Alexander Giovannelli

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Summary

My research interest lies in the intersections of Human-Computer Interaction (HCI), Augmented/Virtual Reality (AR/VR), and 3D User Interfaces (3DUI) for collaboration. I am exploring how to improve asynchronous collaborative processes using immersive technologies. Specifically, I am prototyping and evaluating systems that capture presenter actions, providing supplemental visuals and interactive mechanisms for observer playback.

Education

Virginia Tech — Blacksburg, VA, USA
Ph.D. in Computer Science advised by Doug A. Bowman, GPA: 4.00/4.00 — Aug. 2021–Present

University of Cincinnati — Cincinnati, OH, USA
B.S. in Computer Engineering with German Studies minor, GPA: 3.30/4.00 — Aug. 2013–May 2018

Research Experience

Virginia Tech — Blacksburg, VA, USA
Graduate Research Assistant — Spring 2023 & Fall 2023

- Investigated methods for asynchronous and synchronous collaboration in immersive experiences
- Performed contextual inquiry and analysis to determine research goals
- Created prototype virtual reality applications using C# and Unity technologies

Lawrence Livermore National Laboratory — Livermore, CA, USA
Computing Research Intern — Summer 2023

- Developed guided tour prototypes for inspection processes in virtual reality using C# and Unity technologies
- Facilitated meetings between multi-disciplinary project stakeholders
- Prepared user study procedure for evaluation of prototype capabilities

Virginia Tech — Blacksburg, VA, USA
Graduate Research Assistant — Summer 2022

- Conducted research regarding communication via avatars in augmented and virtual reality
- Generated prototype applications and experimental studies using C# and Unity technologies
- Designed and administered user studies in accordance with Institutional Review Board regulations

Work Experience

JPMorgan Chase & Co. — Columbus, OH, USA
Associate Software Engineer I — Jul. 2018–Jul. 2021

- Developed front-end features for Chase.com using JavaScript, HTML, and CSS technologies
- Designed and implemented minimum viable product user interfaces via Figma design tool
- Authored technical documentation for product owners and developers
- Appointed subject matter expert in behavioral-driven development and CI/CD initiatives
- Automated logging of proprietary systems using the Python programming language

Siemens Healthineers Forchheim, BY, DE
Software Engineer Intern Jan. 2017–Aug. 2017

- Developed back-end software for use in advanced therapy devices using the C# programming language
- Created system architecture diagrams to record project design changes and behaviors
- Represented project team in international software integration meetings using German and English languages

Granville Exempted Village Schools Granville, OH, USA
Systems Administrator Intern May 2016–Jul. 2016

- Provisioned Windows and Linux server and workstation systems to support school network infrastructure
- Administered changes to proprietary devices regarding operating system applications, packages and images
- Managed summer technician team operations

Matrix Technologies, Inc. Maumee, OH, USA
Computer Programmer and Systems Analyst Intern Aug. 2015–Dec. 2015

- Created full-stack internal software tools for engineers and project managers using C#, XML and SQL
- Updated existing project management software according to submitted user feedback
- Authored software usage documents to elaborate on internal tool usage

Matrix Technologies, Inc. Maumee, OH, USA
Computer Programmer and Systems Analyst Intern Aug. 2014–Dec. 2014

- Enhanced existing proprietary software using the C# programming language
- Researched emerging technologies and presented potential process improvements for development team
- Coordinated project design changes with stakeholders

Publications

Peer Reviewed Journal Papers

J1. **A. Giovannelli**, J. Thomas, L. Lane, F. Rodrigues and D. A. Bowman, "Gestures vs. Emojis: Comparing Non-Verbal Reaction Visualizations for Immersive Collaboration," in *IEEE Transactions on Visualization and Computer Graphics, vol. 29, no. 11, pp. 4772-4781, Nov. 2023*, doi: 10.1109/TVCG.2023.3320254.

Peer Reviewed Conference Papers

C1. F. Rodrigues, **A. Giovannelli**, L. Pavanatto, H. Miao, J. C. d. Oliveira and D. A. Bowman, "AMP-IT and WISDOM: Improving 3D Manipulation for High-Precision Tasks in Virtual Reality," in *2023 IEEE International Symposium on Mixed and Augmented Reality (ISMAR), Sydney, Australia, 2023, pp. 303-311*, doi: 10.1109/ISMAR59233.2023.00045.

C2. **A. Giovannelli**, L. Lisle, and D. A. Bowman, "Exploring the impact of visual information on intermittent typing in virtual reality", in *2022 IEEE International Symposium on Mixed and Augmented Reality (ISMAR), 2022, pp. 8–17*, doi: 10.1109/ISMAR55827.2022.00014.

Peer Reviewed Workshops, Posters, Abstracts, & Contests

W1. I. A. Tahmid, F. Rodrigues, **A. Giovannelli**, L. Lisle, J. Thomas and D. A. Bowman, "CoLT: Enhancing Collaborative Literature Review Tasks with Synchronous and Asynchronous Awareness Across the Reality-Virtuality Continuum," in *2023 IEEE International Symposium on Mixed and Augmented Reality Adjunct (ISMAR-Adjunct), Sydney, Australia, 2023, pp. 831-836*, doi: 10.1109/ISMAR-Adjunct60411.2023.00183.

W2. **A. Giovannelli**, F. Rodrigues, S. Davari, I. A. Tahmid, L. Lane, C. Connor, K. Davidson, G. N. Ramirez, B. David-John, and D. A. Bowman, "Clue hog: An immersive competitive lock-unlock experience using hook on go-go technique for authentication in the metaverse", in *2023 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW), 2023, pp. 945-946*, doi: 10.1109/VRW58643.2023.00315.

W3. J. Thomas, S. W. Lee, **A. Giovannelli**, L. Lane, and D. Bowman, "A communication-focused framework for understanding immersive collaboration experiences", in *2023 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW), 2023, pp. 301–304*, doi: 10.1109/VRW58643.2023.00070.

W4. L. Lisle, F. Lu, S. Davari, I. A. Tahmid, **A. Giovannelli**, C. Llo, L. Pavanatto, L. Zhang, L. Schlueter, and D. A. Bowman, "Clean the ocean: An immersive vr experience proposing new modifications to go-go and wim techniques", in *2022 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW), 2022, pp. 920–921*, doi: 10.1109/VRW55335.2022.00311.

W5. E. Mohammadrezaei, **A. Giovannelli**, L. Lane, and D. Gračanin, "A digital twin based approach to smart lighting design", in *2022 Winter Simulation Conference (WSC), 2022.*

Skills

Programming Languages: C#, JavaScript, Java, Python, HTML, CSS

Productivity Tools: Unity, Git, JMP, SPSS, LaTeX, Tableau

Projects

- Gesture-based 3DUI for Arithmetic Operations — Dec. 2023–Present
  Design and prototyping of a virtual environment for embodied learning of arithmetic operations
- Guided Tours for Multiscale Collaborative Virtual Environments — Jul. 2023–Present
  Design and prototyping of a virtual environment for collaboration in multiscale inspection processes
- Surface Generation for MR Remote Collaboration — Jun. 2022–Sept. 2023
  Prototyping and testing of multi-user environment for shared surface creation and collaboration

Awards

- I/ITSEC Leonard P. Gollobin Scholarship — 2023
- Davenport Leadership Fellowship — 2023–2024
- Best Conference Paper Honorable Mention IEEE ISMAR 2022 [C2] — 2022
- Best 3DUI Contest Entry [W4] — 2022
- International Co-op Program Scholarship — 2016–2017
- Matrix Technologies, Inc. Co-op Scholarship — 2014–2016

Professional Service

- Committee Member — 2024–Present
  Inaugural member of the Virtual Experience Research Accelerator (VERA) Ethics and Privacy Committee
- Communications Chair — 2023–Present
  Develop and moderate discussion platforms for the IEEE VR 2024 conference
- Student Volunteer — 2023
  Assist in event operations at IEEE International Symposium on Mixed and Augmented Reality 2023
- Student Volunteer — 2023
  Assist in event operations at IEEE VR 2023 satellite event in Blacksburg, Virginia
- Student Volunteer — 2022
  Assist in event operations at IEEE International Symposium on Mixed and Augmented Reality 2022
- Member of Computer Science Graduate Student Council — 2021–Present
  Represent the interests of the CS graduate student body and assist in event planning

- Member of the Center for Human-Computer Interaction 2021–Present
  Active participant in the Center seminars regarding the study of human-computer interaction

Teaching

- **Graduate Teaching Assistant** at Virginia Tech Fall 2022
  Comparative Languages (CS-3304)
- **Graduate Teaching Assistant** at Virginia Tech Fall 2021 & Spring 2022
  Software Design & Data Structures (CS-2114)