Alexander Giovannelli

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Summary

My research focuses on the intersection of human-computer interaction (HCI), extended reality (XR), and 3D interaction. I am currently developing and evaluating systems that facilitate both real-time, synchronous collaboration for simultaneous user cooperation, as well as recording and playback functionalities to support asynchronous collaboration over different time periods.

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 — Jan. 2023–Present

- Investigate the usage of extended reality technologies for time and place attributes of collaborative tasks
- Design and develop extended reality prototype applications according to project stakeholder specifications
- Report and publish findings from user studies evaluating prototype features

Lawrence Livermore National Laboratory — Livermore, CA, USA
Computing Research Intern — May 2023–Aug. 2023

- Coordinated meetings with subject matter experts to derive a summer research initiative and objective
- Designed and developed virtual reality prototype applications to assist in remote collaborative processes
- Enhanced prototype capabilities following stakeholder evaluations and user study feedback

Virginia Tech — Blacksburg, VA, USA
Graduate Research Assistant — May 2022–Aug. 2022

- Researched and identified knowledge gaps in avatar-mediated communication for extended reality
- Documented and presented systematically reviewed literature to stakeholders for proposed project approval
- Developed, evaluated, and published findings from the resulting extended reality prototype

Work Experience

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

- Lead development and design of Chase COVID Hub to assist and inform clients of available financial assistance
- Developed Chase Security Center to provide ease of access to client security and privacy settings
- Maintained and enhanced the Chase Offers feature across web and mobile platforms
- Acted as the subject matter expert for the behavioral-driven development initiative of Chase.com
- Documented and presented new feature highlights and advancements to project stakeholders

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

- Developed a procedural management system to assist physician usage of advanced therapy devices
- Produced system architecture diagrams to document project design modifications and functionalities
- Participated in international software integration meetings utilizing both German and English languages

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

- Managed Windows and Linux servers to maintain and improve school network infrastructure
- Regulated software updates to devices including operating systems and applications
- Lead a team of technicians to fulfill field service requests on behalf of school staff

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

- Conducted field service interviews with various stakeholders to distill features for user experience improvements
- Designed and developed internal software tools to automate project management processes
- Evaluated software tool quality in accordance with end-user feedback to improve existing tool capabilities

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

- Developed a managerial dashboard for tracking project data including financial and engineering documents
- Proposed, implemented, and evaluated front-end design changes for improved end-user application experience
- Participated in multi-disciplinary planning meetings to add and supplement the application feature backlog

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. L. Lane, **A. Giovannelli**, I. A. Tahmid, F. Rodrigues, C. Ilo, D. Hsu, C. Lougiakis, S. Davari, and D. A. Bowman, "The Alchemist: A Gesture-Based 3D User Interface for Engaging Arithmetic Calculations", *to appear in 2024 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW), 2024.*

W2. 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.

W3. **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.

W4. 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.

W5. 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.

W6. 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.*

Projects

- Guided Tours for Multiscale Collaborative Virtual Environments — Jul. 2023–Jul. 2024
  Design and prototype a virtual environment for collaborative multiscale inspection processes
- Surface Generation for Extended Reality Collaboration — Jun. 2022–Sept. 2023
  Prototype and test a multi-user environment for creating and collaborating on shared surfaces

Awards

- Davenport Leadership Fellowship — 2023–2024
- I/ITSEC Leonard P. Gollobin Scholarship — 2023
- Best Conference Paper Honorable Mention IEEE ISMAR 2022 [C2] — 2022
- Best 3DUI Contest Entry [W5] — 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
- 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
  Actively participate in seminars at the Center focusing on the study of human-computer interaction
- Communications Chair — 2023
  Developed and moderated discussion platforms for the 2024 IEEE VR conference
- Student Volunteer — 2023
  Assisted in event operations at the 2023 IEEE International Symposium on Mixed and Augmented Reality
- Student Volunteer — 2023
  Assisted in event operations at the 2023 IEEE VR satellite event
- Student Volunteer — 2022
  Assisted in event operations at the 2022 IEEE International Symposium on Mixed and Augmented Reality

Teaching

- **Graduate Teaching Assistant** at Virginia Tech — Aug. 2022–Dec. 2022
  Comparative Languages (CS-3304)
- **Graduate Teaching Assistant** at Virginia Tech — Jan. 2022–May 2022
  Software Design & Data Structures (CS-2114)
- **Graduate Teaching Assistant** at Virginia Tech — Aug. 2021–Dec. 2021
  Software Design & Data Structures (CS-2114)

Skills

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

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