEE Transactions on Visualization and Computer Graphics*, vol. 31, no. 5, pp. 2258-2267, May 2025, doi: 10.1109/TVCG.2025.3549186. **[IF: 6.5, CC: 8]**.

J.21 Spitzer, A. N.†, Ramey, M. R., Yu, Y. "Skylar", Oselinsky, K. M., McMahon, K., Kelley, B., Rojas-Rueda, D., Dean, D., LoTemplio, S. B., **Ortega, F. R.**, & Graham, D. J. (2025). Walking in an Urban Environment and a Virtual Reality Replica: Comparisons of Physical Activity Duration and Intensity. Transportation Research Record: Journal of the Transportation Research Board, 0(0). DOI: https://doi.org/10.1177/03611981251365899. **[IF: 1.8, 5-IF: 2.1, CC: 1]**.

J.20 Zhou, X.†, Lee, B., **Ortega, F. R.**, Batmaz, A. U., and Yang, Y. (2024). Lights, Headset, Tablet, Action: Exploring the Use of Hybrid User Interfaces for Immersive Situated Analytics. In *Proceedings of ACM Human-Computer Interaction, Presented at Interactive Surfaces and Spaces Conference 2024.* 8, ISS, Article 5470, 23 pages. DOI: https://doi.org/10.1145/3698147. **[5-IF: 4.5, CC: 5]**.

J.19 Warden, A. C.†, Wickens, C. D., Clegg, B. A., Rehberg, D.†, and **Ortega, F. R.** (2024). Information Access Effort: The Role of Head Movements for Information. In *Human Factors.* 66(8), 2057-2081. Presented at Increasing Eccentricity on Flat Panel and Head-Mounted Displays. DOI: https://doi.org/10.1177/00187208231204567. **[IF: 2.9, CC: 6]**.

J.18 Warden, A. C.†, Wickens, C. D., Clegg, B. A., and **Ortega, F. R.** (2024). Quantitative effects of overlay clutter and information access effort: Examining the scan-clutter tradeoff in displays with geospatial maps. In *Journal of Experimental Psychology: Applied*, 30(4), 607–630. DOI: https://doi.org/10.1037/xap0000512. **[IF: 2.7, CC: 4]**.

J.17 Raikwar, A.†, Mifsud, D.†, Wickens, C., Batmaz, A. U., Warden, A., and Kelley, B.†, Clegg, B. A., and **Ortega, F. R**. (2024). Beyond the Wizard of Oz: Negative Effects of Imperfect Machine Learning to Examine the Impact of Reliability of Augmented Reality Cues on Visual Search Performance. *In IEEE Transactions on Visualization and Computer Graphics*, vol. 30, no. 5, pp. 2662-2670. DOI: https://doi.org/10.1109/TVCG.2024.3372062. **[IF: 4.7, CC: 12]**.

J.16 Masters, R.†, Nicoly, J.†, Gaddy, V.†, Interrante, V., and **Ortega F. R**. (2024). The Impact of Nature Realism on the Restorative Quality of Virtual Reality Forest Bathing. *In ACM Transactions of Applied Perception (TAP)*. 22, 1, Article 3, 18 pages. Accepted (June 2024). DOI: https://doi.org/10.1145/3670406. November, 2024. **[IF: 1.9, CC: 8]**.

J.15 Scolere, L., Malinin, L. H., and **Ortega, F. R**. (2023). Co-designing augmented reality: exploring the role of boundary negotiating artifacts. In *International Journal of CoCreation in Design and the Arts*. Taylor & Francis Online. pp. 1 – 20. DOI: https://doi.org/10.1080/15710882.2023.2255169. **[IF: 2.0, 5-IF: 2.1, CC: 3]**.

J.14 Warden, A. C.†, Wickens, C. D., Rehberg, D.†, **Ortega, F. R.**, Clegg, B.A. (2023). Fast, Accurate, but Sometimes Too-Compelling Support: The Impact of Imperfectly Automated Cues in an Augmented Reality Head-Mounted Display on Visual Search Performance. In *IEEE Transactions on Human-Machine Systems*, pp. 1 – 12. DOI: https://doi.org/10.48550. **[IF: 4.124, CC: 18]**.

J.13 Borhani Z.†, Sharma P.†, and **Ortega, F. R.** (2023). Survey of Annotations in Extended Reality Systems. In *IEEE Transactions on Visualization and Computer Graphics*. DOI: https://doi.org/10.1109/TVCG.2023.3288869. **[IF: 5.226, CC: 19]**.

J.12 Wickens, C. D., Mifsud, D.†, Rodriguez, R.†, and **Ortega, F. R.** (2023). Mitigating the costs of spatial transformations with a situation awareness augmented reality display: Assistance for the Joint Terminal Attack Controller. SAGE, pp. 3–17. In *Human Factors: The Journal of the Human Factors and Ergonomics Society. SAGE*. DOI: https://doi.org/10.1177/00187208211022468. **[IF: 3.598, 5-IF: 4.212, CC: 7]**.

J.11 Oselinsky, K., Spitzer, A. N, Yu, Y., **Ortega, F. R.**, Malinin, L. H., Curl, K. A., Leach, H., Graham, D. J. (2023). Virtual reality assessment of walking in a modifiable urban environment: a feasibility and acceptability study. 13, 5867. In *Scientific Reports*. DOI: https://doi.org/10.1038/s41598-023-32139-w. **[IF: 4.997, CC: 13]**.

J.10 Williams, A. S.†, and **Ortega, F. R**. (2022). The Impacts of Referent Display on Gesture and Speech Elicitation. In *IEEE Transactions on Visualization and Computer Graphics*. IEEE vol. 28, iss. 11. (September 2022), pp. 3885-3895. DOI: https://doi.org/10.1109/TVCG.2022.3203090. **[IF: 5.226, AR: 26.6%, CC: 9]**.

J.9 Wang, H.†, Gaddy, V.†, Beveridge, J. R., and **Ortega, F. R**. (2021). Building an Emotionally Responsive Avatar with Dynamic Facial Expressions in Human—Computer Interactions. MDPI vol. 5, iss. 3. (March 2021), pp. 1–13. In *Multimodal Technologies and Interaction*. DOI: https://doi.org/10.3390/mti5030013 . **[IF: 3.08, CC: 27]**.

J.8 Silva-Calpa, G. F. M., Raposo, A. B., and **Ortega, F. R.** (2021). Collaboration Support in Co-located Collaborative Systems for Users with Autism Spectrum Disorders: A Systematic Literature Review. Taylor & Francis Online vol. 37, iss. 1. (January 2021), pp. 15–35. In *International Journal of Human-Computer Interactions*. DOI: https://doi.org/10.1080/10447318.2020.1801224. **[IF: 4.9, CC: 7]**.

J.7 Williams, A. S.†, Garcia, J.†, De Zayas, F.‡, Hernandez, F.‡, Sharp, J., and **Ortega, F. R.** (2020). The Cost of Production in Elicitation Studies and the Legacy Bias-Consensus Trade off. MDPI vol. 4, iss. 4. (December 2020), pp. 1–88. In *Multimodal Technologies and Interaction*. DOI: https://doi.org/10.3390/mti4040088. **[IF: 2.3, CC: 13]**.

J.6 Williams, A. S.[†], Garcia, J.[†], and **Ortega, F. R.** (2020). Understanding Multimodal User Gesture and Speech Behavior for Object Manipulation in Augmented Reality Using Elicitation. IEEE vol. 26, iss. 12. (December 2020), pp. 3479–3489. In *IEEE Transactions on Visualization and Computer Graphics*. DOI: https://doi.org/10.1109/TVCG.2020.3023566. [**IF: 5.226, AR: 6%, CC: 91**].

Erratum (2022): IEEE Transactions on Visualization and Computer Graphics, 28(7), 2808. DOI: https://doi.org/10.1109/TVCG.2022.3164438.

J.5 Williams, A. S.[†]and **Ortega, F. R**. (2020). Understanding Gesture and Speech Multimodal Interactions for Manipulation Tasks in Augmented Reality Using Unconstrained Elicitation. ACM vol. 4, iss. ISS. (November 2020), pp. 1–21. In *Proceedings of the ACM on Human-Computer Interaction*. DOI: https://doi.org/10.1145/3427330. **[IF: 4.568, AR: 28%, CC: 40]**.

J.4 **Ortega, F. R.**, Williams, A. S.[†], Tarre, K.[‡], Barreto, A. and Rishe, N. (2020). 3D Travel Comparison Study between Multi-Touch and GamePad. Taylor & Francis vol. 36, iss. 18. (November 2020), pp. 1699–1713. In *International Journal of Human-Computer Interaction*. DOI: https://doi.org/10.1080/10447318.2020.1780016. **[IF: 4.920, CC: 5]**.

J.3 Vieira, E. R., Civitella, F., Carreno, J., Junior, M. G., Amorim, C. F., D'Souza, N., Ozer, E., **Ortega, F. R.**, and Estrázulas, J. A. (2020). Using Augmented Reality with Older Adults in the Community to Select Design Features for an Age-Friendly Park: A Pilot Study. Hindawi vol. 2020, Article ID 8341034. (September 2020), pp. 1–8. In *Journal of Aging Research*. DOI: https://doi.org/10.1155/2020/8341034. **[IF: 2.381, CC: 11]**.

J.2 Coffino, J., Barreto, A., Abyarjoo, F., and **Ortega, F. R**. (2014). Sonically-Enhanced Tabular Screen-Reading. vol. 2. (December 2014), pp. 46–57. In *Journal on Technology & Persons with Disabilities (JTPD)*. Access: https://scholarworks.calstate.edu/downloads/xs55mg57v#page=53. **[CC: 3]**.

J.1 Ren, P., Barreto, A., Huang, J., Gao, Y., **Ortega, F. R.**, and Adjouadi, M. (2014). Off-line and On-line Stress Detection through Processing of the Pupil Diameter Signal. In *Annals of Biomedical Engineering*. Springer Link vol. 42, iss. 1. (January 2014), pp. 162–176. DOI: https://doi.org/10.1007/s10439-013-0880-9. **[IF: 4.167, CC: 94]**.

Refereed Chapters in Books

β.1 Daunhauer, L., **Ortega, F. R.**, Beveridge, R., Strout, J.[†], and Bundy, A. (2021). *Chapter Five – Captivating: Avatars as therapeutic agents for children with intellectual and developmental disabilities*. Editors: Riggs, N, Rigles, B, in *International Review of Research in Developmental Disabilities*. Academic Press, Vol. 61, pp. 133–157, ISSN 2211-7095, ISBN 9780128245859. DOI: https://doi.org/10.1016/bs.irrdd.2021.08.006.

Unrefereed Chapters in Books

β.2 Hernandez, F. E., and **Ortega, F. R.** (2021). *Reducing Video Game Creation Effort with Eberos GML2D*. Chapter in *Game Development Tools* edited by Marwan Y. Ansari. AK Peters/CRC Press. New York, NY. **[CC: 2]**.

Refereed Proceedings/Transactions (Conferences)

T.48 Huffman, S., South, L., Buckman, M. J.[†], Kushalnagar, R., **Ortega, F. R.**, and Glasser, A. (2026). Reclaiming VR Design Authority: Deaf Signers Shaping Immersive Classrooms. In *Proceedings of the 2026 CHI Conference on Human Factors in Computing Systems (CHI '26)*. Association for Computing Machinery, New York, NY, USA, pp. 1–18. DOI: https://doi.org/10.1145/3772318.3790499.

T.47 Plabst, L.[†], Plabst, L.[†], Niebling, F., and **Ortega, F. R**. (2025). Five-day research-in-the-wild observation of notifications on smartglasses: A double edged sword. In *Proceedings of the 2025 31st ACM Symposium on Virtual Reality Software and Technology (VRST '25)*. Association for Computing Machinery, New York, NY, USA, Article 37, 1–10. https://doi.org/10.1145/3756884.3765976. **[AR: 26%]**.

T.46 Kelley, B.[†], McMahan, R. P., Wickens, C. D., Clegg, B. C., and **Ortega, F. R**. (2025). The Importance of Cueing While Visually Searching a 360 Degree Environment for Multiple Targets in the Presence of Distractors. In *Proceedings of the 2025 31st ACM Symposium on Virtual Reality Software and Technology (VRST '25)*. Association for Computing Machinery, New York, NY, USA, Article 28, 1–11. DOI: https://doi.org/10.1145/3756884.3765992. **[AR: 26%]**.

T.45 Turkmen, R., **Ortega, F. R.**, and Batmaz, A. U. (2025). Don't Miss Notifications: Exploring Gaze Notifications for Virtual Reality Cooking Environment. In *2025 IEEE International Symposium on Mixed and Augmented Reality (ISMAR)*. Daejeon, Korea, Republic of, 2025, pp. 518-528, https://doi.org/10.1109/ISMAR67309.2025.00062. **[AR: 21%]**.

T.44 Rehberg, R.[†], Williams, A. S., Batmaz, A. U., and **Ortega, F. R**. (2025). Repurposing Audio Playback Tools to Test Human Localization with 6DoF Sound. In *Proceedings of the 38th Annual ACM Symposium on User Interface Software and Technology (UIST '25)*. Association for Computing Machinery, New York, NY, USA, Article 21, 1–14. https://doi.org/10.1145/3746059.3747682.

T.43 Warden, A. C.[†], Wickens, C. D., Rehberg, D.[†]Clegg B. A., and **Ortega F. R**. (2025). Clutter costs in head-mounted displays: a study examining trade-offs between overlay and adjacent presentation of information. Cogn. Research 10, 47. https://doi.org/10.1186/s41235-025-00650-5. **[CC: 2]**.

T.42 Spencer, C. A.[‡], Nicoly, J. B.[†], Plabst, L.[†], Pharmer, R. L.[†], Wickens, C. D., **Ortega, F. R.**, Clegg, B. A., Lewis, J. E., & Hirshfield, L. (2025). Investigating Cognitive Engagement from Training to Application Under Varied Workload Manipulations in Virtual Reality. Proceedings of the Human Factors and Ergonomics Society Annual Meeting, 0(0). https://doi.org/10.1177/10711813251363210. **[CC: 1]**.

T.41 Borhani, Z.[†], Delamarre, A., Plabst, Lena[†], Ferguson, L., Jenkins, R., Barreto, A., & **Ortega, F. R.** (2025). Comparing Instruction Methods for DailyBuddy: A Mobile App for Improving Daily Living Skills for Adults with Autism. In: Wei, J., Margetis, G. (eds) Human-Centered Design, Operation and Evaluation of Mobile Communications. *HCII 2025* Lecture Notes in Computer Science, vol 15823. Springer, Cham. DOI: https://doi.org/10.1007/978-3-031-93061-4_13. **[CC: 1]**.

T.40 Sturgeon, M., Anspach, E., **Ortega, F. R.**, Ray, I., Safayet Arefin, M. (2025). Impact of Relevant Augmented Reality Information on Human Performance. In: Bebis, G., et al. In *Advances in Visual Computing, ISVC*. Lecture Notes in Computer Science, vol 15047. Springer, Cham. DOI: https://doi.org/10.1007/978-3-031-77389-1_15. **[CC: 1]**.

T.39 Raikwar, A.†, Plabst, L.†, Batmaz, A. U., Niebling, F., **Ortega, F. R.** (2024). Ping! Your Food is Ready: Comparing Different Notification Techniques in 3D AR Cooking Environment. In *2024 IEEE International Symposium on Mixed and Augmented Reality (ISMAR)*, Bellevue, WA, USA, pp. 1157-1166. DOI: https://doi.org/10.1109/ISMAR62088.2024.00132. **[AR: 21%, CC: 4]**.

T.38 Kelley, B.†, Wickens, C., Warden, A. C.†, Clegg, B., and **Ortega, F.** (2024). 2D and 3D Augmented Reality Attention Cueing Comparisons in 3D Target Search. In *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, 68(1), 1176-1180. DOI: https://doi.org/10.1177/10711813241265077. **[CC: 3]**.

T.37 Nicoly, J. B.†, Masters, R.†, Gaddy, V.†, Interrante, V., and **Ortega, F. R.** (2024). The Restorative Influence of Virtual Reality Environment Design. In *ACM Symposium on Applied Perception 2024 (SAP '24)*. Association for Computing Machinery, New York, NY, USA, Article 12, 1–10. DOI: https://doi.org/10.1145/3675231.3675244. **[CC: 4]**.

T.36 Mifsud, D. M.†, Wickens, C. D., Rodriguez, R.†, **Ortega, F. R.**, Maulbeck, M. (2024). Augmented Reality Compensatory Aid for Improved Weapon Splash-Zone Awareness. In *International Conference on Human-Computer Interaction* (pp. 230-240). Cham: Springer Nature Switzerland. DOI: https://doi.org/10.1007/978-3-031-61044-8_17. **[AR: 25%]**.

T.35 Li, J.†, Coler, A. S., Borhani, Z.†, **Ortega, F. R.** (2024). Collecting and Analyzing the Mid-Air Gestures Data in Augmented Reality and User Preferences in Closed Elicitation Study. In *International Conference on Human-Computer Interaction*, pp. 201-215. Cham: Springer Nature Switzerland. DOI: https://doi.org/10.1007/978-3-031-61044-8_15. **[AR: 25%, CC: 1]**.

T.34 Rodriguez, R., Sullivan, B. T., Barrera Machuca, M. D., Batmaz, A. U., Tornatzky, C., and **Ortega, F. R.** (2024). An Artists' Perspectives on Natural Interactions for Virtual Reality 3D Sketching. In *Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems (CHI '24)*. Association for Computing Machinery, New York, NY, USA, Article 163, 1–20. DOI: https://doi.org/10.1145/3613904.3642758. **[AR: 26.4%, CC: 14]**.

T.33 Aliza, A., Zaugg, I.†, Çelik, E., Stuerzlinger, W., **Ortega, F. R.**, Batmaz, A. U., and Sarac, M. (2024). Eye-Hand Coordination Training: A Systematic Comparison of 2D, VR, and AR Display Technologies and Task Instructions. In *2024 IEEE Conference Virtual Reality and 3D User Interfaces (VR)*, Orlando, FL, USA, pp. 200–210. DOI: https://doi.org/10.1109/VR58804.2024.00043. **[AR: 28%, CC: 8]**.

T.32 Warden, A. C.†, Wickens, C. D., Clegg, B. A., and **Ortega, F. R.** (2023). A Meta-Analytic Examination of the Cost and Benefits of Overlay versus Separate Displays. In *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, 67(1), pp. 1501–1502. DOI: https://doi.org/10.1177/21695067231192430.

T.31 Williams A.†, Batmaz A. U., Zhou X.†, Pahud M., and **Ortega F. R**. (2023). A Pilot Study Comparing User Interactions Between Augmented and Virtual Reality. In Bebis, G., et al.

Advances in Visual Computing: 17th International Symposium. ISVC 2023. Lecture Notes in Computer Science, vol 14362, pp. 3–14. Springer, Cham. DOI: https://doi.org/10.1007/978-3-031-47966-3_1. **[AR: 35%, CC: 3]**.

T.30 Kelley B.†, Batmaz A. U., Humphrey M., Tornatzky C., Martey R., **Ortega F. R**. (2023). Emergent Individual Factors for AR Education and Training. In Bebis, G., et al. *Advances in Visual Computing: 17th International Symposium.* ISVC 2023. Lecture Notes in Computer Science, vol 14362, pp. 27–38. Springer, Cham. DOI: https://doi.org/10.1007/978-3-031-47966-3_3. **[CC: 3]**.

T.29 🏆 Warden, A. C., Wickens C. D., Clegg B. A., and **Ortega F. R**. (2023). Effects of Color Commonality of Overlay Clutter and Information Access Effort on Tasks Requiring Visual Search. In *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, 0(0). DOI: https://doi.org/10.1177/21695067231192615. ★ **HFES Best Student Paper Award (to all authors)**. Sage CA: Los Angeles, CA: SAGE Publications.

T.28 🏆 Poole C. A., Warden A. C., Wickens C. D., Raikwar A.†, Clegg B. A., and **Ortega F. R**. (2023). Information Access Costs with a Wide-Angle Desktop Display. In *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, 0(0). DOI: https://doi.org/10.1177/21695067231192646. ★ **HFES Best Student Paper Award (to all authors)**. Sage CA: Los Angeles, CA: SAGE Publications. **[CC: 6]**.

T.27 Plabst, L.†, Raikwar, A.†, Oberdörfer, S., **Ortega, F. R.**, and Niebling, F. (2023). Exploring Unimodal Notification Interaction and Display Methods in Augmented Reality. In *Proceedings of the 29th ACM Symposium on Virtual Reality Software and Technology (VRST'23).* pp. 1-11. DOI: https://doi.org/10.1145/3611659.3615683. **[AR: 26%, CC: 3]**.

T.26 Plabst, L.†, Oberdörfer, S., **Ortega, F. R**., and Niebling, F. (2022). Push the Red Button: Comparing Notification Placement with Augmented and Non-Augmented Tasks in AR. In *Proceedings of the 2022 ACM Symposium on Spatial User Interaction (SUI '22).* Association for Computing Machinery. pp. 1–11. DOI: https://doi.org/10.1145/3565970.3567701. **[CC: 26]**.

T.25 Zhou, X. †, Williams, A. S., and **Ortega, F. R**. (2022). Eliciting Multimodal Gesture+Speech Interactions in a Multi-Object Augmented Reality Environment. In *Proceedings of the 28th ACM Symposium on Virtual Reality Software and Technology (VRST '22).* Association for Computing Machinery. pp. 1–10. DOI: https://doi.org/10.1145/3562939.3565637. **[AR: 26%, CC: 23]**.

T.24 Masters, R.†, Interrante, V., Watts, M.†, and **Ortega, F. R**. (2022). Virtual Nature: Investigating the Effect of Biomass on Immersive Virtual Reality Forest Bathing Applications For Stress Reduction. In *ACM Symposium on Applied Perception 2022 (SAP '22).* Association for Computing Machinery. pp. 1–10. DOI: https://doi.org/10.1145/3548814.3551459. **[CC: 24]**.

T.23 🏆 Warden, A. C.†, Wickens, C. D., Rehberg, D.†, Clegg, B. A., and **Ortega, F. R.** (2022). Information Access Effort: Are Head Movements "Cheap" or Even "Free"?. In *Proceedings of the Human Factors and Ergonomics Society 66th Annual Meeting.* SAGE. pp. 2203–2207. DOI: https://doi.org/10.1177/1071181322661127. ★ **HFES Best Student Paper Award (to all authors)**. **[CC: 7]**.

T.22 Warden, A. C.[†], Wickens, C. D., Mifsud, D.[†], Ourada, S.[†], Clegg, B. A., and **Ortega, F. R.** (2022). Visual Search in Augmented Reality: Effect of Target Cue Type and Location. In *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*. SAGE. pp. 373–377. DOI: https://doi.org/10.1177/1071181322661260. **[CC: 25]**.

T.21 Mifsud, D.[†], Wickens, C., Maulbeck, M., Crane, P., and **Ortega, F. R.** (2022). The Effectiveness of Gaze Guidance Lines in supporting JTAC's attention allocation. In *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*. SAGE. pp. 2198–2201. DOI: https://journals.sagepub.com/doi/pdf/10.1177/1071181322661143. **[CC: 13]**.

T.20 Zhou, X.[†], Williams, A. S.[†], **Ortega, F. R.** (2022). Towards Establishing Consistent Proposal Binning Methods for Unimodal and Multimodal Interaction Elicitation Studies. In *Human-Computer Interaction. Theoretical Approaches and Design Methods*. Springer, Cham. pp. 356–368. DOI: https://doi.org/10.1007/978-3-031-05311-5_25. **[CC: 5]**.

T.19 Al Azad, M. W., Shannigrahi, S., Stergiou, N., **Ortega, F. R.**, and Mastorakis, S. (2021). CLEDGE: A Hybrid Cloud-Edge Computing Framework over Information Centric Networking. In *2021 IEEE 46th Conference on Local Computer Networks*. IEEE. pp. 589–596. DOI: https://doi.org/10.1109/LCN52139.2021.9525006. **[AR: 28%, CC: 22]**.

T.18 Rodriguez, R.[†], Mifsud, D.[†], Wickens, C., Williams, A. S.[†], Tarre, K.[‡], Crane, P., and **Ortega, F. R**. (2021). Virtual Reality Compensatory Aid for Improved Weapon Splash-Zone Awareness. In *Human-Computer Interaction. Virtual, Augmented and Mixed Reality*. Springer, Cham. pp. 533–544. DOI: https://doi.org/10.1007/978-3-030-77599-5_36. **[AR: 30%, CC: 1]**.

T.17 Williams, A. S. [†], Angelini, C.[‡], Kress, M.[‡], Ramos Vieira, E., D'Souza, N., Rishe, N. D., Medina, J.[‡], Özer, E., and **Ortega, F. R.** (2020). Augmented Reality for City Planning. In *Human-Computer Interaction International*. Springer, Cham. pp. 256–271. DOI: https://doi.org/10.1007/978-3-030-49695-1_17. **[AR: 26.5%, CC: 14]**.

T.16 McNeely-White, D. G.[†], **Ortega, F. R.**, Beveridge, J. R., Draper, B. A., Bangar, R.[†], Patil, D.[†], Pustejovsky, J., Krishnaswamy, N., Rim, K., Ruiz, J., and Wang, I. (2019). User-Aware Shared Perception for Embodied Agents. In *2019 IEEE International Conference on Humanized Computing and Communication (HCC)*. IEEE. pp. 46–51. DOI: https://doi.org/10.1109/HCC46620.2019.00015. **[CC: 10]**.

T.15 O-larnnithipong, N., Ratchatanantakit, N., Tangnimitchok, S., **Ortega, F. R.**, Barreto, A., and Adjouadi, M. (2019). Statistical Analysis of Novel and Traditional Orientation Estimates from an IMU-Instrumented Glove. In *Antona M., Stephanidis C. (eds) Universal Access in Human-Computer Interaction. Multimodality and Assistive Environments*. Springer, Cham. pp. 282–299. DOI: https://doi.org/10.1007/978-3-030-23563-5_23.

T.14 Ozer, E., D'Souza, N., Vieira, E., **Ortega, F. R.** (2019). An Underline for the Underserved: A Pilot Study to Explore Simulation Research for Sustainable Aging Around Miami's Metrorail. In *Sustainable Urban Environments: Research, Design and Planning for the Next 50 Years*. EDRA. DOI: https://edra.confex.com/edra/EDRA50/meetingapp.cgi/Paper/6959.

T.13 Tangnimitchok, S., O-larnnithipong, N., Ratchatanantakit, N., Barreto, A., **Ortega, F. R.**, and Rishe, N. D. (2018). A System for Non-Intrusive Affective Assessment in the

Circumplex Model from Pupil Diameter and Facial Expression Monitoring. In *Human-Computer Interaction. Theories, Methods, and Human Issues*. Springer, Cham. pp. 465–477. DOI: https://doi.org/10.1007/978-3-319-91238-7_38. **[AR: 27%, CC: 3]**.

T.12 Balcazar, R.‡, **Ortega, F. R.**, Tarre, K.‡, Barreto, A., Weiss, M., and Rishe, N. D. (2017). CircGR: Interactive Multi-Touch Gesture Recognition using Circular Measurements. In *Proceedings of the 2017 ACM International Conference on Interactive Surfaces and Spaces*. Association for Computer Machinery. pp. 12–21. **[AR: 26.90%, CC: 10]**.

T.11 **Ortega, F.**, Galvan, A.‡, Tarre, K.‡, Barreto, A., Rishe, N., Bernal, J.‡, Balcazar, R.‡, and Thomas, J. L‡. (2017). Gesture Elicitation for 3D Travel via Multi-Touch and Mid-Air Systems for Procedurally Generated Pseudo-Universe. In *2017 IEEE Symposium on 3D User Interfaces*. IEEE. pp. 144–153. DOI: https://doi.org/10.1109/3DUI.2017.7893331. **[AR: 32%, CC: 37]**.

T.10 Tangnimitchok, S., O-Larnnithipong, N., Barreto, A., **Ortega, F. R.**, and Rishe, N. D. (2016). Finding an Efficient Threshold for Fixation Detection in Eye Gaze Tracking. In *International Conference on Human-Computer Interaction, Interaction Platforms and Techniques* of the series Lecture Notes in Computer Science. Springer, Cham. pp. 93–103. DOI: https://doi.org/10.1007/978-3-319-39516-6_9. **[AR: 29%, CC: 2]**.

T.9 Abyarjoo, F., O-Larnnithipong, N., Tangnimitchok, S., **Ortega, F. R.**, and Barreto, A. (2015). PostureMonitor: Real-Time IMU Wearable Technology to Foster Poise and Health. In *International Conference of Design, User Experience, and Usability* of the series Lecture Notes in Computer Science. Springer, Cham. pp. 543–552. DOI: https://doi.org/10.1007/978-3-319-20889-3_50. **[AR: 30%, CC: 23]**.

T.8 **Ortega, F. R.**, Barreto, A., Rishe, N., O-Larnnithipong, N., Adjouadi, M., and Abyarjoo, F. (2015). GyroTouch: Wrist Gyroscope with a Multi-Touch Display. In *International Conference on Human-Computer Interaction*, Human-Computer Interaction: Interaction Technologies of the series Lecture Notes in Computer Science. Springer, Cham. pp. 262–270. DOI: https://doi.org/10.1007/978-3-319-20916-6_25. **[AR: 30%, CC: 1]**.

T.7 **Ortega, F. R.**, Rishe, N., Barreto, A., Abyarjoo, F., and Adjouadi, M. (2015). Multi-Touch Gesture Recognition Using Feature Extraction. In *Innovations and Advances in Computing, Informatics, Systems Sciences, Networking and Engineering* of the series Lecture Notes in Electrical Engineering. Springer, Cham. pp. 291–296. DOI: https://doi.org/10.1007/978-3-319-06773-5_39. **[CC: 4]**.

T.6 Abyarjoo, F., Barreto, A., Cofino, J., and **Ortega, F. R.** (2015). Implementing a Sensor Fusion Algorithm for 3D Orientation Detection with Inertial/Magnetic Sensors. In *Innovations and Advances in Computing, Informatics, Systems Sciences, Networking and Engineering* of the series Lecture Notes in Electrical Engineering. Springer, Cham. pp. 305–310. DOI: https://doi.org/10.1007/978-3-319-06773-5_41. **[CC: 128]**.

T.5 **Ortega, F. R.**, Liu, S., Hernandez, F.‡, Barreto, A., Rishe, N., and Adjouadi, M. (2014). PeNTa: Multi-Touch Modeling using Petri Nets. In *International Conference on Human-Computer Interaction*, Human-Computer Interaction: Theories, Methods, and Tools of the series Lecture Notes in Computer Science. Springer, Cham. pp. 361-372. DOI: https://doi.org/10.1007/978-3-319-07233-3_34. **[AR: 31%, CC: 1]**.

T.4 Abyarjoo, F., Barreto, A., Abyarjoo, S., **Ortega, F. R.**, and Cofino, J. (2013). Monitoring Human Wrist Rotation in Three Degrees of Freedom. In *2013 Proceedings of IEEE SoutheastCon*. IEEE. pp. 1-5. DOI: https://doi.org/10.1109/SECON.2013.6567517. **[CC: 11]**.

T.3 Cofino, J., Barreto, A., Abyarjoo, F., **Ortega, F. R.** (2013). Sonifying HTML tables for audio-spatially enhanced non-visual navigation. In *2013 Proceedings of IEEE Southeastcon*. IEEE. pp. 1–5. DOI: https://doi.org/10.1109/SECON.2013.6567417. **[CC: 2]**.

T.2 **Ortega, F.**, Barreto, A., Rishe, N., and Adjouadi, M. (2013). Interaction with 3D Environments Using Multi-Touch Screens. (2013). In *Innovations and Advances in Computer, Information, Systems Sciences, and Engineering* of the series Lecture Notes in Electrical Engineering. vol. 152, pp. 381–392, CISSE. Springer. DOI: https://doi.org/10.1007/978-1-4614-3535-8_33 **[AR: 41%, CC: 1]**.

T.1 Verhoef, T., Lisetti, C., Barreto, A., **Ortega, F. R.**, Van der Zant, T., and Cnossen, F. (2009). Bio-sensing for Emotional Characterization without Word Labels. In *Human-Computer Interaction. Ambient, Ubiquitous and Intelligent Interaction, 13th International Conference, HCI International*. Lecture Notes in Computer Science. Springer, Cham. pp. 693–702. DOI: https://doi.org/10.1007/978-3-642-02580-8_76. **[AR: 32%, CC: 28]**.

Refereed Workshop Articles

W.24 **Ortega, F. R.**, Interrante, V., Lotemplio, S., Masters, R.†, Nicoly, J.†, Borhani, Z.†, Davalos, D., and Zielasko, D. (2024). Enhancing Well-Being Through Positive Technology: VR Forest Bathing. In *2024 Conference on Computer-Supported Cooperative Work and Social Computing, Envisioning New Futures of Positive Social Technology: Beyond Paradigms of Fixing, Protecting, and Preventing (Positech)*. Access: https://arxiv.org/abs/2411.06293. **[CC: 2]**.

W.23 Asif, A.†, U. Z., Sridhar, M., Ray, I., and **Ortega, F. R.** (2024). Breaking the Virtual Barrier of Exploit Chain Attacks in XR Systems. *2024 IEEE International Symposium on Mixed and Augmented Reality Adjunct (ISMAR-Adjunct), SafeAR: Approaching Augmented Reality Design & Development with a Security, Privacy & Safety Mindset*, Bellevue, WA, USA, pp. 32-34. DOI: https://doi.org/10.1109/ISMAR-Adjunct64951.2024.00017. **[CC: 1]**.

W.22 Kelley, B.†, Raikwar, A.†, Wickens, C. D. , McMahan, R. P., **Ortega, F. R.**, and Clegg, B. A. (2024). Addressing Human Factors Related to Artificial Intelligence Integrated Visual Cueing. In *2024 IEEE International Symposium on Mixed and Augmented Reality Adjunct (ISMAR-Adjunct), 1st Workshop on Intelligent XR: Harnessing AI for Next-Generation XR User Experiences (iXR)*, Bellevue, WA, USA, pp. 209-213. DOI: https://doi.org/10.1109/ISMAR-Adjunct64951.2024.00051. **[CC: 2]**.

W.21 Borhani Z.†, and **Ortega, F. R.** (2024). Enhancing Replicability in XR HCI Studies: A Survey-Based Approach. In *2024 IEEE International Symposium on Mixed and Augmented Reality Adjunct (ISMAR-Adjunct), 4th Workshop on Replication in Extended Reality (WoRXR)*, Bellevue, WA, USA, pp. 42-46, DOI: https://doi.org/10.1109/ISMAR-Adjunct64951.2024.00020. **[CC: 1]**.

W.20 Borhani, Z.[†], Borhani, F., and **Ortega, F. R.** (2024). Experiencing Gravitational Red-Shifting in Virtual Reality. In *2024 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW), 5th Annual Workshop on 3D Content Creation for Simulated Training in eXtended Reality (TrainingXR)*, Orlando, FL, USA, 2024, pp. 133-137, DOI: https://doi.org/10.1109/VRW62533.2024.00028.

W.19 Zhou[†], X., Yang, Y., **Ortega, F. R.**, Batmaz, A. U., Lee, B. (2023). Data-driven Storytelling in Hybrid Immersive Display Environments. *In 2023 IEEE International Symposium on Mixed and Augmented Reality Adjunct (ISMAR-Adjunct)*, Sydney, Australia, pp. 242–246. DOI: https://doi.org/10.1109/ISMAR-Adjunct60411.2023.00056. **[CC: 14]**.

W.18 Karduna, A.[†], Williams, A. S.[†], and **Ortega, F. R.** (2022). NUI-SpatialMarkers: AR Spatial Markers For the Rest of Us. In *2022 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops. IEEE VR 2022 Workshop - Open Access Tools and Libraries for Virtual Reality.(VRW '22)*, March 12-16, Christchurch, New Zealand. IEEE, pp. 58-60. DOI: https://doi.org/10.1109/VRW55335.2022.00022.

W.17 Gaddy, V.[†], and **Ortega, F. R.** (2022). Exploring Factors Associated with Retention in Computer Science Using Virtual Reality. In *2022 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW '2022)*, March 12–16 2022, Christchurch, New Zealand, pp. 271–276. Seventh workshop on K-12+ Embodied Learning through Virtual and Augmented Reality (KELVAR). DOI: https://doi.org/10.1109/VRW55335.2022.00062. **[CC: 3]**.

W.16 Batmaz, A. U., Mifsud, D.[†], Steed, A., Stuerzlinger, W., and **Ortega, F. R**. (2021). Researchers' and Participants' Experiences on Distributed User Studies Conducted in the First Year of COVID-19 Pandemic. In *First XR Remote Research Workshop (ACM CHI '21)*, March 27 - April 1, 2021, Lisbon, Portugal. IEEE, pp. 1–3. DOI: https://doi.org/10.1109/VRW52623.2021.00045.

W.15 Williams, A. S. [†], and **Ortega, F. R.** (2021). Using a 6 Degrees of Freedom Virtual Reality Input Device With An Augmented Reality Headset In A Collaborative Environment. In *2021 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW)*. Third Workshop on Novel Input Devices and Interaction Techniques (NIDIT). March 27 - April 1, 2021, Lisbon, Portugal. IEEE, pp. 205–209. DOI: https://doi.org/10.1109/VRW52623.2021.00045. **[CC: 5]**.

W.14 Ratcliffe, J., Soave, F., Hoover, M., **Ortega, F. R.**, Bryan-Kinns, N., Tokarchuk, L., and Farkhatdinov, I. (2021). Remote XR Studies: Exploring Three Key Challenges of Remote XR Experimentation. In *Extended Abstracts of the 2021 CHI Conference on Human Factors in Computing Systems (CHI EA '21)*. May 2021, Association for Computing, pp. 1–4. DOI: https://doi.org/10.1145/3411763.3442472. **[CC: 18]**.

W.13 Pustejovsky, J., Krishnaswamy, N., Beveridge, R., **Ortega, F. R.**, Patil, D.[†], Want, H.[†], and White, D[†]. (2020). Interpreting and Generating Gestures with Embodied Human Computer Interactions. In *ACM IVA '20, Generation and Evaluation of Non-verbal Behaviour for Embodied Agents Workshop*. In print. DOI: https://doi.org/10.1007/978-1-4614-3535-8_33. 2020. **[CC: 4]**.

W.12 Williams, A. S.[†], Coler, S., **Ortega, F. R.** (2020). Conversations On Multimodal Input Design With Older Adults. In *ACM CHI 2020 Workshop Designing Interactions for the*

Ageing Populations – Addressing Global Challenges. pp. 1–4. DOI: https://arxiv.org/pdf/2008.11834.pdf. **[CC: 1]**.

W.11 Shannigrahi, S., Mastorakis, S., and **Ortega, F. R**. (2020). Next-Generation Networking and Edge Computing for Mixed Reality Real-Time Interactive Systems. In *2020 IEEE International Conference on Communications Workshops (ICC Workshops)*, June 7-11, 2020, Dublin, Ireland. IEEE, pp. 1–6. DOI: https://doi.org/10.1109/ICCWorkshops49005.2020.9145075. **[CC: 45]**.

W.10 Gaddy, V.†, and **Ortega, F. R**. (2020). Exploring the Impact of Belonging on Computer Science Enrollment Using Virtual Reality. In *2020 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW)*. March 22-26, 2020, Atlanta, GA, USA. IEEE, pp. 444-448. Fifth workshop on K-12+ Embodied Learning through Virtual and Augmented Reality (KELVAR). DOI: https://doi.org/10.1109/VRW50115.2020.00094. **[CC: 1]**.

W.9 Williams, A. S. †, and **Ortega, F. R**. (2020). Insights on visual aid and study design for gesture interaction in limited sensor range Augmented Reality devices. In *2020 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW). Second Workshop on Novel Input Devices and Interaction Techniques (NIDIT)*. March 22-26, 2020, Atlanta, GA, USA. IEEE, pp. 19–22. DOI:https://doi.org/10.1109/VRW50115.2020.00286. **[CC: 5]**.

W.8 O-larnnithipong, N., Ratchatanantakit, N., Tangnimitchok, S., **Ortega, F. R.**, and Barreto, A. (2019). Hand Tracking Interface for Virtual Reality Interaction based on MARG sensors. In *2019 IEEE Conference on Virtual Reality and 3D User Interfaces (VR), Workshop on Novel Input Devices and Interaction Techniques (NIDIT)*. March 23-27, 2019, Osaka, Japan. IEEE, pp. 1717–1722. DOI: https://doi.org/10.1109/VR.2019.8797982. **[CC: 7]**.

W.7 **Ortega, F. R.**, Tarre, K.‡, Kress, M.‡, Williams, A. S.†, Barreto, A. B., and Rishe, N. D. (2019). Selection and Manipulation Whole-Body Gesture Elicitation Study In Virtual Reality. In *2019 IEEE Conference on Virtual Reality and 3D User Interfaces (VR), Workshop on Novel Input Devices and Interaction Techniques (NIDIT)*, March 23-27, 2019, Osaka, Japan. IEEE, pp. 1723–1728. DOI: https://doi.org/10.1109/VR.2019.8798105. **[CC: 24]**.

W.6 Raikwar, A.†, D'Souza, N., Rogers, C.‡, Kress, M.‡, Williams, A.†, Rishe, N. D., **Ortega, F. R**. (2019). CubeVR: Digital Affordances for Architecture Undergraduate Education using Virtual Reality In *2019 IEEE Conference on Virtual Reality and 3D User Interfaces, Workshop on K-12 Embodied Learning through Virtual & Augmented Reality (KELVAR)*. March 23-27, 2019, Osaka, Japan. IEEE, pp. 1623–1626. DOI: https://doi.org/10.1109/VR.2019.8798115. **[CC: 14]**.

W.5 **Ortega, F. R.**, Bolivar, S.‡, Bernal, J.‡, Galvan, A.‡, Tarre, K.‡, Rishe, N., and Barreto, A. (2017). Towards a 3D Virtual Programming Language to Increase the Number of Women in Computer Science Education. In *2017 IEEE Virtual Reality Workshop on K-12 Embodied Learning through Virtual & Augmented Reality* (KELVAR), March 19, 2017, Los Angeles, CA. pp. 1–6.DOI: https://doi.org/10.1109/KELVAR.2017.7961558. **[CC: 24]**.

W.4 **Ortega, F. R.**, Jamides, S.‡, Barreto, A., and Rishe, N. D. (2017). The Tabletop is Dead. Long Live the Tabletop!. In *The Disappearing Tabletop: Social and Technical Challenges*

for Cross-Surface Collaboration workshop on Interactive Surfaces and Spaces (ISS '17). DOI: https://thedisappearingworkshop.wordpress.com/at-the-workshop.

W.3 **Ortega, F. R.**, Balcazar, R.[‡], Barreto, A., and Rishe, N. D. (2016). Smart Learning Desk: Towards an Interactive Classroom. In *IEEE Virtual Reality 2016 Workshop on K-12 Embodied Learning through Virtual & Augmented Reality (KELVAR '16)*, March 2016. DOI: https://sites.google.com/site/vrkelvar/vr2016.

W.2 Wu Y., Hernandez, F.[‡], **Ortega, F. R.**, Clarke, P. J., and France, R. (2010). Measuring the Effort for Creating and Using Domain-Specific Models. In *Proceedings of the 10th Workshop on Domain-Specific Modeling* (DSM '10). ACM, New York, NY, USA, article 14, pages 6. DOI: https://doi.org/10.1145/2060329.2060360. **[AR: 66%, CC: 37]**.

W.1 Hernandez, F. E., and **Ortega, F. R.** (2010). Eberos GML2D: A Graphical Domain-Specific Language for Modeling 2D Video Games. In *Proceedings of the 10th Workshop on Domain-Specific Modeling* (DSM '10). ACM, New York, NY, USA, article 4, pages 6. **[AR: 66%, CC: 32]**.

Refereed Poster Articles and Late Breaking Works

P.22 Heinrich, F., Mielke, T., Klank, R., **Ortega, F. R.**, Hansen, C., Huber, T., and Huettl, F. (2026). HoloNote: Exploring Augmented Reality Notifications for Ergonomic Feedback in Laparoscopic Training. In *Extended Abstracts of the 2026 CHI Conference on Human Factors in Computing Systems (CHI EA '26)*. Association for Computing Machinery, New York, NY, USA, pp. 1–6. DOI: https://doi.org/10.1145/3772363.3799086.

P.21 Aich, S., Plabst, Lena[†], South, L., Huffman, S., and **Ortega, F. R**. (2025). Surveying Accessibility Features in VR Applications for Meta Quest 3. In *Proceedings of the 2025 31st ACM Symposium on Virtual Reality Software and Technology (VRST '25)*. Association for Computing Machinery, New York, NY, USA, Article 112, 1–3. https://doi.org/10.1145/3756884.3768412.

P.20 Kelley [†], B., McMahan, R. P., Wickens, C. D., Clegg B. A., and **Ortega F. R**. Cuing Multiple-Targets for Visual Search in Virtual Reality. 2025. *IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW)*, Saint Malo, France, 2025, pp. 1222-1223, doi: 10.1109/VRW66409.2025.00257.

P.19 Zhou, X.[†], Batmaz, A. U., Williams, A. S., Schreiber, D.[†], and **Ortega, F. R.** (2024). I Did Not Notice: A Comparison of Immersive Analytics with Augmented and Virtual Reality. In *Extended Abstracts of the CHI Conference on Human Factors in Computing Systems (CHI EA '24)* Late-Breaking Work. Association for Computing Machinery, New York, NY, USA, Article 193, 1–7. DOI: https://doi.org/10.1145/3613905.3651085. **[CC: 3]**.

P.18 LoTemplio, S., Johnson, S., Rice, M., and Masters, R.[†], Collins, S-A., Hoefecker, J., Rivera, J., Schreiber, D.[†], Interrante, V. and **Ortega, F. R.**, and Davalos, D. (2024). Aging Naturally: Virtual reality nature vs real-world nature's effects on executive functioning and stress recovery in older adults. In *2024 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW)*, Orlando, FL, USA, pp. 1061-1062, https://doi: 10.1109/VRW62533.2024.00327. **[CC: 2]**.

P.17 Kelley, B.†, Wickens, C., Clegg, B., Warden, A. C., and **Ortega, F. R.** (2024). Guiding Gaze: Comparing Cues for Visual Search. In *2024 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW)*, Orlando, FL, USA, pp. 1053-1054, DOI: doi: https://10.1109/VRW62533.2024.00323. 2024. **[CC: 5]**.

P.16 Borhani, Z.†, and **Ortega F. R.** (2023). A Virtual Reality System for Gender Swapping to Increase Empathy against Stereotype Threats in Computer Science Job Interviews. In *2023 IEEE International Symposium on Mixed and Augmented Reality Adjunct (ISMAR-Adjunct)*, Sydney, Australia, pp. 648–649. DOI: https://10.1109/ISMAR-Adjunct60411.2023.00138. **[CC: 3]**.

P.15 Raikwar, A.†, Mifsud, D.†, Wickens, C., Kelley, B.†, Warden, A.†, Clegg, C., **Ortega. F. R.** (2023). Beyond the Wizard of Oz: Using Imperfect Machine Learning to Examine the Impact of Reliability of Augmented Reality Cues on Visual Search Performance. In *2023 IEEE International Symposium on Mixed and Augmented Reality Adjunct (ISMAR-Adjunct)*, Sydney, Australia, pp. 437–438. DOI: https://doi.org/10.1109/ISMAR-Adjunct60411.2023.00093. **[CC: 12]**.

P.14 Plabst, L.†, Obertdörfer, S. **Ortega, F. R.**, and Niebling, F. (2022). Press the red button: A user study comparing notification placement with augmented and non-augmented tasks in AR. In *The 21st IEEE International Symposium on Mixed and Augmented Reality* (ISMAR). October 17 - 21, 2022, Singapore, Singapore. IEEE, pp. 483–484. DOI: https://doi.org/10.1109/ISMAR-Adjunct57072.2022.00101. **[CC: 1]**.

P.13 Mifsud, D. M.†, Williams, A. S.†, **Ortega, F. R.**, and Teather, R. J. (2022). Augmented Reality Fitts' Law Input Comparison Between Touchpad, Pointing Gesture, and Raycast. In *2022 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops* (VRW). March 12 - 16, 2022, Christchurch, New Zealand. IEEE, pp. 590–591. DOI: https://doi.org/10.1109/VRW55335.2022.00146. **[CC: 18]**.

P.12 Vieria, E. R., Estrázulas, J. A., Civitella, F., Carreno, J., D'Souza, N., Ozer, E., and **Ortega, F. R**. (2019). Does wearing augmented-reality goggles affect older adults' kinematics during gait? The Gerontological Society of America's 71st Annual Scientific Meeting. Austin, Texas. November 13-17, 2019. Innovation in Aging, 3(S1), S338, DOI: https://doi.org/10.1093/geroni/igz038.1226.

P.11 Johnston, D.†, Flack, J.†, Ray, I., and **Ortega, F. R**. (2019). Towards a Virtual Reality Home IoT Network Visualization. In *2019 Graphics Interface - Human-Computer Interaction Track*, May 2019, pp. 1–2. DOI: https://doi.org/10.48550/arXiv.2001.06579. **[CC: 3]**.

P.10 Angelini, C.‡, Williams, A. S.†, Kress, M.‡, Vieira, E. R., D'Souza, N., Rishe, N. D., Medina, J.‡, and **Ortega, F. R**. (2019). City Planning with Augmented Reality. In *2019 Graphics Interface - Human-Computer Interaction Track*, May 2019, pp. 1–2. DOI: https://doi.org/10.48550/arXiv.2001.06578. **[CC: 12]**.

P.9 **Ortega, F. R.**, Tarre, K.,‡, Kress, M.‡, Williams, A. S. †, Barreto, A. B., and Rishe, N. D. (2019). Selection and Manipulation Whole-Body Gesture Elicitation Study In Virtual Reality. In *2019 IEEE Conference on Virtual Reality and 3D User Interfaces (VR)*, March 23 - 27, Osaka, Japan. IEEE, pp. 1723–1728. DOI: https://doi.org/10.1109/VR.2019.8798182. **[CC: 24]**.

P.8 Tarre, K.[‡], Williams, A. S.[†], Borges, L.[‡], Rishe, N .D., Barreto, A. B., and **Ortega, F. R**. (2018). Towards first person gamer modeling and the problem with game classification in user studies. In *Proceedings of the 24th ACM Symposium on Virtual Reality Software and Technology (VRST '18)*, Stephen N. Spencer (Ed.). ACM, 2 pages. DOI: https://doi.org/10.1145/3281505.3281590. **[CC: 7]**.

P.7 Galvan, A.[‡], **Ortega, F. R.**, and Rishe, N. (2017). Procedural Celestial Rendering for 3D Navigation. In *2017 IEEE Symposium on 3D User Interfaces (3DUI)*, March 18 - 19, Los Angeles, CA. IEEE, pp. 211–212. DOI: https://doi.org/10.1109/3DUI.2017.7893346. **[CC: 2]**.

P.6 Calella, J. C.[‡], **Ortega, F. R.**, Rishe, N., Bernal, J. F.[‡], and Barreto, A. (2016). HandMagic: Towards User Interaction with Inertial Measuring Units. In *2016 IEEE SENSORS*. October 30 - November 3, Orlando, FL. IEEE, pp. 1–3. DOI: https://doi.org/10.1109/ICSENS.2016.7808524. **[AR: 58%, CC: 5]**.

P.5 Vassigh, S., Elias, A., **Ortega, F. R.**, Davis, D., Gallardo, G., Alhaffar, H., Borges, L.[‡], Bernal, J.[‡], and Rishe, N. D. (2016). Integrating Building Information Modeling with Augmented Reality for Interdisciplinary Learning. In *2016 IEEE International Symposium Mixed and Augmented Reality* (ISMAR-Adjunct). September 19 - 23, Merida, Mexico. IEEE, pp. 260–261. DOI: https://doi.org/10.1109/ISMAR-Adjunct.2016.0089. **[CC: 37]**.

P.4 **Ortega, F. R.**, Rishe, N. D., and Barreto, A. (2015). TAMGeF: Touch-midAir-Motion Framework for Spatial Input. In *Proceedings of the 3rd ACM Symposium on Spatial User Interaction (SUI '15)*. Association for Computing Machinery, pp. 136. DOI: https://doi.org/10.1145/2788940.2794355.

P.3 **Ortega, F. R.**, Hernandez, F., Barreto, A., Rishe, N. D., Adjouadi, M., and Liu, S. (2013). Exploring Modeling Language for Multi-Touch Systems Using Petri-Nets. In *Proceedings of the 2013 ACM International Conference on Interactive Tabletops and Surfaces* (ITS '13). Association for Computing Machinery, pp. 361–364. DOI: https://doi.org/10.1145/2512349.2512400. **[CC: 9]**.

P.2 **Ortega, F. R.**, Barreto, A., and Rishe, N. (2013). Augmenting Multi-Touch with Commodity Devices. (2013). In *Proceedings of the 1st Symposium on Spatial User Interaction* (SUI '13). July 20 - 21, Los Angeles, CA, USA. Association for Computing Machinery, p. 95. DOI: https://dl.acm.org/doi/pdf/10.1145/2491367.2491399. **[CC: 1]**.

P.1 **Ortega, F. R**, Barreto, A., Rishe, N., Adjouadi, M., and Abyarjoo, F. (2013). Poster: Real-Time Gesture Detection for Multi-Touch Devices. In *IEEE 8th Symposium on 3D User Interfaces* (3DUI '13). March 16-17, Orlando, FL. IEEE, pp. 167–168. DOI: https://doi.org/10.1109/3DUI.2013.6550231. **[CC: 4]**.

Refereed Demo Papers

D.4 Raikwar, A.[†], Plabst, L.[†], and **Ortega, F. R**. (2022). ARtisan Bistro: A Cooking Task Environment to Conduct Studies in Augmented Reality. In *The 21st IEEE International Symposium on Mixed and Augmented Reality* (ISMAR). October 17 - 21, 2022, Singapore, Singapore. IEEE, pp. 909–910. DOI: https://doi.org/10.1109/ISMAR-Adjunct57072.2022.00200. **[CC: 6]**.

D.3 🏆 Pustejovsky, J., Krishnaswamy, N., Beveridge, R., Patil, D.†, McNeely-White, D.G.†, Wang, H.†, and **Ortega, F. R**. (2020). Situational Awareness in Human-Computer Interaction: Diana's World. In *International Conference on Artificial Reality and Telexistence & Eurographics Symposium on Virtual Environments (ICAT-EGVE)*: Demos. December 2 - 4, 2020. ACM and Eurographics. ★ **Best Demo Award**. DOI: https://doi.org/10.2312/egve.20201282. **[CC: 1]**.

D.2 Raikwar, A. †, Stephens, J., and **Ortega, F. R**. (2020). Demo: Assessing Sports Related Concussion in Soccer Players Using Immersive VR Soccer. In *2020 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW)*. March 22 - 26, Atlanta, GA, USA. IEEE, pp. 822–823. DOI: https://doi.org/10.1109/VRW50115.2020.00262. 2020. **[CC: 1]**

D.1 Balcazar, R.‡, **Ortega, F. R.**, Tarre, K.‡, Barreto, A., Weiss, M., and Rishe, N. D. (2017). [DEMO] CircGR: Interactive Multi-Touch Gesture Recognition using Circular Measurements. In *Proceedings of the 2017 ACM on Interactive Surfaces and Spaces (ISS '17)*. Brighton, England. Association for Computing Machinery, pp. 12–21. DOI: https://doi.org/10.1145/3132272.3134139. **[CC: 10]**.

Pre-Prints (submitted)

X.4 Taylor, A., Tanjim, T., Cao, H., Nicoly, J. B., Segal, J. I.‡, George, J. S., Kim, S., Ching, k., **Ortega, F. R.** , and Lee, H. R. (2025). Co-Designing Augmented Reality Tools for High-Stakes Clinical Teamwork. Art. no. arXiv:2502.17295. doi: https://doi.org/10.48550/arXiv.2502.17295. **[CC: 3]**.

X.3 Borhani, Z.†, Ebrahimpour-Boroojeny, A., and **Ortega, F. R**. (2025). Small Cues, Big Differences: Evaluating Interaction and Presentation for Annotation Retrieval in AR. Art. no. arXiv:2509.11401, 2025. doi: https://doi.org/10.48550/arXiv.2509.11401.

X.2 Pharmer, R. L.†, Wickens, C. D., Plabst, L.†, Clegg, B. A., Hirshfield, L. M. Lewis, J. E. , Nicoly, J. B., Spencer, C. A., **Ortega F. R**. (2025). The Impact of Simple, Brief, and Adaptive Instructions within Virtual Reality Training: Components of Cognitive Load Theory in an Assembly Task. Art. no. arXiv:2507.20943, 2025. DOI: https://doi.org/10.48550/arXiv.2507.20943.

X.1 Clegg, B. A., Karduna, A.†, Holen, E.†, Garcia, J.†, Rhodes, M. G., and **Ortega, F. R.** (2024). Multimedia and Immersive Training Materials Influence Impressions of Learning but Not Learning Outcomes. Art. no. arXiv:2407.05504. DOI: https://doi.org/10.48550/arXiv.2407.05504.

Conference Courses

C.1 **Ortega, F. R.**, Williams, A. S.†, Garcia, J†. (2020). Multi-modal gesture elicitation methodology for children. In *Proceedings of the 2020 ACM Interaction Design and Children Conference: Extended Abstracts (IDC '20)*. Association for Computing Machinery. New York, NY, USA, pp. 85–88. DOI: https://doi.org/10.1145/3397617.3401808. **[CC: 1]**.

Other Referred Papers

O.1 Aazhang, B., Abler, R. T., Allebach, J. P., Bost, L. F., Cavallaro, J. R., Chong, E. K. P., Coyle, E. J., Cullers, J. B. S., Dennis, S. M., Dong, Y., Enjeti, P. N., Filippas, A. V., Froyd, J. E., Garmire, D., George, J., Gilchrist, B. E., Hohner, G. S., Hughes, W. L., Johnson, A., Kim, C., Kim, H., Klenke, R. H., Lagoudas, M. Z., Llewellyn, D. C., Lu, Y., Lybarger, K. J., Marshall, S., Muralidharan, S., Ohta, A. T., **Ortega, F. R.**, Riskin, E. A., Rizzo, D. M., Ryder, C. R., Shiroma, W. A., Siller, T. J., Sonnenberg-Klein, J., Sadjadi, S. M., Strachan, S. M., Taheri, M., Woods, G. L., Zoltowski, C. B., Fabien, B. C., Johnson, P., Collins, R., and Murray, P. (2017). Vertically Integrated Projects (VIP) Programs: Multidisciplinary Projects with Homes in Any Discipline In *ASEE Annual Conference & Exposition*, Columbus, Ohio. June 2017. DOI: https://peer.asee.org/29103.

Scientific/Trade Magazine Articles

M.1 Williams, A. S.[†]and **Ortega, F. R.** (2020). Evolutionary gestures: when a gesture is not quite legacy biased. (2020). In *Interactions* 27, 5 (September - October 2020), 50–53, https://doi.org/10.1145/3412499. **[CC: 11]**.

M.2 Steed, A., **Ortega, F. R.**, Williams, A. S.[†], Kruijff, E., Stuerzlinger, W., Batmaz, A. U., Won, A.S., Rosenberg, E.S., Simeone, A.L., and Hayes, A. (2020). Evaluating immersive experiences during Covid-19 and beyond. In *Interactions* 27, 4 (July - August 2020), 62–67, https://doi.org/10.1145/3406098. **[CC: 95]**.

Invited Papers

I.1 Bolivar, S.[‡], Perez, D., Carrasquillo, A., Willams, A. S.[†], Rishe, N. D., and **Ortega, F. R.** (2019). 3D Interaction for Computer Science Educational VR Game. In *Universal Access in Human-Computer Interaction. Virtual, Augmented, and Intelligent Environments.* UAHCI 2019. Orlando, FL.https://doi.org/10.1007/978-3-030-23560-4_30. **[CC: 10]**.

I.2 O-larnnithipong, N., Barreto, A., Ratchatanantakit, N., Tangnimitchok, S., and **Ortega, F. R.** (2018). Real-Time Implementation of Orientation Correction Algorithm for 3D Hand Motion Tracking Interface. In *Universal Access in Human-Computer Interaction. Methods, Technologies, and Users.* UAHCI 2018. Lecture Notes in Computer Science, Springer, vol 10907, pp. 228–242. Invited session: Spatial User Interaction Beyond the Mouse, Las Vegas, NV.https://doi.org/10.1007/978-3-319-92049-8_17. **[CC: 6]**

I.3 Bolivar, S.[‡], **Ortega, F. R.**, Zock-Obregon, M.[‡], and Rishe, N. (2018). 3D Spatial Gaming Interaction to Broad CS Participation. In *Universal Access in Human-Computer Interaction. Virtual, Augmented, and Intelligent Environments.* UAHCI 2018. Lecture Notes in Computer Science, Springer, vol 10908, pp. 39–47. Invited session: Spatial User Interaction Beyond the Mouse, Las Vegas, NV. DOI: https://doi.org/10.1007/978-3-319-92052-8_4. **[CC: 2]**.

I.4 Torres, N.[‡], **Ortega, F. R.**, Bernal, J.[‡], Barreto, A., and Rishe, N. D. (2018). Towards Multi-Modal Interaction with Interactive Paint. In *Universal Access in Human-Computer Interaction. Virtual, Augmented, and Intelligent Environments.* UAHCI 2018. Lecture Notes in

Computer Science, Springer, vol 10907, pp. 299–308. Invited session: Spatial User Interaction Beyond the Mouse, Las Vegas, NV. DOI: https://doi.org/10.1007/978-3-319-92049-8_22. **[CC: 2]**.

I.5 Vassigh, S., **Ortega, F. R.**, Barreto, A., Tarre, K.[‡], and Maldonado, J. (2018). Use of 3D Human-Computer Interaction for Teaching in the Architectural, Engineering and Construction Fields. In *Universal Access in Human-Computer Interaction. Virtual, Augmented, and Intelligent Environments.* UAHCI 2018. Lecture Notes in Computer Science, Springer, vol 10908, pp. 149–159. Invited session: Spatial User Interaction Beyond the Mouse, Las Vegas, NV. **[CC: 5]**.

Non-Refereed Articles

N.1 **Ortega, F. R.**, Barreto, A., Rishe, N., and Adjouadi, M. (2012). Towards 3D Data Environments Using Multi-Touch Screens. In *ACHI 2012: The Fifth International Conference on Advances in Computer-Human Interactions*, pp. 118–121. **[CC: 1]**.

Software Products

S.2 AR Bistro. AR application for researchers to test different experiment conditions (e.g., Notifications, interaction, etc.). Presented as a demo in *IEEE ISMAR*. Released 2023. Available at: https://github.com/NuiLab/Virtual-Reality-Soccer-Testbed-for-Concussion-Experiments.

S.1 Virtual Reality Soccer for Concussion TestBed. An application that allows people to test baseline and athletes with concussions. Presented as a demo in *IEEE VR*. Released 2023. Available at: https://github.com/NuiLab/ARtisan-Bistro

Miscellaneous

Y.1 Rishe, N. D. , Adjouadi, M., and **Ortega, F. R**. (2020). Smart Bracelets for Remote Monitoring of Wearers' Physical and Affective State". In *2020 9th Mediterranean Conference on Embedded Computing (MECO)*, Budva, Montenegro, pp. 1-1, https://doi.org/10.1109/MECO49872.2020.9134093.

Dissertations

Z.1 **Ortega, F. R**. (2014). 3D navigation with six degrees-of-freedom using a multi-touch display. Ph.D. Dissertation. Florida International University. December 2014. DOI: https://doi.org/10.25148/etd.FI14110721.

CONTRACTS & GRANTS SUMMARY

The following information summarizes the **external** funding record for Dr. Ortega. Internal funding is listed but not included in the total external funding.

- **2025 Submissions and Status**: NSF Brain (rejected), ONR MURI (Rejected), Huo Family Foundation (rejected), **NSF I-USE (Accepted)**, NSF EDU CORE (pending). Five total submissions, one accepted, one pending, three rejected of the 2025 submissions.

- **2025 active grants**: ONR (VR training), NSF CAREER, ONR DURIP, NSF I-USE. Total 4. In addition, an NSF REU supplemental is active.
- **2025 totals**: $300,000 from ONR Option 1 activated, $750,000 from NSF I-USE (co-PI), $20,000 from NSF. Internal funding was awarded in the amount of $7,500.
- **CSU Overall Summary (committed)**: Total of external funding. $3,842,316; As PI: $4,220,439; As co-PI: $730,981. Note that $271,777 of the $430,989 of co-PI funding came from a supplemental from an existing DARPA CWC program. While I was part of the last year's program as a co-PI, I'm not counting that amount since I was not part of the original submission. I'm only reporting in the totals the white paper that we were awarded Internal CSU funding $232,300.

CONTRACTS & GRANTS

Externally-Funded Projects as PI

12. PI: ONR DURIP. "Training Optimization for US Navy and Marine Radio Operations to Assess Cognitive Load and the Managing Extraneous Load". $500,000. March 2024 – February 2026.
11. PI: NSF IIS HCC. "CAREER: HCC: Microgesture and Multimodal Interaction Techniques for Augmented Reality". $600,000. August 2022 – July 2028.
    - NSF REU Supplemental $20,000. 6/1/2024 – 5/30/2025.
10. PI: Assessing Cognitive Load and Managing Extraneous Load to Optimize Training. $750,000. Office Of Naval Research. March 1, 2023 – August 15, 2026. 2-year option for an additional $600,000. Year 1 option for $300,000 activated. Total awarded as of now: $1,050,000.
9. PI: Perceptual/Cognitive Aspects of Augmented Reality: Experimental Research and a Computational Model. $900,000. Office Of Naval Research. August 16, 2021 – August 15, 2024. Status: Completed.
8. PI: "Ego-Centric Emotion Recognition using Augmented Reality Headsets (CSU - I2O Postdoctoral Fellowship - Ego-Centric Emotion Recognition)". 01/01/2022 – 12/31/2023. DARPA-RA-21-02. $299,957. Status: Completed.
7. PI: "WAR Fighting Performance: Augmented Reality Multi-Modal Interaction Techniques for JTAC and Battlefield Readiness." Defense University Research Instrumentation Program (DURIP). $201,420. DOD-NAVY-ONR-Office of Naval Research. 05/14/2020. Funded: 08/30/2021 – 07/30/2023. Status: Completed.
6. PI: "CRII: CHS: Understanding Gesture User Behavior in Augmented Reality Headsets." $175,000. NSF CRII NSF 19-579. 2019. 8/1/2020 – 7/31/2022. Status: Completed.
    - NSF REU Supplemental $16,000. 6/1/2023 – 5/30/2024.
    - NSF REU Supplemental $16,000. 6/1/2022 – 5/30/2023.
    - NSF REU Supplemental $16,000. 8/1/2020 – 7/30/2021.

5. PI: "CCRI: Planning: Collaborative Research: Low-Latency for Augmented Reality Interactive Systems (LLARIS)." $100,000. NSF 19-512 CCRI. 10/1/2020 – 9/31/2022 Collaborative proposal between CSU, Tennesse Tech, and University of Nebraska Omaha. Status: Completed.

    - NSF REU Supplemental $16,000. 5/1/2022 – 4/30/2023.
    - NSF REU Supplemental $16,000. 5/1/2021 – 4/30/2022.

4. PI: "Fused Augmented Realties with Synthetic Vision (FAR/SV) Systems for Ground Forces VR Rehab, Inc.",$198,914). ONR subAward via VRR. 07/23/2019 – 11/30/2023. Status: Completed.

3. PI: "N202-090 – Single Amphibious Integrated Precision Augmented Reality Navigation (SAIPAN) System via Fused Augmented Realities- User Interface (FAR-UI)" $44,000. SBIR Phase I with VRR via ONR. Awarded: 08/2020. Status: Completed.

2. PI: "NIH-NIDA SUD Challenge – BioBrace VR: Bio-Interactive Device with Personalized Avatar Therapy for SUD". $10,000. Awarded to BioMagic VR, Inc. (spawn from FIU) in preparation for STTR/SBIR. Status: Completed.

1. PI: "NSF SBIR Phase IIA: 2.5D Extensions to Braille-based User Interaction". Polymer Braille Inc. $105,000. Award AWD000000006592, Project No: 800007091. May-18-2016. (Sub-Award). 04/18/16–04/17/17. Status: Completed.

Externally-Funded Projects as co-PI

4. co-PI "Collaborative Research: Improving Conceptual Understanding of Invisible Physics by Translating the Science of Learning into Virtual Reality Environments", $750,000$. NSF. NSF I-USE NSF 2439474. Awarded 10/1/2025 – 9/30/2028. Status: Active.

3. co-PI "FW-HTF-P: Optimizing Long-Term Human Performance in Future Work.", $150,000. NSF, BCS 1928502. Program: Future of Work at the Human-Technology Frontier. Allocation funds to Computer Science Department: 80%, including 1 GRA for 3-4 semesters, supplies, and faculty effort. PI: Benjamin Clegg, Psychology, CSU. Period: 09/01/2019 – 08/31/2021. Status: Completed.

2. co-PI "Communication through Gestures, Expression, and Shared Perception." CWC DARPA Award via DOD-ARMY. co-PI as of Fall 2019. $2,433,843. 07/31/2015 - 08/30/2021. PI: J. Ross Beveridge, Computer Science, CSU. Status: Active. Active participant on the project since Fall 2018 and co-PI of the white paper that spawned Fox World project which included additional money. Status: Completed.

    - co-PI "Innovative Embodied Agent Approaches to Assessment with Developmental and Intervention Science Applications". Supplemental to CWC DARPA. Faelyn Fox (World). PI: Dr. J. Ross Beveridge. $271,777. 7/31/2020 – 8/30/2021. Status: Completed.

1. co-PI: Florida Center for Cybersecurity (FC^2), University of South Florida. "Using a Cyberlearning Environment to Enhance Critical Cybersecurity Education". $100,000. 2017. PI: Peter Clarke, Computer Science, FIU. Status: Completed.

Externally-Funded Projects as Investigator or role other than PI or co-PI

5. I: "Post-Occupancy Engagement: Exploring Augmented Reality Technology as a Tool for Assessing and Enhancing Effectiveness of Building Design Strategies." $9,989. Awarded by American Society of Interior Designers (ASID). PI: Leah Scolere, Interior Design, CSU. 10/10/2019 – 12/30/2021. PI: Leah Scolere, Interior Design, CSU. Use of funds: 50% of award will be used for a Computer Science student. Status: Completed.

4. I: "Florida Consortium of Metropolitan Research Universities, Summer Grant". $3,000. 2016. Status: Completed.

3. I: "IUCRU CAKE additional membership fees from OverIT (Italian-based company)". $3,000. June, 2016. Status: Completed.

2. I: "IUCRU CAKE membership fees from OverIT (Italian-based company)". $5,000. June, 2016. Status: Completed.

1. I: "IUCRU CAKE membership fees from Polymer Braille Inc". $5,000, June, 2016. Status: Completed.

Externally-Funded Gifts, Donations, or In-kind Contributions

5. Dan Marino Foundation. Improving User Interfaces for Young Adults with Autism. $25,500. May 2023.

4. Dan Marino Foundation. Improving User Interfaces for Young Adults with Autism. $40,500. August 2022.

3. HP. 2 HP Omnicept & HP Reverb G2 Omnicept Edition. (2 x $1249). $2498. 2021.

2. Logitech. 3 VR Ink Pilot Edition. (3 x $750). $2250. 2021.

1. Boettcher Foundation, $500.00 gift to Francisco R. Ortega for Virtual Reality Soccer for Concussions. 2019.

Internally-Funded Awards

11. I: Francisco R. Ortega. CNS Dean's award. $7,500. Close the gap between XR and AI. 2025—2026.

10. I: Francisco R. Ortega. Accelerating transdisciplinary research on nature and health in Northern Colorado. College of Human Dimensions of Natural Resources. 2024. $50,000.

9. PI: Francisco R. Ortega. Research Infrastructure. CSU's OVPR Quarterly. January 2022. $16,000.

8. co-PI: Francisco R. Ortega. VetVR Virtual Reality for Veterinarians. CSU's OVPR CIP program (3 year program) $196,076. PI: Pedro Boscan. 2020–2023 (Dr. Ortega's role ended in August 2021). Ortega's portion: $65,539.

7. PI: Francisco R. Ortega. Library award to build open-source content for human-computer interaction. $4,000. 2020.

6. I: "Development of VR Applications for Education and Training". $18,117. Awarded by Provost Miranda, Digital Learning Initiative. 01/07/2020 – 06/30/2021. PI: Pedro Boscan, Veterinary School, CSU. Status: Completed.

5. I: "Support for Veterinary VR Application", $24,000. Awarded by the College of Veterinary Medicine & Biomedical Sciences (CVMBS) IT governance. Partial salary for VR Developer. 2019. PI: Pedro Boscan, Veterinary School, CSU. Status: Active.

4. PI: CSU Graduate School. Student Recruitment Mini-Grant. "UTEP Recruitment to CSU"$500. Awarded Nov, 2019.

3. PI: OVPR Special Research Award. $26,644. Awarded Nov, 2019.

2. CSU Cybersecurity Center. Created a course, Introduction to Digital Forensics. One month's salary for. $̃12,000 (including fringe). Summer 2019.

1. PI: CSU Graduate School. Student Recruitment Mini-Grant. "FIU Recruitment to CSU" $500. Awarded Nov, 2018.

0. I: FIU. Miami-Dade Age-Friendly Mini-Grant 2018. $2,500. Awarded Aug, 2018.

TALKS

Keynotes

1. **Ortega, F.** "Augmented Reality Multimodal Interaction Techniques for Immersive Analytics". At *Embodied Mathematical Imagination and Cognition: Professional Development for Undergraduate Mathematics Instructors.* NSF-DUE, Grant #1835409. September 26, 2021. Fort Collins, Colorado.

2. **Ortega, F.**, "Immersive Analytics and the Quest for the General-Purpose Augmented Reality System". At *University of Nebraska at Omaha Workshop on XR.* February, 26, 2021.

Invited Talks

3. **Ortega, F.**, Li, J., Naidu, T., Asif, A. CSU Ramtalk. Invited by CSU Ramtalk. Fort Collins, CO. 2025.

4. **Ortega, F.**, Buckman, M., Masters, R., Naidu, T., Asif, A., CSU Ramily Event. Invited by the CSU President's advanced team. CSU Spur Campus, Denver, CO. 2025.

5. **Ortega, F.** "Towards Multimodal Interaction for Augmented and Virtual Reality". At *Universidad De Chile.* Invited by Dr. Francisco Gutierrez. Santiago, CL. December 4, 2025.

6. **Ortega, F.** "Multimodal Interaction for Virtual Reality Sketching". At *Pontifical Catholic University of Rio de Janeiro (PUC RIO).* Invited by Dr. Greis Silva. Rio De Janeiro, Brazil. October 24, 2025.

7. **Ortega, F.** "AR Notifications". At *University of Rennes*. Invited by Dr. Anne-Helena Olivier. Rennes, France. July 9th, 2025.

8. **Ortega, F.** "Virtual Reality Forest Bathing: Design for Optimal Stress Reduction". At *Unviersity of Paris-Saclay*. Invited by Dr. Tifanie Bouchara. Paris, France. July 7th, 2025.

9. **Ortega, F.**, "VR Forest Bathing". At *Universidad De Chile*. Invited by Dr. Francisco Gutierrez. Santiago, CL. December 12, 2024.

10. **Ortega, F.**, "VR Forest Bathing". At *Cornell Tech, New York*. Invited by Dr. Angelique Taylor. New York, NY. November 6, 2024.

11. **Ortega, F.**, "Multimodal Interaction". At *Montana State University*. Invited by Dr. John Paxton. Bozeman, MT. November 11, 2023.

12. **Ortega, F.**, "XR For the STEAM Team". At *Conchita Espinoza Academy*. Invited by Ms. Jimena Cruz. Miami, FL. October 18, 2024.

13. **Ortega, F.**, "Forest Bathing in VR". At *Pontifical Catholic University of São Paulo* (remote). Invited by Dr. Greis Silva. May, 24, 2024.

14. **Ortega, F.**, "Forest Bathing in VR". At *University of Würzberg*. Invited by Dr. Marc Erich Latoschik. April 28, 2023.

15. **Ortega, F.**, "Towards Multimodal Interaction for Augmented and Virtual Reality". At *University of Texas at Dallas* (remote). Invited by Dr. Isaac Cho. April 11, 2024.

16. **Ortega, F.**, "Towards Multimodal Interaction for Augmented and Virtual Reality and Beyond". At *Colorado State University (BMAC)*. Invited by Dr. Sudipto Ghosh. February 26, 2024.

17. **Ortega, F.**, "Towards Multimodal Interaction for Augmented and Virtual Reality", *Tour de NUILAB Fall 2023 Edition*. At *Montana State University*, Department of Computer Science. Bozeman, Montana. Invited by Dr. Paxton, John Paxton. November 13, 2023.

18. **Ortega, F.**, "Multimodal Interaction in Augmented Reality", *Tour de NUILAB Fall 2023 Edition*. At *University of Texas, Dallas*, Department of Computer Science. Virtual. Invited by Dr. Balakrishnan Prabhakaran. October 25, 2023.

19. **Ortega, F.**, "Biomass for Stress Reduction in VR Forest Bathing", *Tour de NUILAB Fall 2023 Edition*. At *University of Wurzburg*, Chair of Human-Computer Interaction, Department of Computer Science. Wurzburg, Germany. Invited by Dr. Marc Erich Latoschik. April 27, 2023.

20. **Ortega, F.**, "Virtual Reality Forest Bathing: Designing for Optimal Stress Reduction", *Tour de NUILAB Spring 2023 Edition*. At *University of Connecticut*, Department of Communication. Storrs, CO. Invited by Dr. Svetlana Kalnova. March 2nd, 2023.

21. **Ortega, F. R.,** "Clutter and Information Access Effort Trade-Off in Augmented Reality Head-Mounted Displays for Visual Search", *Tour de NUILAB Spring 2023 Edition*. At *University of Connecticut*, Department of Computer Science and Engineering. Storrs, CO. Invited by Dr. Qian Yang. March 2nd, 2023.

22. **Ortega, F.**, "Understanding the Effects of Biomass in Virtual Reality ", *Tour de NUILAB Chile 2022 Edition.* At *Universidad Tecnica Federico Santa Maria*, Departamento de Informatica. Valparaiso, Chile. Invited by Dr. Claudia Lopez. May 24, 2022.

23. **Ortega, F.**, "Immersive Analytics: The Conflict In The Land Between the Gulfs.", *Tour de NUILAB Chile 2022 Edition.* At *Universidad Catolica de Chile*, Ciencias de la Computación. San Joaquín, Santiago, Chile. Invited by Dr. Valeria Herskovic. May 27, 2022.

24. **Ortega, F.**, "Clutter and Information Access Effort Trade-Off in Augmented Reality Head-Mounted Displays", *Tour de NUILAB Chile 2022 Edition.* At *Universidad de Chile*, Ciencias de la Computación. Ñunoa, Santiago, Chile. Invited by Dr. Francisco Gutierrez. May, 31st, 2022.

25. **Ortega, F.**, "Multimodal Interaction and The Case for Microgestures in Augmented Reality", *Tour de NUILAB Fall 2022 Edition.* At *Carleton University*, School of Information Technology. Ottawa, Canada. Invited by Dr. Rob Teather. October, 2022

26. **Ortega, F.**, "Multimodal Interaction and The Case for Microgestures in Augmented Reality", *Tour de NUILAB Fall 2022 Edition.* At *Dalhousie University*, Computer Science. Halifax, Canada. Invited by Dr. Mayra Barrera-Machuca. October, 2022

27. **Ortega, F.**, "Multimodal Interaction and The Case for Microgestures in Augmented Reality", *Tour de NUILAB Fall 2022 Edition.* At *Concordia University*, Computer Science and Software Engineering. Montreal, Canada. Invited by Dr. Anil Ufuk Batmaz. October, 2022

28. **Ortega, F.**, "Multimodal Interaction for Immersive Analytics using Augmented Reality Headsets". At *Universidad Centroamericana José Simeón Cañas*, Congreso de Ingenieria y Arcquitectura. San Salvador, Salvador. Remote. Invited by Mr. Ronaldo.Canizales Turcios. October 14, 2022.

29. **Ortega, F.**, "Multimodal Interaction and The Case for Microgestures in Augmented Reality", *Tour de NUILAB Fall 2022 Edition.* At *Mississippi State University (MSU)*, Computer Science. Invited by Dr. Adam Jones. October 28, 2022

30. **Ortega, F.**, "Multimodal Interaction and The Case for Microgestures in Augmented Reality", *Tour de NUILAB Fall 2022 Edition.* At *University of California at Santa Barbara (UCSB)*, Computer Science. Invited by Dr. Misha Sra. November, 2022

31. **Ortega, F.**, "Multimodal Interaction and The Case for Microgestures in Augmented Reality", *Tour de NUILAB Fall 2022 Edition.* At *Boston College*, Computer Science. Invited by Dr. Maira Marques Samary. November, 2022.

32. **Ortega, F.**, "Multimodal Interaction and The Case for Microgestures in Augmented Reality", *Tour de NUILAB Fall 2022 Edition.* At *University of Illinous at Chicago*, Computer Science. Invited by Dr. Nikita Soni. November, 2022.

33. **Ortega, F.**, "Multimodal Interaction and The Case for Microgestures in Augmented Reality", *Tour de NUILAB Fall 2022 Edition.* At *University of Illinous at Chicago*, Computer Science. Invited by Dr. Nikita Soni. November, 2022.

34. **Ortega, F.**, "Multimodal Interaction and The Case for Microgestures in Augmented Reality", *Tour de NUILAB Fall 2022 Edition.* At *Florida International University*, Knight Foundation School of Computing and Information Sciences. Computer Science. Invited by Dr. Alex Afanasyev. December 2, 2022.

35. **Ortega, F.**, "The Natural User Interaction Lab". At *Ricoh Corporation.* Invited by Ms. Nicole Blohm . December 13, 2022.

36. **Ortega, F.**, "Multi-Modal User Interaction: Gesture + Speech using Augmented Reality Headsets". At *University of Texas at El Paso (UTEP).* Invited by Dr. Ann Gates. February 28, 2020.

37. **Ortega, F.**, " Multi-Modal User Interaction: Gesture + Speech using Augmented Reality Headsets.". At *University of Colorado at Boulder (CU).* Invited by Dr. Danielle Szafir. January 29, 2020.

38. **Ortega, F.**, "The Future of Interactive Computing." At *Fort Collins Museum of Discovery.* Invited by Mrs. Shannon Quist and Mr. Ben Gondrez. December 12, 2019.

39. **Ortega, F.**, "Gesture Elicitation and Recognition." At *Universidad de los Andes*, Invited by Dr. Pablo Figueroa, Associate Professor. September 6, 2019.

40. **Ortega, F.**, "Opportunities at Colorado State University for Undergraduate and Master Students." At *Florida International University*, Invited by Dr. Ram Iyengar, Director, FIU SCIS. October 12, 2018.

41. **Ortega, F.**, "How to Prepare for a Job in Academia and Opportunities at Colorado State University." At *Florida International University*, Invited by Dr. Ram Iyengar, Director, FIU SCIS. October 12, 2018.

42. **Ortega, F.**, "Cyber Security – Methods and Latest Attacks." At *Universidad Tecnologica de Honduras*, Invited by Ruben Fernandez, July 28, 2018 (Remote via Skype).

43. **Ortega, F.**, "Towards 3D navigation Using Multi-Touch Displays." At *University of Florida (Computer Science).* Invited by Dr. Lisa Anthony. Gainesville, FL, 2015.

44. **Ortega, F.**, "Towards 3D Navigation using Multi-Touch." In *McKnight Yearly Fellowship Meeting*, Tampa, FL, 2014.

45. **Ortega, F.**, "Feature Extraction for Multi-Touch." In *McKnight Fellowship* at FIU, Miami, FL, January 23rd, 2014.

46. **Ortega, F.**, "3D Navigation with Commodity Devices and the Formalization of Multi-Touch Language." At *University of Leeds*, Colloquium Friday Series. Invited by Dr. Roy Ruddle. Leeds, England, October 18, 2013.

47. **Ortega, F.**, "Motivating Young Minds: Computer Science and Human-Computer Interaction." Guest for Career Day at W.R Thomas Middle School, Miami, FL, 13001 SW 26 Street, MIAMI, FL 33175, May 2nd, 2012.

Invited Panels

48. Fields, L., Mathis, C., **Ortega, F.** (discussant). "Models/Technologies: Physics/Computer Science/Communication Sciences" in *2024 McKnight Annual Fellows' Meeting and Research & Writing Conference*, Tampa, FL. November, 23, 2024.

49. Williams , T., Moon, D., Paulius, D., **Ortega, F.** (discussants), and Simmonds, D. (discussant), "A Glimpse at the Intelligent Robots of Tomorrow" in *McKnight Mid-Year Research & Writing Conference*, Tampa, FL. February 25, 2017.

Conference Courses and Tutorials

50. Williams, A. and **Ortega, F. R.**. " An Introduction to Elicitation Study Design". Course for International Human-Computer Interaction Conference, 2022.

51. **Ortega, F. R.**, Williams, A.†, and Garcia, J.†. "Multi-Modal Gesture Elicitation Methodology for Children". June 18, 2020 (14:00-22:00 BST), https://www.cs.colostate.edu/ElicitationCourse.

Conference Talks (Refereed)

52. **Ortega, F.**, "Multi-modal Interaction: Gesture+Speech." At *2019 CMD-IT Academic Career Workshop*, Houston, TX. May 16, 2019.

53. **Ortega, F.**, "Selection and Manipulation Whole-Body Gesture Elicitation Study In Virtual Reality." At *2019 IEEE Conference on Virtual Reality and 3D User Interfaces (VR), Workshop on Novel Input Devices and Interaction Techniques (NIDIT)*, Osaka, Japan, 2019. March 24, 2019.

54. **Ortega, F.**, "CubeVR: Digital Affordances for Architecture Undergraduate Education using Virtual Reality." At *2019 IEEE Conference on Virtual Reality and 3D User Interfaces (VR), Workshop on Novel Input Devices and Interaction Techniques (NIDIT)*, Osaka, Japan, 2019. March 23, 2019.

55. **Ortega, F.**, "Hand Tracking Interface for Virtual Reality Interaction based on MARG sensors." At *2019 IEEE Conference on Virtual Reality and 3D User Interfaces (VR), Workshop on Novel Input Devices and Interaction Techniques (NIDIT)*, Osaka, Japan, 2019. March 24, 2019.

56. **Ortega, F.**, "Towards Multi-Modal Interaction with Interactive Paint." In *2018 HCI-International*. Invited session: Spatial User Interaction Beyond the Mouse, Las Vegas, NV, 2018.

57. **Ortega, F.**, "The Tabletop is dead. Long Live the Tabletop!". In *The Disappearing Tabletop: Social and Technical Challenges for Cross-Surface Collaboration* workshop on Interactive Surfaces and Spaces (ISS '17). Brighton, United Kingdom. 2017.

58. **Ortega, F. R.** and Tarre, K.[‡], "Gesture Elicitation for 3D Travel via Multi-Touch and Mid-Air Systems for Procedurally Generated Pseudo-Universe." In *2017 IEEE Symposium on 3D User Interfaces (3DUI)*, Los Angeles, CA, March, 2017.

59. **Ortega, F. R.**, "Towards a 3D Virtual Programming Language to Increase the Number of Women in Computer Science Education." In *2017 IEEE Virtual Reality Workshop on K-12 Embodied Learning through Virtual & Augmented Reality (KELVAR)*, Los Angeles, CA, March 2017.

60. **Ortega, F.**, "Smart Learning Desk: Towards an Interactive Classroom." In *IEEE Virtual Reality 2016 Workshop on K-12 Embodied Learning through Virtual & Augmented Reality*, Greenville, SC, March 19, 2016.

61. **Ortega, F.**, "GyroTouch: Wrist Gyroscope with a Multi-Touch Display." In *HCI International 2015*, Los Angeles, CA, August, 2015.

62. **Ortega, F.**, "PeNTa: Formal Modeling for Multi-Touch Systems Using Petri Nets." In *HCI International 2014*. Crete, Greece, June, 2014. **[CC: 1]**.

Poster Fast-Forwards or Presentations (Refereed)

63. **Ortega, F.**, Poster Presentation. "Beyond the Wizard of Oz: Using Imperfect Machine Learning to Examine the Impact of Reliability of Augmented Reality Cues on Visual Search Performance." In *2023 IEEE International Symposium on Mixed and Augmented Reality (ISMAR)*, Sydney, Australia. Oct 2023.

64. **Ortega, F.**, Poster Presentation. "A Virtual Reality System for Gender Swapping to Increase Empathy against Stereotype Threats in Computer Science Job Interviews." In *2023 IEEE International Symposium on Mixed and Augmented Reality (ISMAR)*, Sydney, Australia. Oct 2023.

65. **Ortega, F.**, "Selection and Manipulation Whole-Body Gesture Elicitation Study In Virtual Reality." In *2019 IEEE Conference on Virtual Reality and 3D User Interfaces (VR)*, Osaka, Japan. March, 2019.

66. **Ortega, F.**, "Towards first person gamer modeling and the problem with game classification in user studies." In *Virtual Reality Software and Technology (VRST '18)*. Poster demonstration only (no fast-forward talk). Tokyo, Japan, Nov. 29, 2018.

67. **Ortega, F.**, "PostureMonitor: Real-Time IMU Wearable Technology to Foster Poise and Health." In *HCI International 2015*. Los Angeles, CA, Aug. 2015.

68. **Ortega, F.**, "TAMGeF: Touch-midAir-Motion Framework for Spatial Input." In *ACM Symposium on Spatial User Interaction*, (Fast Forward). Los Angeles, CA, Aug. 2015.

69. **Ortega, F.**, Poster Presentation. "Exploring Modeling Language for Multi-Touch Systems Using Petri Nets." In *ACM Interactive Tabletop and Surfaces* (ITS '13), St. Andrew, Scotland. 2013.

70. **Ortega, F.**, Poster Presentation and Fast-Forward, "Augmenting Multi-Touch with Commodity Devices." In *CM Symposium on Spatial User Interaction* (SUI '13), Los Angeles, CA, 2013.

71. **Ortega, F.**, Poster Presentation and Fast Forward, "Poster: Real-Time Gesture Detection for Multi-Touch Devices." In *IEEE 8th Symposium on 3D User Interfaces* (3DUI '13), Orlando, FL, Mar. 16th, 2013.

Research Demonstrations (Refereed)

72. Raikwar, A.[†]and **Ortega, F.**, "Demo: Assessing Sports Related Concussion in Soccer Players Using Immersive VR Soccer." At *in IEEE VR and 3DUI 2020*, Atlanta, GA, USA. 2020. March, 2020. Virtual.

73. **Ortega, F. R.**, "[DEMO] CircGR: Interactive Multi-Touch Gesture Recognition using Circular Measurements". Demonstrated Demo in *Interactive Surfaces and Spaces (ISS '17)*. Brighton, England. 2017.

Research Demonstrations (Invited)

74. **Ortega, F.**, Pharmer, R., Plabst, L., Kelley, B., Natural User Interaction Lab Projects showcased in *I/ITSEC 2024*, Navy Booth. Orlando, FL. December, 2024.

75. **Ortega, F.**, Game Changers: NUILAB's Virtual and Augmented Reality Demos. In *Fort Collins Museum of Discovery*. November 3, 2019.

76. Williams, A.S.[†]and **Ortega, F.**, Dual NUILAB Presentation with Demo. In *Fort Collins Museum of Discovery*. December 12, 2019.

77. Boettcher Foundation Trustees Learning Track VR/AR Research Demo. Hosted by Colorado State University. September 6, 2019.

78. **Ortega, F.**, Boettcher Foundation VR/AR Presentation. Hosted by OVPR in the Richardson Design Center, CSU. June 7, 2019.

79. NUILAB. MST Day. In *Colorado State University*. October 3, 2019.

80. NUILAB. MST Day. In *Colorado State University*. October 11, 2018.

Internal Departmental, Guest Lectures, and University-Wide Talks/Events

81. **Ortega, F.** "Discovering a New Reality to Express Yourself. Improving Virtual Reality Art and Sculpting'. At *The Fort Collins Welcome Center*. Invited by CSU. November 5, 2025.

82. **Ortega, F.**, CS 192 CS Freshmen Orientation. One mini-presentation. Fall 2024. Introduction to HCI and VR.

83. **Ortega, F.** and Williams, A.S. †, CS 501, 3 week rotations. Three lectures. NUILAB Topics. Fall 2024.

84. **Ortega, F.**, CS 192 CS Freshmen Orientation. One mini-presentation. Fall 2023. Introduction to HCI and VR.

85. **Ortega, F.** and Williams, A.S. †, CS 501, 3 week rotations. Three lectures. Introduction to NUILAB, Multimodal Interaction, and AR/VR. Fall 2023.

86. **Ortega, F.** and Williams, A.S. †, CS 501, 3 week rotations. Three lectures. Introduction to NUILAB, Multimodal Interaction, and AR/VR. Spring 2023.

87. **Ortega, F.** and Williams, A.S. †, CS 692, 3 week rotations. Three lectures. Introduction to NUILAB, Multimodal Interaction, and Immersive Analytics. Fall 2020.

88. **Ortega, F.**, Virtual Reality Micro Lecture for Summer Engagement Task Force (welcoming new students). 10 participants. July 31, 2020.

89. **Ortega, F.**, NUI LAB Tour and Demonstrations. Jan 23, 2020.

90. **Ortega, F.**, "HCC Concentration and AR/VR Technologies." Virtual Choose CSU for High School students. 20 participants. May, 2020.

91. **Ortega, F.**, NUILAB Tour, Demonstration, and Talk. Choose CSU (Parents and High School Students). 65 Participants. February 1, 2020.

92. **Ortega, F.**, NUILAB Tour and Demonstration. Compass School of Fort Collins (Middle School Students). 15 Participants. December 11, 2019.

93. **Ortega, F.**, NUILAB Tour and Demonstration. Choose CSU (Parents and High School Students) 60 Participants. December 7, 2019.

94. **Ortega, F.**, Virtual and Augmented Reality talk for Girls Who Code, CSU. Invited by Ariana Mims. December 2, 2019.

95. **Ortega, F.**, Guest Lecture: Augmented Reality and Networking. Invited by Dr. Joe Gersch. CS 457. October 3, 2019.

96. **Ortega, F.**, "Gestures and Multi-Modality, Natural User Interaction Lab". CS Faculty Rapid-Fire Presentations of Current Research. September 30, 2019.

97. **Ortega, F.**, "Gestures and Multi-Modality." At *Computer Science Department.* BMAC Rapid Talk. Hosted by Louis-Noel Pouchet. September 9, 2019.

98. **Ortega, F.**, NUILAB Tour and Demonstration. Incoming CSU students and under represented student populations in STEM. Early Start Freshmen. 40 participants. August 20, 2019.

99. **Ortega, F.**, NUILAB Tour and Demonstration. Middle School Girls STEM Camp. 12 participants. June 19, 2020.

100. **Ortega, F.**, NUILAB Tour and Demonstration. Middle School STEM Camp. 20 participants. June 12, 2020.

101. **Ortega, F.**, NUILAB Tour and Demonstration. Incoming CSU students and under represented student populations in STEM. Early Start Freshmen. 40 participants. August 20, 2019.

102. **Ortega, F.**, "Immersive User Interfaces: Driving with Augmented Reality." At *Energy Institute, Colorado State University*. Presentation for Colorado Department of Transportation (CDOT). Invited by Dr. Bradley Thomas, Associate Professor in Mechanical Engineering, CSU. January 30, 2019.

103. **Ortega, F.**, Choose CSU Presentation about Human-Computer Interaction (Parents and High School Seniors). 42 participants for NUILAB tour and 28 participants for presentation. April 6, 2019.

104. **Ortega, F.**, Choose CSU (Parents and High School Seniors). NUILAB Tour. 60 participants. February 7, 2019.

105. **Ortega, F.**, Choose CSU Presentation about Human-Centered Computing. 45 Participants for NUILAB tour and 35 for presentation. February 2, 2019.

106. **Ortega, F.**, "Gesture User Interfaces: Towards the Invisible Computer in 10 Minutes", in *ISTEC*. 10-minute presentation. Oct. 3, 2018.

107. **Ortega, F.**, "Gesture User Interfaces: Towards the Invisible Computer – Rapid Talk", in *Rapid Talk, Graduate Degree in CSU*, Department of Computer Science, CSU. Nov. 7, 2018.

108. **Ortega, F.**, "Gesture User Interfaces: Towards the Invisible Computer", in *Graduate Seminar Talk*, Department of Computer Science, CSU. Sept. 11, 2018.

109. **Ortega, F.**, "Gesture User Interfaces: Towards the Invisible Computer!", in *Freshmen Seminar Talk CS CSU*, Sept. 11, 2018.

110. **Ortega, F.**, "3D Navigation via 2D Multi Touch Surfaces." In *FIU CS PhD Student Seminars*, Miami, FL, Apr. 12th, 2012.

111. **Ortega, F.**, "Looking Ahead: A Case for 3D User Interfaces." Guest Speaker for Florida International University, Software Engineering Course, Miami, FL, Mar. 27th, 2012.

112. **Ortega, F.**, "Natural User Interfaces in 3D Navigation." Guest Speaker Florida International University for Computer Graphics, Miami, FL., Feb. 26th, 2012.

RESEARCH INTERESTS

Dr. Ortega's research expertise is in 3D User Interfaces, part of Human-Computer Interaction. His primary work is in Augmented Reality (AR) and Virtual Reality (VR).

Broadly speaking, his research has focused on multimodal and unimodal interaction (gesture-centric), which includes gesture recognition and elicitation (e.g., a form of participatory design). This research area focuses on improving user interaction by (a) multimodal elicitation, (b) developing interactive techniques, and (c) developing microgesture interaction techniques. The primary domains for interaction include immersive analytics, assembly, and Navy and Marines use cases. His secondary area of research concentrates in AR display interface (i.e., output) to understand information access effort where

different trade-offs are evaluated, including digital and physical clutter, type of tasks, the position of information displays (e.g., widgets), and cues in visual search tasks. Another area of research includes improving training for NAVY us cases using AR/VR with Brain-Computer Interfaces (e.g., fNIRS or EEG). Lately, Dr. Ortega has been interested in the impact that VR can have in health and how perception affects those types of applications. One particular type of environment includes Forest-Bathing. Finally, two exciting new problems that Dr. Ortega is looking into include how the post-Windows-Icon-Menu-Pointer (WIMP) paradigm will look in VR/AR as well as how the role of more accessible interfaces can improve everyday life for people that are less able in certain areas (e.g., non-sighted users, autism spectrum, etc.).

PATENTS

AWARDED PATENTS

4. **Francisco Ortega**, Jules Calella, Naphtali Rishe, S.S. Iyengar. Three Dimensional Touch Conductive Fabric. Publication No. US 20190391683A1. Application No. 16015801. Filed: June 22, 2018. Publication Date: December 26, 2019. Date of Patent: Feb 02, 2021. US10908745B2.

3. **Francisco R. Ortega**, Naphtali Rishe, and Armando Barreto. Wearable Device and Methods of Using The Same. Patent No: US 10,806,375 B2. Date of Patent: Oct 20, 2020. Application No. 15/585,395. Filed: May 3, 2017.

2. **Ortega, F. R.**, Rishe, N. D., and Barreto, A. B., Gesture Discernment and Processing System. Patent No.: US 9,886,190 B2. Date of Patent: Feb. 6, 2018. US Utility Patent filed November 28th, 2014, USPS Application Number 20160091977, publication date March 31st, 2016.

1. Barreto, A., Rishe, N., **Ortega, F.**, O-Larnnithipong, N., VRT: Virtual Round Table. Patent No.: US 9,900,555 B1, Date of Patent: Feb. 20, 2018. Disclosed to FIU, January, 2017. **[CC: 3]**.

APPLICATIONS & DISCLOSURES

3. Raikwar, A.[†](40%), **Ortega, F.** (30%), Stephens, J. (40%). Title: Virtual Reality Soccer for Evaluating Return-to-Play Readiness in Athletes with Concussion. Disclosure: 10/21/2019. Reclaimed back to CSU.

2. Stephens, J. (40%), **Ortega, F.** (30%), Malott, A. (15%), and Youseff, K. Colorado State University. Invention Id: INV19-060. Title: Virtual Reality for Sports-Related Concussion Evaluation. Disclosure approved: 3/14/2019.

1. Flack, J. (49%), Johnston, D. (49%), **Ortega, F.** (1%), and Ray, Indrakshi (1%). Disclosure: 12/5/2018. Submitted: 5/7/2019. Title: HomeFlow: Using Dynamic Visualization of Home IoT Traffic to Intuitively Understand and Defend Home Networks.

SECTION 3: Evidence of Teaching and Advising Effectiveness

TEACHING

Curriculum Development

Dr. Ortega created a complete set of courses for the Human-Centered Computing certificate. This includes CS 310H (mixed-reality design), CS 465 (Multimodal Interaction), the overhaul of CS 464 (introduction to HCI, which already existed), and the graduate course CS 567 (3D user interfaces). In addition, he participated in the co-development of CS-464 (virtual worlds).

4. CS-465. Developed in 2024 (and approved) to start Spring 2025. This course goes into depth about input devices and interaction techniques for Extended Reality including unimodal and multimodal interaction. This is a capstone course.

3. CS-310H, updated in Fall 2022, uses Unreal Game Engine 5. Between the classes and the lab sessions, students from Computer Science and other majors (cross-listed courses) learn how to develop a virtual reality environment. In addition, students learned design concepts and augmented and virtual reality theory. Dr. Ortega has also obtained more than 60 headsets to give to the students.

2. CS-464 was changed completely by Dr. Ortega from a usability course to a human-computer interaction with vital scientific concepts in experiment design and HCI concepts. Students develop a final capstone project in this class.

1. CS-567 is a very advanced research class where students develop augmented and virtual reality projects and understand the most cutting-edge concepts. This course is updated everything while maintaining key concepts.

Dr. Ortega is expected to introduce an additional course as part of his NSF CAREER.

Proposed Courses

Proposed: **Fall 2018**	**CS 567**	3D User Interfaces
Status: Approved	4 credits	Graduate
Proposed: **Fall 2019**	**CS 310H/IDEA 310H**	Mixed Reality Design
Status: Approved	3 credits	Undergraduate
co-Proposed: **Spring 2021**	**CS 462**	Virtual Worlds
Status: Approved	3 credits	Undergraduate
Proposed: **Spring 2024**	**CS 465**	Multimodal Interaction
Status: Approved	4 credits	Undergraduate Capstone

Courses: Colorado State University

NOTE: CS 567 or other courses may appear below another class because when it is not offered. The reason is that a student may be allowed to take it with the professor's permission. If this is the case, the student watches the video from a previous semester. This is available to selected students that may benefit from the material for their research given the class is offered once

every other year. The enrollment numbers are based on the final numbers after students have dropped.

Fall 2025	**CS462** 4 Credits	Engaging in Virtual Worlds Enrollment: 91 in class and 29 online (801)).
Summer 2025	**CT 301** 2 Credits	Principles of Human-Computer Interaction Enrollment: 60 (401) and 14 online (801)).
Spring 2025	****NEW COURSE**** **CS 465** 4 Credits	Multimodal Interaction for 3D User Interfaces Enrollment: 60 in class and 17 online (801)). Undergraduate Capstone
Fall 2024	**CS/IDEA 310H** 3 Credits Student(s)	Mixed-Reality Design Enrollment: 61 in class 7 online CS+IDEA: 64+20; CS/IDEA (online):13+5 *CS 465 as 495* Multimodal Interaction (Restricted Access) 4 Credits. Enrollment: 2 (No class lectures)
Spring 2024	**CS 464** 4 Credits	Principles of Human-Computer Interaction Enrollment: 79 in class and 14 online (801)). Undergraduate Capstone
Fall 2023	**CS 567** 4 Credits	3D User Interfaces Enrollment: 27 (in-class) and 13 (online) – Graduate Course
Spring 2023	**CS 464** 4 Credits	Principles of Human-Computer Interaction Enrollment: 69 in class, 17 online (801), and one online (802). Undergraduate Capstone
Fall 2022	**CS/IDEA 310H** 3 Credits Student(s)	Mixed-Reality Design Enrollment: 61 in class 7 online CS/IDEA: 47+13; CS/IDEA (online):6+1
Spring 2022	**CS 464** 4 Credits	Principles of Human-Computer Interaction Enrollment: 62 in class and 17 online, COVID restrictions. Undergraduate Capstone *CS 567* 3D User Interfaces (Restricted Access) 4 Credits. Enrollment: 1 (No class lectures)
Fall 2021	**CS 567** 4 Credits	3D User Interfaces Enrollment: 18 (in-class) and 3 (online), COVID restrictions – Graduate Course
Spring 2021	**CS 464** 4 Credits	Principles of Human-Computer Interaction Enrollment: 41 in class and 13 online, COVID restrictions. Undergraduate Capstone
Fall 2020	**CS/IDEA 310H** 3 Credits Student(s)	Mixed-Reality Design Enrollment: 26 (Hybrid, COVID restrictions) CS+IDEA: 12+9; CS+IDEA (online):4+1

		CS 567 3D User Interfaces (Restricted Access) 4 Credits. Enrollment: 2 (No class lectures)
Spring 2020	**CS 464** 4 Credits	Principles of Human-Computer Interaction Enrollment: 65 – Undergraduate Capstone
Fall 2019	**CS 567** 4 Credits	3D User Interfaces Enrollment: 15 (in-class) and 7 (online) – Graduate Course
Spring 2019	**CS 464** 4 Credits	Principles of Human-Computer Interaction Enrollment: 46 – Undergraduate Capstone
Fall 2018	**CS 457** 4 Credits	Computer Networks and the Internet Enrollment: 56 (in-class) and 4 (online) – Undergraduate Elective

Additional Graduate and Undergraduate Directed Research Courses: Colorado State University

CS 295	Fall (2018)	Total enrollment: 1 student
CS 495	Fall (2021)	Total enrollment: 1 students
CS 498	Fall (2019–2022); Spring (2019, 2020, 2022 – 2024); Summer (2019, 2021)	Total enrollment: 11 students
CS 695	Fall (2020, 2023, 2024, 2025); Spring (2021, 2024)	Total enrollment: 6 students
CS 699	Fall (2019–2025); Spring (2020–2025)	Total enrollment: 20 students
CS 793	Fall (2018–2023, 2025); Spring (2019–2024)	Total enrollment: 28 students
CS 799	Fall (2019–2025); Summer (2025); Spring (2020–2025)	Total enrollment: 69 students

Guest Lecturer (Courses): Colorado State University

Spring 2024	**CS 501** 1 Credit Student(s)	Graduate Seminar Enrollment: Guest instructor: 3 weeks NUILAB
Spring 2023	**CS 501** 1 Credit Student(s)	Graduate Seminar Enrollment: 67 Guest instructor: 3 weeks NUILAB
Fall 2021	**CS 692** 1 Credit Student(s)	Graduate Seminar Enrollment: 45 Guest instructor: 3 weeks NUILAB
Fall 2020	**CS 692** 1 Credit Student(s)	Graduate Seminar Enrollment: 39 Guest instructor: 3 weeks NUILAB.
Fall 2020	**CS 692** 1 Credit Student(s)	Graduate Seminar Enrollment: 39 Guest instructor: 1 week with CWC (out of 3)

Courses: Florida International University

- **Supervised Research Instructor.** CIS 5910: Summer 2018 (one student), Spring 2018 (three students), Fall 2018 (one student), Summer 2017 (three students).

- **Instructor.** CNT 4713 – Net-Centric Computing: Summer 2018 (online), Spring 2018 (three sections, one of them online), Spring 2017 (two sections).
- **Instructor.** COP 4005 – Windows Programming for IT: Spring 2018 (online).
- **Instructor.** IDS 3917 (Junior), IDS 4818 (Senior) – Vertically Integrated Projects (Capstone): Spring 2018, Fall 2017, Summer 2017, Spring 2017, Fall 2016.
- **Instructor.** IDS 2917 (Sophomore) - Vertically Integrated Projects: Spring 2018.
- **Instructor.** COP 4610 – Operating System Principles: Fall 2017, Fall 2016 (two sections).
- **Instructor.** COP 5725 – Principles of RDBMS (graduate): Fall 2017, Spring 2016 (co-instructor).
- **Instructor.** COP 4338 – Programming III (C language): Summer 2017, Summer 2016, Summer 2015 (C/C++), Spring 2015
- **Instructor.** COP 3337 – Programming II (Java): Summer 2017.
- **Instructor.** IDS 5993 - Vertically Integrated Projects Graduate: Spring 2017.
- **Instructor.** ECE 6803 – Advanced Digital Forensics (graduate): Spring 2017 (FEEDS online only), Spring 2016, Spring 2015.
- **Instructor.** ECE 4802 – Digital Forensics: Spring 2017 (FEEDS online and class), Spring 2016, Spring 2015.
- **Instructor.** COP 4610 – Operating System Principles (two sections): Fall 2016.
- **Instructor.** CNT 5416 – Practical Applied Security (graduate): Fall 2016.
- **Instructor.** TCN-6430 – Network Management and Control Standards (graduate). Fall 2016.
- **Instructor.** COP 4813 – Web Application Programming: Fall 2015 (ASP.NET C#), Spring 2016 (node.js).
- **Instructor.** ECE 6803 – Advanced Digital Forensics (graduate – fully online): Summer 2017,Summer 2016, Summer 2015.
- **Instructor.** EEL 5807 – Advanced Ethical Hacking (graduate): Summer 2016, Summer 2015.
- **Instructor.** CGS 4854 – Website Management and Construction: Summer 2012 (Java).
- **Teaching Assistant.** COP 2210L – Programming I (Java): Spring 2012, Fall 2011, Summer 2011, Spring 2011, Fall 2010, Summer 2010.
- **Teaching Assistant.** CGS 2060L – Introduction to Microcomputers: Spring 2010.
- **Teaching Assistant.** CAP 5602 – Introduction to Artificial Intelligence: Spring 2009.

TEACHING AREAS

Beyond Dr. Ortega's areas of expertise, he is prepared to teach the majority of Computer Science Courses at an undergraduate and graduate level, including Human-Computer Interaction, 3D User Interfaces, Virtual and Augmented Reality, Operating Systems, Databases, Programming, Data Structures, Fundamentals, Networking, Cyber-Security, Software Engineering, and Capstone projects, among others.

STUDENT and POST-DOCTORAL ADVISING (SUMMARY)

Post-Doctoral Summary – CSU

- Former Post-Doctoral January 2022 – December 2023 (2 years):
  - ◇ Dr. Adam Sinclair Coler (maiden Williams). DARPA Post-Doctoral Fellow.
  - ◇ Total: 1
- Current Graduate Advisees (as of December, 2025):
  - ◇ Vidya Gaddy (Ph.D.), Richi Rodriguez (Ph.D.), Jieqiong (Jacinda) Li (Ph.D.), Brendan Kelley (Ph.D.), Lena Hinzer (Ph.D.), Rachel Masters (Ph.D.), Asif Asif Uz Zaman (Ph.D.)
  - ◇ Current Students During 2024 (Total): 7 Ph.D. students
- Current Graduate Committee Memberships (excluding those chaired):
  - ◇ Computer Science: Septia Rani (Ph.D.), S M Rashidul Hasan Nijhum (Ph.D.), Sadaf Ghaffari (Ph.D.), Malek Mechergui (Ph.D.), Ethan Myers (Ph.D.).
  - ◇ Outside Member: Daniel Quiceno Cuartas (Ph.D.), Haley McCoy (Ph.D.), Rebecca Pharmer (Ph.D.), Amanda Spitzer (Ph.D.), Janaki Subramani (M.S.), Prashant Rawat (Ph.D.), John Phillips (Ph.D.).
  - ◇ Total: 5 + 7 = 12.
- Former Ph.D. students
  - ★ Dr. Zahra Faeze Borhani. Defended Fall 2025.
  - ★ Dr. Lucas Plabst. Defended Summer 2025. Now XR Researcher at MeasuringU (Denver, Co.).
  - ★ Dr. Aditya Raikwar. Defended Summer 2024. Now Post-Doctoral Fellow at the University of Delaware.
  - ★ Dr. Xiaoyan Zhou. Defended Summer 2024. Now Post-Doctoral Fellow at KTH Royal Institute of Technology, Stockholm, Sweden.
  - ★ Dr. Adam S. Williams. Defended Fall 2021. Former DARPA Post-Doctoral Fellow, now at LinkedIn.
  - ★ Total: 5
- Former Master with Thesis Advisees

- ◇ Caspian Siebert. Fall 2024.
- ◇ Ethan Holen. Now, HP Cloud Kubernetes Platform Engineer. Summer 2024.
- ◇ Dan Rehberg. Now, Assistant Professor of Practice at University of Notre Dame. Summer 2024.
- ◇ Brian Sullivan. Summer 2023.
- ◇ Domenick Mifsud. Now, Ph.D. at Gerogia Tech. Spring 2023.
- ◇ Adam Williams, concurrent with Ph.D. Spring 2021.
- ◇ Vidya Gaddy. Now Ph.D. student at CSU. Summer 2021.
- ◇ Aditya Raikwar. Now Ph.D. student at CSU. Summer 2020.
- ◇ Zahra Faeze Borhani. Now Ph.D. student at CSU. Summer 2020.
- ◇ Heting (Jane) Wang (M.S. Thesis) co-advised with Ross Beveridge. Now Ph.D. student at University of Florida.
- ◇ Rahul Bangar (M.S. Thesis) co-advised with Ross Beveridge.
- ◇ Total: 11

- Former Masters with Project Option
  - ◇ Swagata Aich, Fall 2025.
  - ◇ Total: 1

- Former Graduate Committee Memberships (excluding those chaired):
  - ◇ Computer Science: Manafi Avari Shadi (Ph.D.), Nada Alalyani (Ph.D.), Shadi Manafi Avari (Ph.D.), Ethan Meyes (M.S.), Kiley Kroski (M.S.), Emily Tucker (M.S.), Dhatri Padakanti (M.S.), Chirag Kandoi (M.S.), Muhammad AlSharif (Ph.D.) *removed 2023*, Nicolas Derumign (Ph.D.), Dhruva Patil (Ph.D.), William Pickard (Ph.D.) *removed 2022*, Paras Qadir Memon (Ph.D.) *removed 2021*, Sachini Weerawardhana (Ph.D.), Zhisheng Xu (Ph.D.), Mathew Dragan (M.S.), Joseph Strout (M.S.), Rusha Lawande (M.S.), Michael Boyle (M.S), Jason Xu (Ph.D.), Shadi Manafi Avari (Ph.D.), Saptashwa Mitra (Ph.D.), Nada Alalyani (Ph.D.),
  - ◇ Outside: Rahul Chaudhari (Ph.D.), Timi Olurotimi Oguntola (Ph.D)., Bontha Jaya Surya (M.S.), Haley McCoy (M.S.), Emmanuel Cao (Ph.D) *removed 11/18/20205*, Brandon Perry (Ph.D.), Colleen Patton (Ph.D.), Pantea Habibi (Ph.D.), Michael Creutzinger (Ph.D.), Nathan Herdener (Ph.D.), Lauren Mangus. (M.A.), Brendan Kelley (M.S.), Colleen Patton (M.S.), Shiyang Wu (M.S.), Carl Thompson (Ph.D.) *removed 2023*.
  - ◇ Total: 23 + 15 = 40.

- Former Research Intern Advisees:
  - ◇ Lucas Plabst, Ph.D. student (Germany, University of Wuerzburg). 2022.
  - ◇ Lena Hinzer, M.S. student (Germany, University of Wuerzburg). 2022.

- ◇ Logan Loi (Georgia (US), Georgia Tech), Summer 2020.
- ◇ Erwan La Pluard (France, ENIB – Brest National School of Engineering), Spring 2020.
- ◇ Auguste Cousin (France, ENIB – Brest National School of Engineering), Spring 2020.
- ◇ Lucas Plabst (Germany, University of Wuerzburg). Fall 2019.
- ◇ Prashast Sharma (India). Summer 2019.
- ◇ Eric Ridd (Florida (US), New College of Florida). Summer 2019.
- ◇ Total: 8. (3 in 2019, 3 in 2020, 2 in 2022.).

STUDENT ADVISING (CSU)

Ph.D. Directed Research

Σ.1 Vidya Gaddy, Ph.D. student. Computer Science, CSU. Fall 2021 – Present. Completed M.S. at CSU. Status: All courses completed. Ph.D. Proposal date TBD. Expected to graduate in 2026.

Σ.2 Richi Rodriguez, Ph.D. student. Computer Science, CSU. Spring 2020 – Present. Completed M.S. at FIU. Research Exam Completed Spring 2022. Proposal expected Summer 2023 or before.

Σ.3 Jieqiong (Jacinda) Li, Ph.D. Computer Science, CSU. Spring 2022 – Present. Completed M.S. at CSU. Research Exam Expected Summer 2023.

Σ.4 Brendan Kelley, Ph.D. Computer Science, CSU. Fall 2022 – Present. Completed M.S. at CSU (in Communication). Expected to graduate Spring/Summer 2025.

Σ.5 Lena Plabst (maiden Hinder), Ph.D. Computer Science, CSU. Fall 2023 – Present. Completing M.S. at the University of Wurzburg (in Human-Computer Interaction). Proposal Expected Summer 2026.

Σ.6 Rachel Masters, Ph.D. Computer Science, CSU. Fall 2023 – Present. NSF GRFP Awardee. Former undergraduate in Computer Science at CSU. Completed Master degree. Expected to defend 2025 or 2026.

Σ.7 Asif Asif Uz Zaman, Ph.D. Computer Science, CSU. Fall 2024 – Present. Expected proposal Spring 2026.

Master Thesis Directed Research

Σ.9 Maxi Rose, M.S. candidate. Computer Science, CSU. Spring 2025 – Present.

Σ.10 Matthew Buckman, M.S. candidate. Computer Science, CSU. Fall 2025 – Present.

Computer Science Committee Member

E.1 Septia Rani. Ph.D. student. Computer Science, CSU. Advisor: Sarath Sreedharan.

E.2 S M Rashidul Hasan Nijhum, Ph.D. student. Computer Science, CSU. Advisor: McKenna McCall.

E.3 Sadaf Ghaffari. Ph.D. student. CSU.

E.4 Ethan Myers, Ph.D.. student. CSU. Advisors: Nathaniel Blanchard and Mohammed Arefin.

E.5 Malek Mechergui, Ph.D. student. CSU. Advisor: Sarath Shreedharan.

Outside Committee Member

E.7 Daniel Quiceno Cuartas , Ph.D. student. Psychology, CSU. Advisor: Anne Cleary.

E.8 Haley McCoy, Ph.D. student. Psychology, CSU. Advisor: Matt Rhodes.

E.9 Rebecca Pharmer. Ph.D. student. Psychology, CSU. Advisor: Matt Rhodes.

E.10 Amanda Spitzer. Ph.D. student.Psychology, CSU. Advisor: Dan Graham.

E.11 Prashant Rawat. Ph.D. student. Computer Science, Dalhousie University. Advisor: Mayra Donaji Barrera Machuca.

E.12 John Phillips. Ph.D. student. Systems Engineering, CSU. Advisor: Erika E. Miller. Current status is unknown.

E.13 Subramani Janaki, M.S. student. Computer Engineering, CSU. Advisor: Sudeep Pasricha.

E.14 Janaki Subramani. M.S. Student. Computer Engineering, CSU.

Ph.D. Students (Former)

F.1 Zahra Faeze Borhani, Ph.D. student. Computer Science, CSU. Fall 2020 – Fall 2025. Completed M.S. at CSU.

F.2 Lucas Plabst, Ph.D. Computer Science, CSU. Fall 2023 – Summer 2025. Completed M.S. at the University of Wurzburg (in Human-Computer Interaction). Now XR Researcher at MeasuringU (Denver, CO.).

F.3 Aditya Raikwar, Ph.D. student. Computer Science, CSU. Fall 2020 – Summer 2024. Now Post Doctoral Fellow at the University of Delaware.

F.4 Xiaoyan Zhou, Ph.D. student. Computer Science, CSU. Fall 2020 – Summer 2024. Now Post Doctoral Fellow at KTH Royal Institute of Technology.

F.5 Adam S. Williams. Ph.D. Computer Science, CSU. Fall 2018 – Fall 2021. Former DARPA Post Doctoral Fellow, now at Linkedin.

Master Thesis Directed Research (Former)

F.4 Master Rachel, M.S. in Computer Science, CSU. Fall 2023 – Fall 2024.

F.5 Caspian Siebert , M.S in Computer Science, CSU. Fall 2023 – Fall 2024.

F.6 Ethan Holen, M.S in Computer Science, CSU. Fall 2022 – Summer 2024.

F.7 Dan Rehberg, M.S in Computer Science, CSU. Fall 2022 – Summer 2024.

F.8 Brian Sullivan, M.S. in Computer Science, CSU. Fall 2020 – Spring 2023.

F.9 Domenick Mifsud, M.S. in Computer Science, CSU. Fall 2020 – Spring 2023. Currently Ph.D. in Georgia Tech in BCI with NIH T32 Fellowship in the Biomedical Engineering Program.

F.10 Adam Williams. M.S. in Computer Science, CSU. Fall 2018 – Spring 2021. Concurrent with Ph.D. Now, DARPA Postdoc.

F.11 Vidya Gaddy. M.S. in Computer Science, CSU. Fall 2019 – Summer 2021. Now Ph.D. student at CSU and CSU instructor.

F.12 Aditya Raikwar. M.S. in Computer Science, CSU. Fall 2018 – Summer 2020. Now Ph.D. student at CSU

F.13 Zahra Faeze Borhani. M.S. in Computer Science, CSU. Spring 2019 – Summer 2020. Now Ph.D. student at CSU.

F.14 Heting (Jane) Wang. M.S. in Computer Science. Co-advised with J. Ross Beveridge. Fall 2018 – Summer 2020. Now a Ph.D. student at the University of Florida.

F.15 Rahul Bangar. M.S. in Computer Science. Co-advised with Ross Beveridge. Fall 2018 – Spring 2021.

Master Research Initiation or Projection Option Directed Research – *No Thesis* (Former)

F.14 Tanmay Prabhu Naidu , M.S. Project Option Computer Science, CSU. Fall 2023 – Summer 2024.

F.15 Jieqiong (Jacinda) Li. M.S. Computer Science, CSU. Spring 2020 – Fall 2021. Now a Ph.D. student at CSU (Research Initiation Track).

CS Committee Member (Former)

ϕ.1 Manafi Avari Shadi, Ph.D. student. CSU. Advisor: Nikhil Krishnaswamy. Graduated Fall 2024.

ϕ.2 Nada Alalyani. Ph.D. student. CSU. Advisor: Nikhil Krishnaswamy. Graduated Summer 2024.

ϕ.3 Shadi Manafi Avari, Ph.D. student, CSU. Advisor: Nihhil Krishnaswamy. Graduated Summer 2024.

ϕ.4 Saptashwa Mitra, Ph.D. student. CSU. Advisor: Sangmi Pallickara. Graduated Fall 2023.

ϕ.5 William Pickard. Ph.D. student. Computer Science, CSU. Advisor: Nate Blanchard. Fall 2020 – Fall 2022. *removed 2022.*

ϕ.6 Sachini Weerawardhana, Ph.D. student. Computer Science, CSU. Advisors: Indrajit Ray and Darrel Whitley. Fall 2020 – Fall 2021. Graduated Fall 2021.

ϕ.7 Muhammad AlSharif, Ph.D. student. CSU. Advisor: Chuck Anderson. *removed 2023.*

ϕ.8 Nicolas Derumign. Ph.D. student. CSU. Advisor: Louis-noel Pouchet. Graduated December 2023.

ϕ.9 Dhruva Patil. Ph.D. student. Computer Science, CSU. Advisor: J. Ross Beveridge. Fall 2019 – Spring 2022. Graduated Spring 2022.

ϕ.10 Paras Qadir Memon, Ph.D. student. Computer Science, CSU. Advisor: Chuck Anderson. Spring 2019 – Fall 2021. Removed 11/10/2022.

ϕ.11 Zhisheng Xu. Ph.D. student. Computer Science, CSU. Advisor: Ross McConnell. Graduated. Fall 2021.

ϕ.12 Ethan Myers, M.S. student. Computer Science, CSU. Advisor: Nathaniel Blanchard.

ϕ.13 Kiley Krosky, M.S. student. Computer Science, CSU. Advisor: Indrakshi Ray. Graduated Spring 2025.

ϕ.14 Emily Tucker, M.S. student. Computer Science, CSU. Advisor: Louis-Noel Pouchet. Graduated Spring 2025.

ϕ.15 Dhatri Padakanti. M.S. student. Computer Science, CSU. Advisor: Sudipto Ghosh. Graduated. Spring 2024.

ϕ.16 Chirag Kandoi. M.S. student. CSU. Advisor: Nathaniel Blanchard. Graduated. Summer 2023.

ϕ.17 Mathew Dragan, M.S. student, Computer Science, CSU. Advisor: J. Ross Beveridge. Spring 2019 – Summer 2020. Graduated Summer 2020.

ϕ.18 Joseph Strout, M.S. student, Computer Science, CSU. Advisor: J. Ross Beveridge. Fall 2019 – Summer 2020. Graduated Summer 2020.

ϕ.19 Rusha Lawande. M.S. student. Computer Science, CSU. Advisor: Nate Blanchard. Graduated Fall 2021.

ϕ.20 Michael Boyle. M.S. student, CSU. Advisor: Nathaniel Blanchard. Graduated Spring 2022.

ϕ.21 Jason Xu. Ph.D. student. Advisor: Ross McConnell. Graduated Summer 2022.

Outside Committee Member (Former)

ϕ.15 Rahul Chaudhari, Ph.D. student. Civil and Environmental Engineering, CSU. Graduated Fall Semester 2025.

ϕ.16 Jaya Surya Bontha, M.S. student. Computer Engineering, CSU. Graduated Fall Semester 2025.

ϕ.17 Timi Olurotimi Oguntola, Ph.D. student. Systems Engineering, CSU. Advisor: Steve Simske. Graduated Summer 2025.

ϕ.18 Emmanuel Cao. Ph.D. student. Systems Engineering, CSU. Advisor: James Cale. Removed 11/18/2025.

ϕ.19 Michael Creutzinger, Ph.D. student. Statistics, CSU. Advisor: Julia Sharp. Graduated Fall 2024.

ϕ.20 Pantea Habibi. Ph.D. student. University of Illinois Chicago. Advisor: Debaleena Chattopadhyay. Graduated Summer 2024.

ϕ.21 Brandon Perry. Ph.D. Civil and Environmental Engineering, CSU. Advisor: Yanlin Guo. Graduated Fall 2023.

ϕ.22 Michael Creutzinger. Ph.D. Statistics, CSU. Advisor: Julia Sharp. Graduated Summer 2024.

ϕ.23 Nathan Herdener. Ph.D. Psychology, CSU. Advisor: Ben Clegg. ABD student. *inactive 2023*.

ϕ.24 Colleen Patton. Ph.D. student. Psychology, CSU. Advisor: Ben Clegg. Graduated 2023.

ϕ.25 Haley McCoy, M.S. student. Psychology, CSU. Advisor: Matt Rhodes. Graduated Summer 2025.

ϕ.26 Lauren Mangus. M.A. student. English, CSU. Advisor: Tatiana Nekrasova-Becker. Graduated 2023.

ϕ.27 Brendan Kelley. M.S. student. Journalism and Media Comm, CSU. Advisor: Michael Humphrey. Graduated Summer 2022.

ϕ.28 Colleen Patton. M.S. student. Psychology, CSU. Advisor: Ben Clegg. Graduated Spring 2021.

ϕ.29 Shiyang Wu, M.S. student, ECE. Advisor: J. Ross Beverdige. Fall 2019 – Spring 2019. Graduated.

ϕ.30 Carl Thompson. Ph.D. student. Systems Engineering, CSU. Advisor: Steve Simske. *removed 2023*.

Directed Undergraduate Research

μ.1 Alessia Gamebera. Computer Science (B.S.) CSU. Fall 2025 – present.

μ.2 Courtney La Croix. Computer Science (B.S.) CSU. Fall 2025 – present.

μ.3 Julliete Dashe. Computer Science (B.S.) CSU. Spring 2025 – present.

μ.4 Camille Harmon. Computer Science (B.S.) CSU. Spring 2025 – present.

Former Directed Undergraduate Research (CSU)

Ψ.1 Regan Williams. Computer Science (B.S.) CSU. Fall 2023 – Fall 2025. Now a master's student.

Ψ.2 Ali Branum. Computer Science (B.S.). CSU. Spring 2024 – Spring 2025.

Ψ.3 Matthew Buckman. Computer Science (B.S.). CSU. Fall 2022 — Spring 2025. Now a master's student.

Ψ.4 Dylan Schreiber. Computer Science (B.S.). CSU. Fall 2022 — Spring 2025. Now at a large government contractor.

Ψ.5 Emily Cosgrff. Computer Science (B.S.) CSU. Spring 2023 – Spring 2024.

Ψ.6 Irene Zaugg. Computer Science (B.S.). CSU. 2024.

Ψ.7 Jessica Li. Data Science (B.S.). CSU. 2024.

Ψ.8 Ethan Smith. Computer Science (B.S.). CSU. 2024.

Ψ.9 Mason Coco. Computer Science (B.S.). CSU. Spring 2023 – Fall 2024. (Co-advised with Dr. Indrakshi Ray).

Ψ.10 Phat Ho. Computer Science (B.S.). CSU. Fall 2023 – Fall 2024. Graduated.

Ψ.11 Jeremiah Geisterfer. Computer Science (B.S.). CSU. Fall 2022 – SPRING 2023. Graduated.

Ψ.12 Jacob Masters. Computer Science (B.S.). CSU. Fall 2022 – SPRING 2024.

Ψ.13 Jalynn Nicoly. Computer Science (B.S.). CSU. Summer 2022 - SPRING 2024. Now, a Ph.D. student at the University of Colorado, Boulder.

Ψ.14 Ryan Blocker. Computer Science (B.S.). CSU. Fall 2021 – Fall 2024. Graduated.

Ψ.15 Andrew Lyon. Computer Science (B.S.). CSU. Summer 2021 – Spring 2023. Graduated.

Ψ.16 Rachel Masters. Computer Science (B.S.). CSU. Spring 2021 – Spring 2023. Now, a Ph.D. student at CSU.

Ψ.17 Ethan Holen. Computer Science (B.S.). CSU. Spring 2020 – Summer 2022. M.S. Student at CSU.

Ψ.18 Alex Karduna. Computer Science (B.S.). CSU. Fall 2019 – Fall 2021. M.S. student at CSU.

Ψ.19 Amy Felix. Computer Science (B.S.). CSU. Fall 2020 – Fall 2021.

Ψ.20 Dan Rehberg. Computer Science (B.S.). CSU. Spring 2021 – Summer 2022. Now M.S. student at CSU.

Ψ.21 Madeline Watts. Computer Science (B.S.). CSU. Fall 2020 – Spring 2022.

Ψ.22 Ethan Ganster. Computer Science (B.S.). CSU. Spring 2021 – Fall 2021.

Ψ.23 Crispin Haro. Computer Science (B.S.). CSU. Fall 2020 – Summer 2021.

Ψ.24 Arysa Flores. Computer Science (B.S.). CSU. Fall 2020 – Spring 2021.

Ψ.25 Dominique Misfud. Computer Science (B.S.). CSU. Spring 2019 – Spring 2020. Earned M.S. student at CSU.

Ψ.26 Kellyn Dassler. Computer Science (B.S.). CSU. Fall 2018 – Spring 2020.

Ψ.27 Ariana Mims. Computer Science (B.S.). CSU. Fall 2018 – Spring 2019. Now with Dr. Indrakshi Ray, IOT lab. Now a CSU instructor.

Former Directed High-School Interns (CSU)

The names are not in the summary because they were minors when they were summer interns.

- Summer 2019: 3 High-School students (3 males).
- Summer 2020: 1 High-School student (female).

Professional Workshops and Training

- fNIRS Nirx Sports Training. Summer 2025. Received training on how to use fNIRS equipment and combine it with EEG.
- NSF NRT Workshop. September 18, 2020. Provided information about the NSF graduate grants available.
- CAHSI. Building CISE Research Capacity at Hispanic-Serving Institutions Workshop. July 9–10, 2019. Travel award received.
- CMD-IT Academic Career Workshop, May 16–18, 2019. Travel award received.
- NSF Career Workshop at National Science Foundation. April 8–9, 2019.
- Colorado State University, Search Committee Search Training. February 11, 2019.
- NSF Career Preparation at Colorado State University (multiple meetings). Spring 2019.
- NSF Proposal Writing. Grant Training Center. Online. January 2019.
- NSF Computer Science New Faculty Workshop (Tenure-Track Session). UCSD. Aug. 5 to Aug. 7. 2018. Hotel and meals award received.
- Several teaching study (book) groups at FIU. This included *Effective Instruction for STEM Disciplines* and *Make it Stick*, among others. 2015-2017.

Description of Mentoring Activities (CSU)

Dr. Ortega holds weekly meetings with all of the students at CSU that are doing research under his supervision. He also has one-to-one meetings with Ph.D. students every other week or as needed. He meets with M.S. students and undergraduate students as needed. In addition, Dr. Ortega holds the CS 793 in Human-Computer Interaction. The CS 793 meetings are held weekly. Activities during the meetings include paper presentations, project presentations, guidance about research, and planning, among others. Finally, whenever requested, he offers independently supervised research credits for undergraduate students.

Teaching Improvements (CSU)

After the NSF Workshop on teaching for new faculty that Dr. Ortega attended in August 2018, he implemented new methodologies in the classroom. First, Dr. Ortega started using the iClicker to ask questions before providing the answer (or even at times) the actual information students need to answer. This has been shown to provide an improved recall of concepts for students even when they don't get the correct answer. In addition, Dr. Ortega created a series of activities (including the iClicker) that were designed to improve learning. This includes online quizzes (with multiple retries), and hands-on labs, among others. Dr. Ortega called these activities because they are meant not as a way to evaluate the students but to instead accelerate student engagement. The students are in turn graded for participation after completing these activities. The participation grade is common in some classes and requires the student to complete the activities. In the Spring of 2019, Dr. Ortega added mini-surveys to understand which concepts the students may find more difficult to understand. In the Fall 2020, he removed the mini-surveys because they did not work with the layout of his course.

With the experience gathered until Spring 2020, including the new COVID-19 reality, Dr. Ortega started to consider adding new techniques to his style and methods of teaching. CS 310H is a hybrid course, and in the Spring of 2021, will be a brand-new CS 464 human-computer interaction designed course that uses a unified framework to teach (while keeping the theory in place). This is in response to feedback and experience gained over the years of teaching the materials presented in the course. While a few students do great with the option to implement in any language they want, the majority face a bigger challenge.
Dr. Ortega offered CS 310H / IDEA 310H, a cross-listed course. This course included hands-on labs to develop virtual reality using Unreal Game Engine 5, as well as augmented and virtual reality concepts in the classroom.
Dr. Ortega has developed a series of materials and quizzes for CS 464. During spring 2023, Dr. Ortega will add more qualitative concepts since CS 464 has been heavily quantitative. The reason for Dr. Ortega to adapt his classes every year is to provide the most useful information to students that will be useful for industry and graduate school.
As of 2022, Dr. Ortega has improved all his classes. For example, Dr. Ortega integrated non-cs students with CS students in CS 310H/IDEA310H. Using a common starting point, Dr. Ortega has been able to teach concepts that satisfy students without coding experience while advancing existing CS knowledge to both groups of students. Another example is that Dr. Ortega uses most of his classes in a research and discovery approach. This means that the classes, besides basic knowledge about a topic, promote research for the students using their extensive knowledge of human-computer interaction (HCI). For example, in CS 464, students have to complete a

research project selected by them with very similar standards to an HCI conference. Finally, Dr. Ortega, in CS 464, allows students to complete a prototype that could be used to continue research after the class is over or showcase it for jobs. This is equivalent to a "senior" year project in other universities. This is a capstone class.

CSU's ARVR Student Club

Dr. Ortega co-facilitates the ARVR Club where students of similar interests get together once a week to discuss topics, plan projects, and listen to presentations by them or other guests. Students from the club attended CSU's VR Hackathon (sponsored by the office of the vice president of research). This included Ariana Mims, who won first place. The ARVR Club started in the Fall 2018 and it is still active. It has had some challenges during COVID but it continues to be active. Sadly, due to lack of interest, the ARVR Club ended its organization as Summer 2024.

CSU's Colorstack Chapter

Dr. Ortega is the faculty advisor for the CSU Colorstack chapter and has helped students to create and support it since Fall 2024.

CSU's VR Hackathon

Dr. Ortega is part of CSU's VR Hackathon committee and CSU's XR Symposium. During 2019, many of the students were recruited by Dr. Ortega and people invited to symposiums from outside Fort Collins came at his invitation. A group in Dr. Ortega's lab won the first prize. After COVID-19, the event was held again in 2022. The event had two teams that included Dr. Ortega's lab members. Dr. Ortega also held a session to help students understand the event and how to be successful.

Dr. Ortega also participated as a judge during the 2018 session. This platform, led by the vice president of research, allows students to come together and work on exciting projects. Some of these projects lead to research by CSU's faculty. During the 2018 session, Dr. Ortega invited 9 students from Florida International University to improve diversity and promote CSU. Students from AR/VR club also attended. He also recruited 8 students from his CS 457 course. Dr. Ortega's undergraduate research student Ariana Mims won first place in 2018. Most of the students Dr. Ortega recruited received awards including first, second, and third, and some smaller awards. This activity provides the ability to promote teaching and research during a 3-day event.

CSU's MST Day

Dr. Ortega's research lab continues to participate in the Math and Science Technology Day to promote Virtual Reality among 6th to 8th graders (October 3rd, 2019 and October 11th, 2018). This has been a great opportunity to promote STEM education to under-represented minorities.

CSU's Incoming Students Tour and CS activities

Dr. Ortega's research lab has always been present for the Computer Science department activities starting from Fall 2018. Dr. Ortega still provides his lab for tours for multiple events

including CSU students, prospective students, guests, and K-12 students in the area.

Ph.D. Student Refereed Doctoral Consortium

★ Borhani, Z. (2022, March). [DC] Annotation in Asynchronous Collaborative Immersive Analytic Environments using Augmented Reality. In 2022 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW) (pp. 950-951). IEEE. https://ieeexplore.ieee.org/abstract/document/9757653. 2022.

★ Willams, A.[†], and **Ortega, F**. Multimodal User-Defined inputs for Optical See Through Augmented Reality Environments. In *2020 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW)*, Atlanta, GA, USA, 2020, pp. 557-558, https://doi:10.1109/VRW50115.2020.00130. **[CC: 1]**. 2020.

STUDENT ADVISING (FIU)

Former Directed Master Research – non-Thesis (FIU)

Φ.1 Fernando De Zayas, M.S., Computer Science, Fall 2017 – Fall 2019.

Φ.2 Mathew Kress. Computer Engineering (M.S.). FIU. Fall 2016 – Fall 2018. Now at HELM Systems (creators of SoulKeeper VR).

Φ.3 Jules Calella. Electrical Engineering (M.S.). FIU. Fall 2016 – Spring 2018. Now at Microsoft Embedded. First Job: BioMagic VR as Embedded Engineer.

Φ.4 Ruben Balcazar. Computer Science (M.S.). FIU. Summer 2015 – Fall 2017. First job: Ultimate Software as Software Developer.

Former Directed Undergraduate Research (FIU)

Ψ.5 Fidel Hernandez. Computer Science (B.S.). FIU. Summer 2018 – Spring 2020.

Ψ.6 Catherine Angelini. Computer Science (B.S.). FIU. Spring 2018– Spring 2019. Now with Microsoft (recurring Internship).

Ψ.7 Diana Ugalde. Psychology (B.S.). FIU. Fall 2018 – Summer 2019. Now at FIU, Ph.D. in Psychology.

Ψ.8 Amanda Fernandez. Computer Science (B.S.). FIU. Fall 2018 – Spring 2019.

Ψ.9 Andy Pujol. Computer Science (B.S.). FIU. Summer 2018 – Spring 2019. Now at Royal Caribbean Cruise

Ψ.10 Edelmary Urdaneta. Chemistry (B.S.). FIU. Summer 2018 – Spring 2019.

Ψ.11 Joseph Medina. Computer Science (B.S.). FIU. Summer 2018 – Spring 2019.

Ψ.12 Arelys Alvarez. Computer Science (B.S.). FIU. Summer 2018 – Fall 2019.

Ψ.13 Vanesa Perez. Computer Science (B.S.). FIU. Summer 2018 – Spring 2019.

Ψ.14 Jason Garcia. Computer Science (B.S.). FIU. Spring 2018 – Summer 2019. Now at CSU's master program.

Ψ.15 Ciana Rogers. Computer Science (B.S.). FIU. Spring 2018 – Summer 2019.

Ψ.16 Cristina Villaroel. Computer Science (B.S.). FIU. Fall 2017– Fall 2019. Now at VISA (Denver, CO).

Ψ.17 Seidan Jamides. Computer Science (B.S.). FIU. Summer 2017 – Summer 2019.

Ψ.18 Pablo Mueller. Computer Science (B.S.). FIU. Summer 2017 – Summer 2018.

Ψ.19 Luis Averhoff. Computer Science (B.S.). FIU. Fall 2017 – Summer 2018.

Ψ.20 Lukas Borges. Computer Science (B.S.). FIU. Summer 2016 – Fall 2017.

Ψ.21 Maia Zock-Obregon. Psychology (B.S.). FIU. Spring 2016 – FALL 2016.

Ψ.22 Alain Galvan. Computer Science (B.S.). FIU. Spring 2015 – Summer 2017. First job: Marmoset (creator of Marmoset Toolbag) as Computer Graphics Developer.

Ψ.23 Jules Calella. Electrical Engineering (B.S.). FIU. Fall 2015 – Spring 2016. Now at Microsoft Embedded Development. First Job: Bio-Magic VR, Inc.

Ψ.24 Jonathan Bernal. Computer Engineering (B.S.). FIU. Summer 2016 – Summer 2017.

Ψ.25 Katherine Tarre. Statistics (B.S.). FIU. Summer 2016 – Fall 2016.

Ψ.26 Jason-Lee Thomas. Computer Engineering (B.S.). FIU. Summer 2015 – Fall 2016. First job: Citrix as Senior Software Developer.

Other Mentoring Activities (FIU)

- Capstone Senior Project, Computer Science, Spring 2015 - Present – Mentored over 30 students.
- Capstone Senior Design, Electrical and Computer Engineering, Spring 2015 - Present – Mentored over 40 students.
- Independent Studies, Summer 2016.
- Honors College Research, Fall 2015 – Spring 2017.
- VIP Supplemental Team, Spring 2016-Summer 2016 – Mentored 15 students.

SECTION 4: Evidence of Outreach/Service

SERVICE

Editor, Associate Editor, Topic Editor, and Guest-Editor of Journals

- Associate Editor for IEEE Transactions on Visualizations and Computer Graphics (TVCG). November 2024 – Present.

- Topic Editor for Special Edition on Remote XR User Studies Frontiers Journal. https://www.frontiersin.org/research-topics/26920/remote-xr-user-studies. Topic editors included: Dr. Nick Bryans-Kinns, Dr. Laurissa Tokarchuck, Dr. Melynda Hoover, Dr. Jack Ratcliffe, Dr. Liang Men, and **Dr. Francisco R. Ortega**. 2021–2022.
- Track Editorial Board Member for PACM HCI Journal (ISS Track) for *ACM International Conference on Interactive Surfaces and Spaces* (ISS) 2021 – 2022.

Conference International Program Committee Member Positions

- International Program Committee Member Journal and Conference Track *IEEE International Symposium on Mixed and Augmented Reality*, (ISMAR). 2020–2022, 2023 (Journal track only), 2024 (Journal Track only), and 2025 (combined track).
- International Technical Program Super Committee Member IEEE VR Journal and Conference Track, *IEEE Virtual Reality and 3DUI*, 2024.
- International Technical Program Committee Member IEEE VR Journal and Conference Track, *IEEE Virtual Reality and 3DUI*, 2022 – 2025.
- International Technical Program Committee Member ACM Spatial User Interaction, *ACM SUI*, 2023 – 2024.
- International Program Committee Member of *24th ACM Virtual Reality Software and Technology*, (VRST) 2024.
- International Program Committee Member of *24th ACM International Conference on Multimodal Interaction*, (ICMI) '22.
- International Technical Program Committee Member Conference Papers Track, *IEEE Virtual Reality and 3DUI*, 2018 – 2022.
- International Program Committee Member *ACM Cumputer-Human Interaction Late Breaking Work* (LBW CHI'21). 2021.
- International Program Committee Member *ACM International Conference on Interactive Surfaces and Spaces* (ISS' 19), Daejeon, South Korea.
- International Technical Program Committee Member *ACM Symposium on Spatial User Interaction* (SUI '19), New Orleans, LA. 2019.
- International Technical Program Committee Member *ACM Symposium on Spatial User Interaction* (SUI '18), Berlin, Germany, 2018.
- International Technical Program Committee Member *ACM International Conference on Interactive Surfaces and Spaces* (ISS '17), Brighton, England, 2017.
- International Technical Program Committee Member *ACM Symposium on Spatial User Interaction* (SUI '17), Brighton, England, 2017.
- Technical Program Committee Member, *ACM Symposium on 3D User Interfaces* (3DUI '17), Los Angeles, CA, 2017.
- International Technical Program Committee Member, *ACM Symposium on Spatial User Interaction* (SUI '16), Tokyo, Japan, 2016.

Conference Committee Member Positions

- General Co-Chair for *ACM Symposium on Applied Perception* (SAP), 2025.
- General Co-Chair for *ACM Symposium on Virtual Reality Software and Technology 2025* (VRST), 2024 – 2025.
- Co-Organizer and Founding Committee Member, *IEEE VR Second Workshop on Novel Input Devices and Interaction Techniques* 2019 – 2026.
- Co-Organizer Committee Member, *IEEE VR 2023 Workshop on Emerging Novel Prototyping Techniques for XR* (ENPT XR '23). 2022 – 2024.
- General Co-Chair for *ACM Symposium on Spatial User Interaction* (SUI '22). ★
- General Chair for *ACM Symposium on Spatial User Interaction* (SUI '21). ★
- Chair, *IEEE VR Workshop on Novel Input Devices and Interaction Techniques 2021* (NIDIT '21). 2021.
- Chair for *IEEE VR Workshop on Distributed Interactive Systems for Collaboration Experiences* (DISCE '21), 2021.
- Publicity Chair, *International Conference on Artificial Reality and Telexistence & Eurographics Symposium on Virtual Environments (ICAT-EGVE) '20.* 2020.
- Poster Chair, *ACM Virtual Reality and Software Tools (VRST) '20.* Ontario, CA. 2020.
- Publicity Chair, *ACM Virtual Reality and Software Tools (VRST) '20.* Ontario, CA. 2020.
- Bidding Committee Member, *ACM Virtual Reality and Software Tools (VRST) '20.* 2020. Status: Won bid with General Chair Rob Teather.
- Publicity Chair, *International Conference on Artificial Reality and Telexistence & Eurographics Symposium on Virtual Environments (ICAT-EGVE) '20.* 2020.
- Student Volunteer Chair, *IEEE International Symposium on Mixed and Augmented Reality (ISMAR) '20.*
- Co-Organizer Committee Member, *IEEE VR Fifth Workshop on K-12 Embodied Learning through Virtual & Augmented Reality* (KELVAR '20), Atlanta, GA. 2020.
- Session Chair *ACM International Conference on Interactive Surfaces and Spaces* (ISS' 19), Daejeon, South Korea.
- Industry Chair *ACM Symposium on Spatial User Interaction* (SUI '19), New Orleans, LA. 2019. Obtained %5,000 dollar sponsorship.
- General Chair Committee Member, *IEEE VR Fourth Workshop on K-12 Embodied Learning through Virtual & Augmented Reality* (KELVAR '19), Osaka, Japan. 2019.
- Co-Organizer Committee Member, *IEEE VR Third Workshop on K-12 Embodied Learning through Virtual & Augmented Reality* (KELVAR '18), Reutlingen, Germany. 2018.
- Poster Judge Panel for *ACM Richard Tapia Celebration of Diversity in Computing*, 2017.

- Co-Organizer Committee Member, *IEEE VR Second Workshop on K-12 Embodied Learning through Virtual & Augmented Reality* (KELVAR '17), Los Angeles, CA, 2017.
- Session Chair *ACM International Conference on Interactive Surfaces and Spaces* (ISS '17), Brighton, England, 2017.
- Session chair, 3D Interaction, *IEEE VR 3DUI, ACM Symposium on 3D User Interfaces*, (3DUI '17). 2017.
- Publicity Co-chair, *ACM Symposium on Spatial User Interaction* (SUI '17), Brighton, England, 2017.
- Publicity Co-chair, *ACM Symposium on 3D User Interfaces* (3DUI '17), Los Angeles, CA, 2017.
- Publicity Co-chair, *ACM Symposium on Spatial User Interaction* (SUI '16), Tokyo, Japan, 2016.

Journal and Conference Reviewer

- Reviewer Editor for IEEE Transactions on Visualizations and Computer Graphics (TVCG). Ongoing.
- Reviewer for *ACM CHI Conference on Human Factors in Computing Systems* (ACM CHI). 2018–2025.
- Reviewer for *ACM Conference on Designing Interactive Systems* 2022, 2024.
- Reviewer for *ACM MobileHCI* conference. 2023
- Reviewer for *ACM SigGraph Asia.* 2023.
- Reviewer for *IEEE VR Workshop: ENPT XR - Emerging Novel Prototyping Techniques XR.* 2023 – 2024.
- Reviewer for *IEEE VR Workshop NIDIT - Novel Input Devices and Interaction Techniques.* 2019 – 2025.
- Reviewer for *ACM Virtual Reality Tools and Software*, (VRST). 2021–2024.
- Reviewer for *ACM Transactions on Computer-Human Interaction (TOCHI) Journal* 2020–2022, 2024.
- Reviewer for *IEEE Transactions on Visualization and Computer Graphics (TVCG).* 2017, 2018, 2023 – 2025.
- Reviewer for Conference and Journal for *IEEE International Symposium on Mixed and Augmented Reality* (ISMAR). 2020–2024.
- Journal Reviewer for *ACM International Conference on Interactive Surfaces and Spaces*, Summer Session 2021, February Session 2022, and July Session 2022.
- Reviewer for *IEEE VR Workshop on Distributed Interactive Systems for Collaboration Experiences* (DISCE '21), 2021.

- Reviewer for *IEEE Sensors Journal* 2014-2018, 2020.
- Reviewer for *IEEE Journal of Biomedical and Health Informatics.* 2014, 2018.
- Reviewer for *ACM Computer-Supported Cooperative Work and Social Computing*. 2020.
- Reviewer for *ACM Virtual Reality and Software Tools (VRST) '20, Poster Articles.* 2020.
- Reviewer for *Computer and Graphics.* 2018, 2020.
- Reviewer for *EuroVis.* 2020.
- Reviewer for *IEEE Virtual Reality and 3DUI Conference.* 2018–2022.
- Reviewer for *IEEE VR Workshop on K-12 Embodied Learning through Virtual & Augmented Reality* 2017–2020.
- Reviewer for *ACM International Conference on Interactive Surfaces and Spaces* 2017–2020.
- Reviewer for *ACM CHI Conference on Human Factors in Computing Systems – Late Breaking* (ACM CHI). 2019–2020.
- Reviewer for *ACM SIGCSE 2020.* Reviewed in 2019.
- Reviewer for *ACM Designing Interactive Systems 2019* (DIS '19). 2019-2020.
- Reviewer for *IEEE International Symposium on Mixed and Augmented Reality 2019* (ISMAR '19). 2019-2020.
- Reviewer for *ACM Intelligent User Interfaces 2019* (IUI '19). 2019.
- Reviewer for *ACM International Conference on Interactive Surfaces and Spaces.* 2016-2020.
- Reviewer for *ACM Richard Tapia Celebration of Diversity in Computing*, 2015–2019.
- Reviewer for *International Journal of Human-Computer Interaction*, Springer, 2018.
- Reviewer for *20th Symposium on Virtual and Augmented Reality (SVR).* Igauçco, Brazil, 2018.
- Reviewer for *13th International Symposium on Visual Computing*, Las Vegas, NV, 2018.
- Reviewer for *ACM Symposium on 3D User Interfaces.* 2017.
- Reviewer for *ACM Symposium on Spatial User Interaction* 2016-2018.

Book and Book Proposal Reviewer

- Full Book Review. VR Book, Jason Jerald. 2014.

International Service Position in the field

- IEEE TVCG (Part of IEEE Computer Society), IEEE VGTC Ethics and Diversity Co-Chair. Appointed by Steering Committee after application. Term: 2024 – 2027.

Proposal Review

The following list is redacted for confidentiality.

- National Science Foundation. Review Panel. Two Days. 2025.
- National Science Foundation. Review Panel. Two days. 2024.
- National Science Foundation. Review Panel. One day. 2023.
- National Science Foundation. Review Panel. Two days. 2023.
- National Science Foundation. Review Panel. Two days. 2022.
- National Science Foundation. Review Panel. Two days. 2021.
- National Science Foundation. Review Panel. One day. 2020.
- National Science Foundation. Review Panel. 2019. Two days.
- National Science Foundation. Review Panel. 2019. Two Days
- National Science Foundation. Review Panel. One day. 2019.

Internal (CSU)

- University
  - Search Committee Member for new CNS Dean (Hiring authority: Provost), 2024 – 2025.
  - Member of Provost's Council for Engagement. 2022–2023.
  - DARPA Forward NUILAB Demonstrations for ONR Program Officer, Dr Jeff Moris. August 30, 2022.
  - Collaborations in Mental Wellness - DARPA Forward Pre-Event Demonstration. August 29, 2022.
  - Office of Vice-President Research VR Hackathon Orientation. University-Wide for students. October 24, 2022.
  - Office of Vice-President Research (OVPR), Virtual Reality Committee Member (2019–2022). Virtual Reality Initiative.
  - Office of Vice-President Research (OVPR), VR Hackathon (2019–2022) Committee Member.
  - Office of Vice-President Research (OVPR), VR Symposium (2019–2020) Committee Member and Facilitator.
  - Boettcher Foundation Trustees Learning Track VR/AR Research Demo. Hosted by Colorado State University. September 6, 2019.
  - Boettcher Foundation VR/AR Presentation. Hosted by OVPR in the Richardson Design Center, CSU. June 7, 2019.

  - VR Hackathon 2019 Recruiter.
  - VR Hackathon 2018 Recruiter.
  - VR Hackathon 2018 Judge.
  - Participated in the ISTEC Advisory Board Fall 2018. This included facilitating the Virtual Reality sub-group.

- College
  - College Representative for Provost's Council for Engagement. 2022–2023.
  - Math and Science Technology Day. Fall 2019.
  - Math and Science Technology Day. Fall 2018.

- Departmental Committees
  - Computer Science Operational Committee member, Fall 2019–Summer 2023, Fall 2025 – Spring 2026.
  - Chair Faculty Search for Cybersecurity Fall 2024 – Spring 2025.
  - Computer Science Graduate Recruiting Committee member, Fall 2023–Spring 2025.
  - ad-hoc C++ course coordination along with Dr. Bruce Draper and Mr. Logan Seabolt, Fall 2023–Present.
  - Ad-hoc committee member for CS For Creative Concentration, Fall 2023.
  - Faculty Search for Associate Professor, Fall 2023–Spring 2024.
  - Executive Committee Member (**elected**), Fall 2023–present.
  - Lunch for Hispanics in CS First Year. Attended several weekly lunches. Fall 2022–present.
  - AI Search Committee Member 2021-2022.
  - Computer Science Graduate Program Committee member, Fall 2019–Summer 2023.
  - Multiple events for CS recruitment, including ChooseCSU in 2020 (see talks).
  - Chair of Search Committee, Academic Success Coordinator, 2019–2020. Cancelled by Provost because of COVID-19.

- Departmental Service
  - Participated in one session for NSF CAREER for new faculty organized by Dr. Indrajit Ray. 2024.
  - Multiple tours of NUILAB during 2024.
  - Organized one session for NSF CAREER in CS Department with some assistant professors. With the participation of Dr. Indrajit Ray.
  - Faculty Mentor for ARVR Student Club. 2018–present.
  - Organized Workshop (3 sessions) for CS Scholars in CS department. Including Dr. Marcia Moraes, Dr. Ameni Altarawneh. With the participation of Dr. Indrajit Ray.

- ◇ NUI LAB Demonstrations for middle school children. Three distinct sessions with different children. July 13, 2022.
- ◇ VR Demonstration. Math in Action Computer Science. 24 Participants (22 middle school students, 2 teachers). June 10, 2022.
- ◇ Demonstrations, and Guest Lecture. SWiFT22. (15 high school participants). June 7, 2022.
- ◇ Choose CSU: Session 3 Demo NUI Lab. April 2, 2022.
- ◇ NUI Lab Tour and Demonstration. Office of the Vice President. January 22, 2022.
- ◇ NUI Lab Demonstration. United States Air Force Academy. (4 participants). January 18, 2022.
- ◇ Other NUI Lab Demonstration 2022 (including TTF finalist and other CSU faculty) February 14, 2022, February 23, 2022, April 28, 2022, March 5, 2022, August 2, 2022, December 6, 2022, and December 8, 2022.
- ◇ Multiple events for CS recruitment, including ChooseCSU in 2020 (see talks).
- ◇ ACM Richard Tapia 2020 Scholarship Organizer for CSU. Organized students to provide access to ACM Tapia 2020. 12 students were sent from CSU using different funds.
- ◇ ACM Richard Tapia Conference 2019. Hosted a booth for Colorado State University promoting Computer Science Program and supporting our attending students. October 2019.
- ◇ Compass School for Fort Collins visit, 15 participants (middle school to high school). This included NUILAB tour and Demonstrations. December 11, 2019.
- ◇ Choose CSU (CSU admission event for prospective students), 60 participants (parents and high school seniors). This included NUILAB tour and demonstrations. December 7, 2019.
- ◇ Girls Who Code. Virtual and Augmented Reality presentation. December 2, 2019.
- ◇ ACM GMH/Tapia Pane. November 6, 2019.
- ◇ Target Visit (with Arthur Valdez). Search for students to participate in event and attended main event. October 16, 2019.
- ◇ Early Start Freshmen, 40 participants (incoming CSU undergraduate students in STEM). This included NUILAB tour and demonstration. August 20, 2019.
- ◇ Access Center High School Tour, 10 participants (first generation high-school students). This included NUILAB tour and demonstration. July 29, 2019.
- ◇ Middle School Girls STEM Camp, 12 participants (female students in middle-school). This included NUILAB tour and demonstration. July 12, 2019.
- ◇ Choose CSU (CSU admission event for prospective students), 70 participants (parents and high school seniors). This included NUILAB tour, demonstrations, and Presentation by **Francisco R. Ortega**. April 6, 2019.
- ◇ Middle School Stem Camp, 20 participants (middle school). This included NUILAB tour and demonstration. June 19, 2019.

  - ◇ High School Computer Science Day, 60 participants (high school students). his included NUILAB tour, demonstrations, and Presentation by Kellyn Dassler. February 7, 2019.
  - ◇ Choose CSU (CSU admission event for prospective students), 70 participants (parents and high school seniors). This included NUILAB tour, demonstrations, and Presentation by **Francisco R. Ortega**. February 2, 2019.
  - ◇ Workshop for scholarship applications for ACM Tapia and ACM Grace Hoper. Spring 2019.
  - ◇ CSU's Incoming Students Computer Science Tour. Fall 2019.
  - ◇ CSU's Incoming Students Computer Science Tour. Spring 2019.
  - ◇ CSU's Incoming Students Computer Science Tour. Fall 2018.
- Official Mentoring (Dept)
  - ◇ Mentor for Dr. Ravi Mangal (Spring 2025 – present). Chosen by Faculty.
  - ◇ Mentor for Dr. Bianca Trinkenreich (Fall 2024 – present). Assigned by Dept.
  - ◇ Mentor for Dr. Fabio De Abreu Santo (Fall 2024 – present). Chosen by Faculty.
- NUILAB (Research Lab)
  - ◇ Unreal Engine Workshop (6 sessions). Summer 2019.

Internal (FIU)

- University
  - ◇ Member of Florida Consortium of Metropolitan Research Universities. Representing Florida International University, 2016-2018.
  - ◇ FIU Beyond 2020 program, working panel to proposed how to increase doctoral and post-doc students, 2016. .
  - ◇ VR Hackathon 2018 Judge.
  - ◇ Participated in the ISTEC Advisory Board Fall 2018. This included facilitating the Virtual Reality sub-group.
- College
  - ◇ Java Workshop for Electrical and Computing Engineering (5 sessions). 2013.
- Departmental
  - ◇ Programming Workshop for capstone projects (C++, C), hosted by NUILAB (formerly known as OpenHID) Labs. 2015-2016.
  - ◇ Carnegie Doctoral Program Self-Studies and Strategic Planning with faculty and Ph.D. students working group, 2009.

ACADEMIC AFFILIATIONS

- Association for Computing Machinery (ACM) Professional Member. 2006 – Present.

SECTION 5: References/Demographics/Other Additional Information

LANGUAGES

Proficient in English and Spanish.

DEMOGRAPHICS

Nationalities: U.S Citizen, Chilean Citizen.

Ethnicity: Hispanic.

REFERENCES

References upon request.