Francielly Rodrigues

HCI XR Researcher - Presidential Postdoctoral Fellow at Virginia Tech, USA
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SUMMARY

I am a Human-Computer Interaction (HCI) researcher with expertise in inclusive, intelligent extended reality (iXR) systems. My research investigates how contextual information can enable XR interfaces to dynamically adapt to users, supporting accessibility and well-being in everyday environments. My interests span extended reality (AR, VR, MR), 3D user interfaces, and human-centered AI.

EDUCATION

Ph.D. in Computational Modeling Jun 2019 – Jan 2024
National Laboratory for Scientific Computing (LNCC), Rio de Janeiro, Brazil

- Dissertation: "Advancing 3D Manipulation in Virtual Reality: Design and Evaluation of High-Precision Techniques and a Comprehensive Taxonomy." [J.3] [C.6].
- Advisors: Jauvane C. de Oliveira and Doug A. Bowman
- Graduate Program rated 7/7 by CAPES, held by approximately 7% of graduate programs in Brazil.

M.Sc. in Computational Modeling Mar 2017 – Jun 2019
National Laboratory for Scientific Computing (LNCC), Rio de Janeiro, Brazil

- Thesis: "A Virtual Reality Environment Using Concepts of Serious Games and Gamification for the Treatment of Eating Disorders." [C.5].

B.S. in Computer Science May 2013 – Feb 2017
Federal University of Sao Joao Del-Rey (UFSJ), Minas Gerais, Brazil

- Thesis: "Investigation of Mobility Patterns and Analysis of Social Strata in Rio de Janeiro." [C.4].

RESEARCH EXPERIENCE

Presidential Postdoctoral Fellow Apr 2025 – Present
Department of Computer Science, Virginia Tech, USA

- Faculty mentor: Doug A. Bowman
- Affective iXR (primary research project): Conceived and currently lead a research project investigating how artificial intelligence can be leveraged to infer users' affective states (emotions) in real time and enable XR systems to adapt intelligently to support well-being and productivity in everyday contexts.
- CalmAR: Served as project manager coordinating a team of three faculty members on research activities and project execution. Contributed to the development of a series of prototypes and design principles for envisioning future extended reality systems that support users' well-being and productivity while remaining unobtrusive and calm. Led the writing of a published workshop paper to disseminate the outcomes of the project [C.7].

Doctoral Researcher Jun 2019 – Jan 2024
National Laboratory for Scientific Computing (LNCC), Brazil

- Primary doctoral research project: *Understanding Precise Object Manipulation in Virtual Environments*
  - Led and conducted research on the design and evaluation of novel 3D manipulation techniques for highly precise tasks in virtual reality [C.6] and a framework for describing spatial manipulation in virtual environments [J.3].
  - Designed and conducted two controlled user studies demonstrating performance improvements over state-of-the-art methods. Continue to collaborate on related project led by another researcher [J.2].
- Visiting Research Scholar at Virginia Tech, USA
  - Conducted part of my doctoral research in the Department of Computer Science at Virginia Tech, from Aug 2022 to Jul 2023, hosted by Dr. Doug A. Bowman at the 3D Interaction Group.
  - Contributed to several other projects, including non-verbal visualizations in immersive collaboration [J.1], a hybrid cross-reality platform for collaborative literature review and spatial argumentation with LaTeX export [C.2], and an immersive VR authentication experience for secure access in the Metaverse [C.1].

Master's Researcher Mar 2017- Jun 2019
National Laboratory for Scientific Computing (LNCC), Brazil

- Primary master's research project: Exploring Gamification in Virtual Reality for Eating-Disorder Treatment
  - Conceived, developed and evaluated a virtual reality environment integrating serious-game and gamification concepts to support the treatment of eating disorders. Collaborated with a psychologist and a nutritionist to inform the clinical content and design of the environment. Conducted a user study with 10 participants assessing usability and sense of presence, with results indicating that the environment was suitable for potential use in clinical treatment [C.5].

TEACHING EXPERIENCE

Instructor of record: CS 2506 – Introduction to Computer Organization II Summer 2026
Department of Computer Science, Virginia Tech, USA

- Taught required undergraduate course covering computer organization, assembly language, memory systems, processor architecture, and multiprocessor and multithreaded systems.
- Designed and delivered lectures, redesigned instructional materials and assessments, and supported student learning through office hours, practice sessions, and individualized feedback.

GRANTS AND FUNDING

Enabling Low-friction Intelligent XR (ELIXR) - Funded 2026
Virginia Tech Major Grants Initiative (Track II)

- Role: Project manager
- Collaborated on developing the proposed technical approach, wrote and reviewed proposal sections. Continues to facilitate team-building and collaboration while managing cross-team coordination and submission deadlines across partner institutions in preparation for a multi-institutional NSF Expeditions submission.
- Amount awarded: $199,957

Intelligent XR - Funded 2025
Virginia Tech Major Grants Initiative (Track I)

- Role: Project manager
- Co-developed the technical vision, authored and reviewed proposal sections, and contributed to project activities to facilitate new collaborations and team formation.
- Amount awarded: $49,999

CalmAR: Envisioning calm and intelligent near-future AR experiences - Funded 2025
Virginia Tech ICAT SEAD Grant

- Role: Project manager
- Contributed to proposal development, technical approach design, work plan preparation, and post-award project coordination, including dissemination and outreach activities. Organized group presentation in ICAT Day and ICAT Playdate events. Resulting research was published in [C.7].
- Amount awarded: $16,000

Beneath the Cloud: How Everyday Choices Shape Climate Futures - Unfunded 2026
Agog: The Immersive Media Institute Open Call

- Role: Proposal Co-author & coordinator
- Assembled a multidisciplinary team spanning climate science, computer science, and design experts. Organized collaborative meetings, developed the overarching scientific vision, and coordinated the final submission.

Improving Motor Accessibility in XR Through Intelligent Prediction of User Intent - Unfunded 2025
Sony Faculty Innovation Award

- Role: Lead proposal writer (unlisted due to eligibility rules restricting postdoctoral researchers from PI/Co-PI status)
- Led proposal conception and writing, organizing and facilitating team brainstorming and discussion sessions to translate collaborative ideas into a cohesive technical plan.

SELECTED PUBLICATIONS

JOURNAL

[J.3] Francielly Rodrigues; Run Yu; Doug A. Bowman, "Understanding 3D Mid-Air Spatial Manipulation in Immersive Environments: A Taxonomy and Visual Representation," in *IEEE Transactions on Visualization and Computer Graphics*, Accepted.

[J.2] Cherelle Connor; Alexander Giovannelli; Leonardo Pavanatto; Francielly Rodrigues; Haichao Miao; Vuthea Chheang; Brian Giera; Peer-Timo Bremer; Doug A Bowman, "Re-evaluating virtual reality manipulation techniques for precise alignment of complex 3d objects," in *IEEE Transactions on Visualization and Computer Graphics*, Apr 2026.

[J.1] Alexander Giovannelli; Jerald Thomas; Logan Lane; Francielly Rodrigues; Doug A Bowman, "Gestures vs. Emojis: Comparing Non-Verbal Reaction Visualizations for Immersive Collaboration," *IEEE Transactions on Visualization and Computer Graphics*, Oct 2023.

CONFERENCES

[C.7] Francielly Rodrigues; Meaghan Dee; Todd Ogle; Mason Szczesniak; Leo Robbins; Doug A Bowman, "CalmAR: Principles for Calm and Intelligent Everyday AR Experiences" in *Proceedings of the 2026 IEEE International Symposium on Mixed and Augmented Reality Adjunct* (ISMAR-Adjunct), 2026. Accepted.

[C.6] Francielly Rodrigues; Alexander Giovannelli; Leonardo Pavanatto; Haichao Miao; Jauvane C de Oliveira; Doug A Bowman, "AMP-IT and WISDOM: Improving 3D Manipulation for High-Precision Tasks in Virtual Reality," in *IEEE International Symposium on Mixed and Augmented Reality (ISMAR)*, Oct 2023.

[C.5] Francielly Rodrigues; Priscila Wilbert; José Carlos Tavares da Silva; Jauvane C de Oliveira, "A virtual reality environment using concepts of serious games and gamification for the treatment of eating disorders," in *Brazilian Symposium on Computing Applied to Health (SBCAS)*, Jun 2019. [Best Paper Award]

[C.4] Francielly Rodrigues; Carolina R Xavier; Alexandre G Evsukoff; Artur Ziviani; Vinícius da F Vieira, "Análise de Mobilidade Urbana em Diferentes Estratos Sociais a partir de uma Rede de Telefonia Móvel," in *Anais do II Workshop de Computação Urbana*, SBC, May 2018.

[C.3] Matthew Gallagher; Mason Szczesniak; Francielly Rodrigues; Nakul Kumar; Jasmine Walker; Hamid Tarashiyoun; Doug A Bowman, "From Slides to Space: Interactive Scale Navigation for XR Presentations," in *IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW) Student Competition*, Oct 2023. [Contest Winner]

[C.2] Ibrahim A Tahmid; Francielly Rodrigues; Alexander Giovannelli; Lee Lisle; Jerald Thomas; Doug A Bowman, "CoLT: Enhancing Collaborative Literature Review Tasks with Synchronous and Asynchronous Awareness Across the Reality-Virtuality Continuum," in *IEEE International Symposium on Mixed and Augmented Reality (ISMAR) Student Competition*, Oct 2023.

[C.1] Alexander Giovannelli; Francielly Rodrigues; Shakiba Davari; Ibrahim A Tahmid; Logan Lane; Cherelle Connor; Kylie Davidson; Gabriella N Ramirez; Brendan David-John; Doug A Bowman, "CLUE HOG: An Immersive Competitive Lock-Unlock Experience using Hook On Go-Go Technique for Authentication in the Metaverse," in *IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW) Student Competition*, Mar 2023.

AWARDS & SCHOLARSHIPS

Presidential Postdoctoral Fellowship, *Virginia Tech, USA* Apr 2025 – Present

- Competitive institutional fellowship supporting postdoctoral scholars in conducting novel independent research and developing their academic careers.

Scientific Mobility Program scholarship recipient, *CAPES, Brazil* 2022 – 2023

- Visiting doctoral researcher fellowship for an exchange program abroad at Virginia Tech, USA.

Academic Excellence fellowship, *CAPES, Brazil* 2017 – 2023

- Full-tuition fellowship achieved and maintained due to high performance at Master's and Ph.D. programs.

Best Full Paper Winner Award, *SBCAS'19, Brazil* 2019

- Paper: "A virtual reality environment using concepts of serious games and gamification for the treatment of eating disorders" in *Brazilian Symposium on Computing Applied to Health (SBCAS)* [C.5]

Outstanding Undergraduate Student, *Brazilian Computer Society (SBC), Brazil* 2017

- Outstanding student with the highest GPA of the graduating class of 2017.

SERVICE

Conference Organization

Doctoral Consortium Chair at IEEE ISMAR 2026; 3DUI Contest Chair at IEEE VR 2027 *(scheduled)*.

Peer-Review Service

- Conferences: IEEE VR 2027, 2026; SVR 2026; CHI 2026; ISMAR 2026, 2025 *(Outstanding Reviewer)*, 2023.
- Journals: International Journal of Human–Computer Studies (IJHCS), 2023.

PRESENTATIONS

Invited Talks

- Headliner: *"A Deep Dive into Precise Manipulation in Immersive Environments."*
  - Weekly Seminar Series at the Center for Human-Computer Interaction, Virginia Tech – USA, 2026.
- Keynote Speaker: *"Sandwich Ph.D: My experience at Virginia Tech."*
  - VIII Confeso: Unifeso's annual Academic-Scientific Conference, Brazil, 2023.

Academic Paper and Demo Presentations

- The 25th IEEE International Symposium on Mixed and Augmented Reality (ISMAR'26), Bari, Italy *(scheduled)*
- The 22nd IEEE International Symposium on Mixed and Augmented Reality (ISMAR'23), Sydney, Australia
- The 19th Brazilian Symposium on Computation Applied to Health (SBCAS'19), Rio de Janeiro, Brazil
- The 20th Symposium on Virtual and Augmented Reality (SVR'18), Foz do Iguacu, Brazil
- 2nd Urban Computing Workshop (COURB'18 in SBRC'18), Sao Paulo, Brazil

SKILLS

Research expertise: Human–Computer Interaction (HCI), Extended Reality, Virtual and Augmented Reality, 3D User Interfaces, Affective Computing, Adaptive and Intelligent Interactive Systems, AI for XR, Precise 3D Interaction.

Research methods and technical skills: Quantitative and qualitative research, controlled user studies, experimental design, user experience and usability evaluation, statistical analysis, data visualization (Python, R)

LANGUAGES

Portuguese: Native; English: Fluent; Spanish: Intermediate; Italian: Beginner