

AYUSH BHARGAVA

PhD Computer Science

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RESEARCH INTERESTS

Human-Computer Interaction (HCI), Virtual Reality (VR), Augmented Reality (AR), Mixed Reality (MR), 3D interaction metaphors, Self-Avatars, integration of functional tangibles in immersive environments, Perception-Action, Cybersickness.

EDUCATION

PH.D. COMPUTER SCIENCE

Advisor: Dr. Sabarish V. Babu

Dissertation: The Effect of Anthropometric Properties of Self-Avatars on Action Capabilities in Virtual Reality ([pdf](#))

Clemson University
Clemson, SC
August 2015 – December 2019

M.S. COMPUTER SCIENCE

Advisor: Dr. Sabarish V. Babu

Clemson University
Clemson, SC
January 2014 – August 2015

B.S. COMPUTER SCIENCE

Advisor: Dr. Mark Smotherman

Clemson University
Clemson, SC
August 2012 – December 2013

DIPLOMA – COMPUTER SCIENCE

Ansal Institute of Technology
Gurgaon, India
August 2010 – May 2012

PROFESSIONAL EXPERIENCE

MIXED METHODS UX RESEARCHER

Facebook Reality Labs

July 2021 – Present
Burlingame, CA

XR UX RESEARCHER

Key Lime Interactive

January 2020 – July 2021
Brooklyn, NY

GRADUATE RESEARCH ASSISTANT

Virtual Environments Group, Clemson University

August 2013 – December 2019
Clemson, SC

WEB DEVELOPMENT INTERN

Mobile Innovation Team
Clemson Computing & Information Technology

June 2019 – August 2019
Clemson, SC

GRADUATE TEACHING ASSISTANT

School of Computing, Clemson University
Courses: Virtual Reality Systems, Human-Centered Computing, Operating Systems

August 2018 – June 2019
Clemson, SC

PEGAS WEBMASTER

Graduate Student Government, Clemson University

August 2017 – August 2018
Clemson, SC

DIRECTOR OF TECHNOLOGY

Graduate Student Government, Clemson University

January 2017 – August 2018
Clemson, SC

VIRTUAL REALITY DEVELOPER

Clemson University Center for Workforce Development

January 2016 – August 2018
Clemson, SC

GRADUATE IT ASSISTANT

August 2014 – December 2015

Graduate School Office, Clemson University
WEB INTERN
Campus Banner + Design (CB+D),
Student Affairs Publications, Clemson university

Clemson, SC
January 2013 – December 2013
Clemson, SC

HONORS AND AWARDS

DOCTORAL DISSERTATION COMPLETION GRANT RECIPIENT Offices of the Vice President for Research and the Dean of the Graduate School, Clemson University	July 2019 Clemson, SC
HF RESEARCH INSTITUTE TRAVEL GRANT RECIPIENT Clemson University	February 2019 Clemson, SC
GRADUATE TRAVEL GRANT RECIPIENT Clemson University	November 2018 Clemson, SC
HF RESEARCH INSTITUTE TRAVEL GRANT RECIPIENT Clemson University	February 2018 Clemson, SC
PROFESSIONAL ENRICHMENT GRANT RECIPIENT Clemson University	December 2017 Clemson, SC
HF RESEARCH INSTITUTE TRAVEL GRANT RECIPIENT Clemson University	February 2017 Clemson, SC
UPSILON PIE EPSILON (UPE) INDUCTEE International Honor Society for the Computing and Information Disciplines, Clemson University	April 2016 Clemson, SC
AWARDED BEST VIRTUAL REALITY DEMO Virtual Reality Systems Course, Clemson University	December 2015 Clemson, SC
INCLUDED ON PRESIDENT'S LIST Clemson University	May 2013 Clemson, SC

EXTERNAL SERVICES

CO-GUEST EDITOR

- Frontiers in Virtual Reality and Human Behavior – The Light and Dark Sides of Virtual Reality

JOURNAL REVIEWER

- Frontiers in Virtual Reality and Human Behavior
- IEEE Transactions on Visualization and Computer Graphics
- Springer Virtual Reality

CONFERENCE REVIEWER

- ACM CHI PLAY (2021)
- ACM Symposium on Applied Perception (2020)
- IEEE Conference on Virtual Reality and 3D User Interfaces (2020, 2021)
- International Symposium on Visual Computing (2018, 2019, 2020, 2021)

RESEARCH DEMONSTRATIONS CHAIR

- IEEE Conference on Virtual Reality and 3D User Interfaces (2020, 2021, 2022)

WEB CHAIR

- IEEE Conference on Virtual Reality and 3D User Interfaces (2016, 2017, 2018)

STUDENT VOLUNTEER

- IEEE Conference on Virtual Reality and 3D User Interfaces (2019)

WEB ADMIN

Virtual Environments Group
School of Computing, Clemson University

August 2013 – December 2019
Clemson, SC

PUBLICATIONS

PEER-REVIEWED JOURNAL PUBLICATION(S)

1. **Bhargava, A.**, Venkatakrishnan, R., Venkatakrishnan, R., Solini, H., Lucaites, K. M., Robb, A., ... & Babu, S. (2021, May). "Did I Hit the Door? Effects of Self-Avatars and Calibration in a Person-Plus-Virtual-Object System on Perceived Frontal Passability in VR." *IEEE Transactions on Visualization and Computer Graphics*.
2. Lucaites, K. M., Venkatakrishnan, R., **Bhargava, A.**, Venkatakrishnan, R., & Pagano, C. C. (2020). "Predicting aperture crossing behavior from within-trial metrics of motor control reliability." *Human Movement Science*, 74, 102713.
3. Solini, H.M., **Bhargava, A.**, Pagano, C.C. (2020). "The effects of testing environment, experimental design, and ankle loading on calibration to perturbed optic flow during locomotion." *Attention, Perception, & Psychophysics*
4. **Bhargava, A.**, Lucaites, K.M., Hartman, L.S., Solini, H., Bertrand, J.W., Robb, A.C., Pagano, C.C. and Babu, S.V (2020). "Revisiting Affordance Perception in Contemporary Virtual Reality", *Springer Virtual Reality*, pp.1-12.
5. Lucaites, K.M., Venkatakrishnan, R., Venkatakrishnan, R., **Bhargava, A.** and Pagano, C.C. (2020). "Predictability and Variability of a Dynamic Environment Impact Affordance Judgments", *Ecological Psychology*, pp.1-20.
6. **Bhargava, A.**, Martin, J. and Babu, S.V., (2019). "Comparative Evaluation of User Perceived Quality Assessment of Design Strategies for HTTP-based Adaptive Streaming." *ACM Transactions on Applied Perception (TAP)*, 16(4), p.22.
7. **Bhargava, A.**, Bertrand, J.W., Gramopadhye, A.K., Madathil, K.C. and Babu, S.V., (2018). *Evaluating multiple levels of an interaction fidelity continuum on performance and learning in near-field training simulations.* " *IEEE transactions on visualization and computer graphics*, 24(4), pp.1418-1427. (**<13% acceptance rate**)

CONFERENCE PROCEEDING(S)

8. Siqueira, A., **Bhargava, A.**, Venkatakrishnan, R., Venkatakrishnan, R., Lucaites, K., Solini, H., Nasiri, M., Robb, C.R., Pagano, C.C., Ullmer, B., Babu, S.V. (2021, March). "Empirically Evaluating the Effects of Perceptual Information Channels on Size Perception of Tangibles in Near-field Virtual Reality." In 2021 IEEE Conference on Virtual Reality and 3D User Interfaces (VR). IEEE. Lisbon, Portugal
9. Gomes de Siqueira, A., Bhargava, A., Venkatakrishnan, R., & Venkatakrishnan, R. (2021, February). "PPCards: Toward Enhancing Electronic Prototyping with Editions of a Card-based Platform." In Proceedings of the Fifteenth International Conference on Tangible, Embedded, and Embodied Interaction (pp. 1-11). (**Honorable mention**)
10. **Bhargava, A.**, Solini, H., Lucaites, K., Bertrand, J.W., Robb, A., Pagano, C.C. and Babu, S.V. (2020, March). "Comparative Evaluation of Viewing and Self-Representation on Passability Affordances to a Realistic Sliding Doorway in Real and Immersive Virtual Environments." In 2020 IEEE Conference on Virtual Reality and 3D User Interfaces (VR). IEEE. Atlanta, Georgia (**Nominated for best paper**)
11. Venkatakrishnan, R., Venkatakrishnan, R., **Bhargava, A.**, Lucaites, K., Solini, H., Volonte, M., Robb, A.C., Lin, W.C., Lin, Y.X. and Babu, S.V. (2020, March). "Comparative Evaluation of the Effects of Motion Control on Cybersickness in Immersive Virtual Environments." In 2020 IEEE Conference on Virtual Reality and 3D User Interfaces (VR). IEEE. Atlanta, Georgia

12. Lucaites, K., Venkatakrishnan, R., Venkatakrishnan, R., **Bhargava, A.**, & Pagano, C. (2019). "Perceptions of Passability Through Dynamically Moving Gaps." Proceedings of the Human Factors and Ergonomics Society Annual Meeting, 63(1).
13. Lucaites, K., Venkatakrishnan, R., **Bhargava, A.**, Venkatakrishnan, R., & Pagano, C. (2019). "Using nonlinear analyses to measure characteristics of motor control used during action scaling." In L. van Dijk & R. Withagen (Eds.). Studies in Perception & Action. XV. New York: Taylor and Francis Group.
14. Solini, H.M., **Bhargava, A.**, Pagano, C. C. (2019, October). "Transfer of Calibration in Virtual Reality to both Real and Virtual Environments." In Proceedings of the Human Factors and Ergonomics Society Annual Meeting (Vol. 63, No. 1). Sage CA: Los Angeles, CA: SAGE Publications.
15. Venkatakrishnan, R., **Bhargava, A.**, Volonte, M., Solini, H., Venkatakrishnan, R., Robb, A.C., Babu, S.V., Lucaites, K.M. and Pagano, C., (2019, March). "Towards an Immersive Driving Simulator to Study Factors Related to Cybersickness" (Poster). In 2019 IEEE Conference on Virtual Reality and 3D User Interfaces (VR) (pp. 1201-1202). IEEE.
16. **Bhargava, A.**, Lucaites, K.M., Hartman, L.S., Solini, H., Bertrand, J.W., Robb, A.C., Pagano, C.C. and Babu, S.V., (2018, March). "Towards Revisiting Passability Judgments in Real and Immersive Virtual Environments" (Poster). In 2018 IEEE Conference on Virtual Reality and 3D User Interfaces (VR) (pp. 513-514). IEEE
17. Brickler, D., Babu, S.V., Bertrand, J. and **Bhargava, A.**, (2018, March). "Towards Evaluating the Effects of Stereoscopic Viewing and Haptic Interaction on Perception Action Coordination" (Poster). In 2018 IEEE Conference on Virtual Reality and 3D User Interfaces (VR) (pp. 1-516). IEEE.
18. Scharett, E., Lopes, S., Rogers, H., **Bhargava, A.**, Ponathil, A., Madathil, K.C. and Dye, C., (2017, September). "An Investigation of Information Sought by Caregivers of Alzheimer's Patients on Online Peer-Support Groups." In Proceedings of the Human Factors and Ergonomics Society Annual Meeting (Vol. 61, No. 1, pp. 1773-1777). Sage CA: Los Angeles, CA: SAGE Publications.
19. **Bhargava, A.**, Bertrand, J. and Babu, S.V., (2017, March). "AACT: A mobile Augmented Reality application for Art Creation." In 2017 IEEE Symposium on 3D User Interfaces (3DUI) (pp. 254-255). IEEE
20. Bertrand, J., **Bhargava, A.**, Madathil, K.C., Gramopadhye, A. and Babu, S.V., (2017, March). "The effects of presentation method and simulation fidelity on psychomotor education in a bimanual metrology training simulation." In 2017 IEEE Symposium on 3D User Interfaces (3DUI) (pp. 59-68). IEEE. (**<30% acceptance rate**)

INVITED TALKS

- Federal University of Uberlândia, Brazil December 2020
Title: *Affordance Perception in Virtual Reality* Virtual
- **Keynote:** Workshop on Collaborations with Domain Experts for Virtual Agent Research October 2020
Title: *Interdisciplinary Collaboration in VR Research* Virtual
- Games for Change Festival July 2020
Title: *PlayTest: Evaluating VR to Create Change* Virtual
- 27th IEEE Conference on Virtual Reality and 3D User Interfaces March 2020
Title: *Comparative Evaluation of Viewing and Self-Representation on Passability Affordances to a Realistic Sliding Doorway in Real and Immersive Virtual Environments* Atlanta, GA/
Virtual
- Visual Computing Lunchers Seminar at School of Computing, Clemson University February 2019
Title: *Understanding the Effects of Motion Control on Cybersickness in Immersive Virtual Environments* Clemson, SC
- Virtual Environments Group Seminar at School of Computing, Clemson University February 2019
Title: *Empirical Evaluation of the Effects of Body-Scaled Self-Avatars on Passability Judgments in Contemporary Virtual Reality* Clemson, SC

- Visual Computing Lunchers Seminar at School of Computing, Clemson University
Title: *Empirical Evaluation of the Effects of Body-Scaled Self-Avatars on Passability Judgments in Contemporary Virtual Reality* November 2018
Clemson, SC
- Virtual Environments Group Seminar at School of Computing, Clemson University
Title: *Empirical Evaluation of the Effects of Body-Scaled Self-Avatars on Passability Judgments in Contemporary Virtual Reality* April 2018
Clemson, SC
- Visual Computing Lunchers Seminar at School of Computing, Clemson University
Title: *Revisiting Size and Distance Estimations in Virtual Reality* April 2018
Clemson, SC
- **Tutorial:** 25th IEEE Conference on Virtual Reality and 3D User Interfaces
Title: *Tangibles within VR: Tracking, Augmenting, and Combining Fabricated and Commercially Available Commodity Devices* March 2018,
Germany
- **Demo:** 12th IEEE Symposium on 3D User Interfaces
Title: *AACT: A mobile Augmented Reality application for Art Creation* March 2017
Los Angeles, CA
- School of Computing Seminar, Clemson University
Title: *Comparative Evaluation of User Perceived Quality Assessment of Design Strategies for HTTP-Based Adaptive Streaming* October 2016
Clemson, SC
- Virtual Environments Group Seminar at School of Computing, Clemson University
Title: *Cybersickness: What Is It and What Causes It* September 2016
Clemson, SC
- Networking Seminar at School of Computing, Clemson University
Title: *User Perceived Quality Assessment of Design Strategies for HTTP-Based Adaptive Streaming* September 2015
Clemson, SC

SPONSORED RESEARCH

"The Effect of Anthropometric Properties of Self-Avatars on Action Capabilities in Virtual Reality" August 2019 – December 2019
 Doctoral Dissertation Completion Grant (\$ 20,300) Clemson, SC
 Clemson University

SKILLS

Programming Languages

C#	Java	HTML / CSS	Bootstrap
C / C++	PHP	JavaScript	D3.js
Python	MySQL	JQuery	ReactJS
OpenGL	XML		

Development/Design Tools

Unity	Maya	Jira	Adobe Photoshop
Vuforia	Blender	Confluence	Adobe XD
Mixamo	Microsoft Visual Studio	Bitbucket	Gatsby
Adobe Fuse	GIMP	Git	LaTeX

CMS/Frameworks

WordPress	Cascade	Jekyll	Gatsby
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Analysis

SPSS	MatLab
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