

Wallace S. Lages

HUMAN-COMPUTER INTERACTION · MIXED REALITY

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Education

Ph.D. in Computer Science

VIRGINIA TECH (VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY)

- Dissertation: Walk-Centric User Interfaces for Mobile Augmented Reality
- Thesis Advisor: Dr. Doug Bowman, Virginia Tech
- Thesis Committee: Dr. Nicholas Polys, Dr. Joseph Gabbard, Dr. Chris North, and Dr. Tobias Höllerer
- Research assistantship funded by the US Office of Naval Research

Blacksburg, United States

Aug. 2014 - Aug. 2018

M.S. in Computer Science

UFMG (UNIVERSIDADE FEDERAL DE MINAS GERAIS)

- Dissertation: A Parallel Architecture for Rendering Multiple Points of View
- Dissertation Advisor: Dr. Dorgival Olavo Guedes, Universidade Federal de Minas Gerais
- Dissertation Committee: Dr. Joao Luiz Elias Campos, Dr. Marcelo Walter
- CAPES Fellowship (Brazilian Federal Agency for Higher Education)

Belo Horizonte, Brazil

Mar. 2006 - Dec. 2008

B.S. in Computer Science

UFMG (UNIVERSIDADE FEDERAL DE MINAS GERAIS)

- Senior Project: Using IP Cameras in Computer Vision
- Advisor: Dr. Mario Montenegro Campos
- CNPq Fellowship (Brazilian National Council for Scientific and Technological Development)

Belo Horizonte, Brazil

Mar. 2002 - Dec. 2005

B.S. in Electrical Engineering (incomplete)

UFMG (UNIVERSIDADE FEDERAL DE MINAS GERAIS)

Belo Horizonte, Brazil

Mar. 1998 - Mar. 2002

Electronics Technician

UFMG (UNIVERSIDADE FEDERAL DE MINAS GERAIS)

Belo Horizonte, Brazil

Mar. 1994 - Dec. 1996

Appointments

Assistant Professor

SCHOOL OF VISUAL ARTS, VIRGINIA TECH

- Faculty of the Creative Technologies Program
- Fellow, Institute for Creativity, Arts, and Technology
- Member, Center for Human-Computer Interaction

Blacksburg, United States

2018 - Present

Assistant Professor

DEPARTMENT OF COMPUTER SCIENCE, VIRGINIA TECH

- Courtesy Appointment

Blacksburg, United States

2019 - Present

Member - College Honorifics Committee

COLLEGE OF ARCHITECTURE AND URBAN STUDIES, VIRGINIA TECH

- Representative of the School of Visual Arts.
- Decision on College Awardees.

Blacksburg, United States

2020 - Present

Member - Diversity and Inclusion Committee

SCHOOL OF VISUAL ARTS, VIRGINIA TECH

- Representative of the School of Visual Arts.

Blacksburg, United States

2020 - Present

Member - College Curriculum Committee

COLLEGE OF ARCHITECTURE AND URBAN STUDIES, VIRGINIA TECH

- Representative of the School of Visual Arts.
- Review of college course and program proposals.

Blacksburg, United States

2019 - Present

Member - Creativity + Innovation Destination Area

COLLEGE OF ARCHITECTURE AND URBAN STUDIES, VIRGINIA TECH

- Representative of the School of Visual Arts.
- Destination Area Programs and Activities

Blacksburg, United States

2019 - Present

Assistant Professor

SCHOOL OF FINE ARTS, UFMG

- Tenured-equivalent position obtained in 2014
- On leave from fall 2014 to 2018

Belo Horizonte, Brazil

2010 - 2018

Director - Digital Production Laboratory

SCHOOL OF FINE ARTS, UFMG

- Responsible for lab administration and operations

Belo Horizonte, Brazil

Mar. 2013 - Jul. 2014

Member - Undergraduate Research Evaluation Committee

SCHOOL OF FINE ARTS, UFMG

- Approved proposals for undergraduate research projects
- Selected projects for undergraduate research awards

Belo Horizonte, Brazil

Mar. 2010 - Jul. 2014

Assistant Director - Laboratory for Research and Experimentation

RODRIGO MELO FRANCO DE ANDRADE FOUNDATION

- Mentored undergraduate and graduate students
- Assisted with lab administration and operations

Belo Horizonte, Brazil

Mar. 2011 - Jul. 2014

Chair - Infrastructure Committee

ANIMATED CINEMA AND DIGITAL ARTS PROGRAM, UFMG

- Committee responsible for managing program facilities.

Belo Horizonte, Brazil

Mar. 2012 - Dec. 2013

Interim Chair - Department Photography, Performing Arts, and Cinema

SCHOOL OF FINE ARTS, UFMG

- Chairing department executive committee
- Overseeing processes of promotion, leave, and sub-committees
- Overseeing the use of departmental facilities

Belo Horizonte, Brazil

Jul. 2010 - Jun. 2012

Research Experience

Principal Investigator - Reality Design Studio

SCHOOL OF VISUAL ARTS, VIRGINIA TECH

- Research on virtual reality, augmented reality, and digital games

Blacksburg, United States

2018 - present

Graduate Research Assistant

DEPARTMENT OF COMPUTER SCIENCE, VIRGINIA TECH

- 3DI group, Center for Human-Computer Interaction
- Advisor: Dr. Doug Boman
- Research on interaction techniques, augmented and virtual reality

Blacksburg, United States

2014 - 2018

Co-Principal Investigator - 1maginari0

DEPARTMENT OF PHOTOGRAPHY, PERFORMING ARTS, AND CINEMA, UFMG

- PI: Dr. Francisco Marinho
- Research on interactive digital art and digital games

Belo Horizonte, Brazil

2010 - 2014

Graduate Research Assistant

SCHOOL OF ARCHITECTURE, UFMG

- PI: Dr. Maria Lucia Mallard
- Research and development of a low-cost virtual reality CAVE for architectural instruction

Belo Horizonte, Brazil

Oct. 2006 - Jan. 2009

Undergraduate Research Assistant - VerLab

DEPARTMENT OF COMPUTER SCIENCE, UFMG

- Advisor: Dr. Mario Campos
- SensorNet Project - Mobile robotics research: hardware, software, and firmware development

Belo Horizonte, Brazil

Jan. 2004 - Jan. 2005

Student Lead - RAST - Student Radioastronomy Group

DEPARTMENT OF PHYSICS, UFMG

- Advisor: Dr. Wagner Corradi
- Design and development of an C-band amateur radio telescope

Belo Horizonte, Brazil

Jan. 2002 - Feb. 2003

Industry Experience

Founder, COO, and board member

ILUSIS INTERACTIVE GRAPHICS

- Strategic planning
- Proposal development
- Led research and development activities

Belo Horizonte, Brazil

2006 - 2014

Freelance Software Developer

HOLDLINE AUDIO TECNOLOGIA

- Firmware development for a micro controlled telephony system
- Software architecture design, criptography and network routines.

Belo Horizonte, Brazil

Mar. 2001 - Apr. 2001

Founder, Disturbio Software Interativo

FUNDACAO MINEIRA DE SOFWARE, CENTER FOR ENPRENEURSHIP

- Engine code for character animation and scene editing
- Managed the development team (2 programmers, 3 artists)

Belo Horizonte, Brazil

Feb. 2000 - Jun. 2001

Software Developer, Aluminum Division

ATAN SISTEMAS DE AUTOMACAO (NOW ACCENTURE)

- Developed a remote terminal unity simulator in QNX
- Graphic interface developer

Belo Horizonte, Brazil

Feb. 1997 - Dec. 1999

Producer and Software Developer

VIRSAT SISTEMAS

- Managed the development team of a PC game

Belo Horizonte, Brazil

Oct. 2006 - Jan. 2007

Sponsored Research and Other Grant Awards

Sponsored Research - External Funding

- Divya Srinivasan (PI), Alan Asbeck (Co-PI), S. Ge, W. Kim, Nathan Lau (Co-PI), Alex Leonessa (Co-PI), M. Nussbaum (Co-PI), and Wallace S. Lages. FW-HTF Theme 2: enabling the functional use of powered exoskeletons for industrial applications and understanding the socioeconomic consequences of exoskeleton technology application. National Science Foundation. 09/15/2018 to 08/31/2023. USD 2,981,870. Responsible for \$14,284.
- Elham Morshedzadeh (PI), Andre Muelenaer (Co-PI), Wallace S. Lages (Co-PI), B. Arena (Co-PI), and S. Parker (Co-PI). Designing an interactive training system for pediatric telemedicine cart operations incorporating augmented reality. National Institutes of Health. 01/02/2021 to 01/06/2022. USD 45,165. Responsible for 5% (\$2,500). - New
- Wallace Santos Lages (PI). Exploring emotion and spatial presence in ar storytelling. Snap Creative Challenge Award. 01-10-2020. USD 10,000. Responsible for 100%.
- Wallace Santos Lages (co PI), Doug Bowman (co PI), and Blair Macintyre (co PI). Content management for always-on augmented reality interfaces. Google's AR/VR Research Awards. 22-01-2019 to 12-11-2019. USD 142,802. Responsible for 29% (\$41,133).

Sponsored Research - Virginia Tech Internal Funding

- Wallace S. Lages (PI) and Chris North. An immersive analytics framework for drone-collected environmental data. Center for Human-Computer Interaction Planning Grant. 3/12/2021 to 12/31/2021. USD 7,076 Responsible for 80% (\$5,660).-New
- Wallace S. Lages (PI), Ryan Patton, and Yotam Gingold. Collaboration on virtual reality programming environments. 4-VA Research Grant. 3/12/2020 to 12/31/2021. USD 34,998. Responsible for 71% (\$24,998).
- Wallace S. Lages (PI), Phat Nguyen, and Alex Leonessa. Using robotic platforms to provide large scale haptics in virtual reality. Virginia Tech ICAT SEAD Grant. 07/2019 to 08/2020. USD 25,000. Responsible for 100% (\$25,000).
- Wallace S. Lages (PI) and T. Oogle. Field dependency and implications to virtual environments. Virginia Tech ICAT Mini SEAD Grant. 10/2019 to 05/2020. USD 3,000. Responsible for 100% (\$3,000).

- Justin Perkinson (PI), Wallace S. Lages, and Phat Nguyen. Next-level vr: Integrating live-action 3d humans into synthetic environments in real time. Virginia Tech ICAT Mini SEAD Grant and CHCI. 01/2019 to 05/2019. USD 4,000. Responsible for 33% (\$1,133).
- Wallace S. Lages and Mahdi Nabiyouni. Krinkle cube. Virginia Tech ICAT Student SEAD Grant. 01/2017 to 05/2017. USD 500.

Other Grant Awards

- Wallace S. Lages (Co-PI), Meaghan Dee (Co-PI), and Phat Nguyen (Co-PI). Virginia tech nasa s.u.i.t.s. challenge. 8/1/2018 to 05/31/2019. Department of Computer Science, Institute of Creative Arts and Technologies, Office for Undergraduate Research. USD 12,500. Responsible for 50% (\$6,250).
- Wallace S. Lages (Co-PI). New faculty mentoring grant. 3/11/2019 to 05/01/2021. Virginia Tech, Office of Provost. USD 1,500.
- Wallace S. Lages (Co-PI). Reality boundary studio - 3/01/2021 to 12/01/2021. Creativity + Innovation Destination Area. USD 1,500.
- Wallace S. Lages (Co-PI). Virginia tech hokienauts. 11/01/2020. Department of Computer Science, Office for Undergraduate Research. USD 2,800.
- Wallace Santos Lages. Natural control of animated photorealistic characters. FINEP - Brazilian Funding Authority for Studies and Projects. 01-01-2014 to 12-11-2017. USD 470,000. Ilusis Interactive Graphics.
- Wallace Santos Lages. Using time of flight cameras for robust tracking. FAPEMIG - Fundação de Amparo à Pesquisa do Estado de Minas Gerais. 01-01-2010 to 12-11-2012. USD 28,444. Ilusis Interactive Graphics.

Research and Creative Activities

Awards, Prizes, and Recognitions

- **W. S. Lages** (original storyline, technology development), J. Perkinson (script and direction), P. Nguyen (3D modelling). Live Action VR. *Board Choice Award*. Creativity + Innovation Day, may 2020.
- **W. S. Lages** (design and development), D. A. Bowman (design). An Adaptive Interface for Spatial Augmented Reality Workspaces. *Best Demo Award*. 7th ACM Symposium on Spatial User Interaction, october 2019.
- **W. S. Lages**, M. Dee, P. Nguyen. Virginia Tech Hokienauts. NASA Spacesuit User Interface Technologies for Students, december 2018.
- **W. S. Lages**, Second Place. uDev Challenge. Usens Inc. 2017.
- **W. S. Lages**, Winner JogosBR Contents 2006. Brazilian Ministry of Culture / Abragames. 2006.
- **W. S. Lages**, Finalist. Idea to Product Lating America. Fundacao Getulio Vargas, The University of Texas at Austin. Best 4 Business Plans. 2008.
- **W. S. Lages**, Semi-Finalist. GV-Intel Challenge 2008. Fundacao Getulio Vargas / Intel Capital. Best 16 Business Plan. 2008.

Papers in Refereed Journals (both print and electronic)

Star* indicates a student advised. plus+ indicates the presenter.

- Anthony Steed, Tuukka M Takala, Daniel Archer, Wallace Lages, and Robert W Lindeman. Directions for 3d user interface research from consumer vr games. *IEEE Transactions on Visualization and Computer Graphics*, October 2021. doi: [10.1109/TVCG.2021.3106431](https://doi.org/10.1109/TVCG.2021.3106431)
- Wallace S. Lages and Doug A. Bowman. Move the object or move myself? walking vs. manipulation for the examination of 3d scientific data. *Frontiers in Information and Communication Technology (Frontiers in ICT)*, 5, Jul 2018. doi: [10.3389/fict.2018.00015](https://doi.org/10.3389/fict.2018.00015)
- Alessandro .R.D. Silva, Wallace S. Lages, and Luiz Chaimowicz. Boids that see: Using self-occlusion for simulating large groups on gpus. *ACM Computers in Entertainment (CIE)*, 7(4):1–20, 2009. URL <https://doi-org.ezproxy.lib.vt.edu/10.1145/1658866.1658870>
- Wallace Lages, Carlucio Cordeiro, and Dorgival Guedes. Performance analysis of a parallel multi-view rendering architecture using light fields. *The Visual Computer*, 25:947–958, Oct 2009. doi: [10.1007/s00371-009-0371-z](https://doi.org/10.1007/s00371-009-0371-z)

Papers in Refereed Conference Proceedings

Star* indicates a student advised. plus+ indicates the presenter.

- Samat Imamov*, Daniel Monzel*, and Wallace Lages+. Where to display? how interface position affects comfort and task switching time on glanceable interfaces. In *2020 IEEE Conference on Virtual Reality and 3D User Interfaces (VR)*, pages 851–858, Mar 2020. doi: [10.1109/VR46266.2020.00012](https://doi.org/10.1109/VR46266.2020.00012)
- Wallace Lages, Yuan Li+, Lee Lisle, Tobias Höllerer, and Doug Bowman. Enhanced geometric techniques for point marking in model-free augmented reality. In *2019 IEEE International Symposium on Mixed and Augmented Reality (ISMAR)*, pages 301–309. IEEE, 2019

- Yuan Li⁺, Feiyu Lu, Wallace S Lages, and Doug Bowman. Gaze direction visualization techniques for collaborative wide-area model-free augmented reality. In *2019 ACM Symposium on Spatial User Interaction (SUI)*, New York, NY, USA, 2019. Association for Computing Machinery. doi: [10.1145/3357251.3357583](https://doi.org/10.1145/3357251.3357583)
- Armaghan Behzad Behbahani⁺, Wallace S. Lages, and Aisling Kelliher. A multisensory design probe: An approach for reducing technostress. In *Proceedings of the Thirteenth International Conference on Tangible, Embedded, and Embodied Interaction*, TEI '19, pages 459–466, New York, NY, USA, 2019. ACM. doi: [10.1145/3294109.3300992](https://doi.org/10.1145/3294109.3300992)
- Wallace S. Lages⁺ and Doug A. Bowman. Walking with adaptive augmented reality workspaces: Design and usage patterns. In *Proceedings of the 24th International Conference on Intelligent User Interfaces*, IUI '19, pages 356–366, New York, NY, USA, 2019. ACM. doi: [10.1145/3301275.3302278](https://doi.org/10.1145/3301275.3302278)
- Run Yu⁺, Wallace Santos Lages, Mahdi Nabiyouni, Brandon Ray, Navyaram Kondur, Vikram Chandrashekar, and Doug A. Bowman. Bookshelf and bird: Enabling real walking in large vr spaces through cell-based redirection. In *2017 IEEE Symposium on 3D User Interfaces (3DUI)*, IEEE Symposium on 3D User Interfaces, pages 116–119. Los Angeles, CA, IEEE, Jan 2017. URL <http://ieeexplore.ieee.org/document/7893327/>
- Wallace Lages⁺, Carlucio Cordeiro, and Dorgival Guedes. A parallel multi-view rendering architecture. In *SIBGRAPI 2008: XXI Brazilian Symposium on Computer Graphics and Image Processing*, SIBGRAPI - Brazilian Symposium on Computer Graphics and Image Processing, pages 270–277. Campo Grande, BRAZIL, IEEE COMPUTER SOC, Jan 2008. doi: [10.1109/SIBGRAPI.2008.41](https://doi.org/10.1109/SIBGRAPI.2008.41)
- Alessandro R. da Silva⁺, Wallace S. Lages, and Luiz Chaimowicz. Improving boids algorithm in gpu using estimated self occlusion. In *Proceedings of SBGames' 08: VII Brazilian Symposium on Games and Digital Entertainment*, pages 41–46. SBC, 2008
- Leonardo Arantes, Alexandre Dubiela, Paulo Magalhaes, and Wallace Lages⁺. O projeto visual do jogo peixis. In *Proceedings of SBGames' 07: VI Brazilian Symposium on Games and Digital Entertainment*. SBC, 2007
- Wallace Santos Lages, A. Ivanenko Salgado⁺, A Vilas-Boas, C Megale Leite, A Haibara, T Mota, J Henriques Silva, J Carvalho Tavares, G Avelar, M Gino, F Marinho, F Fernandino, and P Gobira. Construction of an interactive space of life sciences: finding a way through the difficult dialogue between scientists and artists, May 2014

Performances, Exhibitions, Compositions

- Wallace S. Lages, Hiromi Okumura, Claire Constantikes, and George Tatum. Between earth and air. Simply Elemental, 01 August - 30 September 2019. Juried group exhibition.
- Wallace Santos Lages. Datasphinx. SOVA Faculty Triennial Exhibition, 04 April 2019. Invitational group exhibition.
- Wallace Santos Lages. Multiple realities. XXI Generative Art Conference, 20 Dec 2018. Juried Stage performance.
- Wallace Santos Lages, Pablo Gobira, and Francisco Marinho. Better hands. ACM Creativity and Cognition Art Exhibition., 27 Jun - 30 Jun 2017. Robotic artwork. Juried group exhibition.
- Kairan Gandhi, Marilia Bergamo, Jalver Bethonico, Pablo. Gobira, and Wallace Santos Lages. Coração. Espaço Interativo de Ciências da Vida - Inaugural Exhibition, 2013. Interactive artwork. Invitational group exhibition.
- Wallace Santos Lages. Trem de cataguases. 43 UFMG Winter Art Festival., 2011. Interactive Projection. Invitational group exhibition.
- Francisco Marinho, Alessandro Ribeiro da Silva, and Wallace Santos Lages. Mesa interativa da vale. Vale Itinerant Exhibition. Interactive table. Invitational group exhibition.
- Francisco Marinho and Lages Wallace S. Fire. Bienal Zero – Bienal Universitária de Arte. Interactive installation. Invitational group exhibition.
- Francisco Marinho, Wallace Santos Lages, and A. R. da Silva. Piracema. Inaugural Exhibition, Espaço Israel Pinheiro. Digital projection. Invitational group exhibition.
- Stephani Clear and Wallace S. Lages. Visual poems. 43 UFMG Winter Art Festival. Interactive Installation. Invitational group exhibition.

Refereed Papers and Posters presented a Professional Meetings

Star* indicates a student I advised. plus⁺ indicates the presenter.

- Wallace Lages⁺. Opportunities and challenges in immersive entertainment. In *20th Brazilian Symposium on Computer Games and Digital Entertainment, GrandBR Forum*. SBC, 2021
- Nanlin Sun⁺⁺, Annette Feng, Ryan Patton, Yotam Gingold, and Wallace Lages. Programmable virtual reality environments. In *2021 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW)*, pages 619–620. IEEE, 2021
- Yuan Li⁺⁺, David Hicks, Wallace S. Lages, Sang Won Lee, Akshay Sharma, and Doug A Bowman. Arcritique: Supporting remote design critique of physical artifacts through collaborative augmented reality. In *2021 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW)*, pages 585–586. IEEE, 2021
- Anjali Sapra⁺⁺ and Wallace S Lages. Leveraging ar and object interactions for emotional support interfaces. In *2021 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW)*, pages 667–668. IEEE, 2021

- Wallace S Lages. The immersive living room. In *CSCW The Future of Social AR Workshop*. ACM Computer Supported Cooperative Work (Workshop Paper), October 2020
- Leonardo Pavanatto⁺, Feiyu Lu^{*}, Shakiba Davari^{*}, Emily Harris^{*}, Anthony Folino^{*}, Samat Imamov^{*}, Satvik Chekuri^{*}, Leslie Blustein^{*}, Wallace S. Lages, and Doug A. Bowman. Get the job! an immersive simulation of sensory overload. In *2020 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW)*, pages 509–510. IEEE, 2020
- Wallace Lages⁺ and Doug Bowman. Adjustable adaptation for spatial augmented reality workspaces. In *ACM Symposium on Spatial User Interaction (SUI)*, New York, NY, USA, 2019. Association for Computing Machinery. doi: [10.1145/3357251.3358755](https://doi.org/10.1145/3357251.3358755)
- Wallace Lages⁺ and Doug Bowman. An adaptive interface for spatial augmented reality workspaces. In *ACM Symposium on Spatial User Interaction (SUI)*, New York, NY, USA, 2019. Association for Computing Machinery. doi: [10.1145/3357251.3360005](https://doi.org/10.1145/3357251.3360005)
- W. S. Lages. Exploring artistic multi-agent systems. In C Soddu and E Colabella, editors, *Proceedings of the XXI Generative Art Conference*, pages 368–375. Verona, Italy, Domus Argenia, Dec 2018
- Y Li⁺, R Yu, L Zhang, W. S. Lages, and D. A. Bowman⁺. Climb, direct, stack: Smart interfaces for e-league contest. In *2018 IEEE Conference on Virtual Reality and 3D User Interfaces (VR)*, pages 852–853, Mar 2018. doi: [10.1109/VR.2018.8446131](https://doi.org/10.1109/VR.2018.8446131)
- W. S. Lages⁺, Y Li, and D. A. Bowman. Evaluation of environment-independent techniques for 3d position marking in augmented reality. In *2018 IEEE Conference on Virtual Reality and 3D User Interfaces (VR)*, pages 615–616, Mar 2018. doi: [10.1109/VR.2018.8446055](https://doi.org/10.1109/VR.2018.8446055). 2 citations (04/2020)
- Wallace S. Lages. Walk-centric user interfaces. In *2018 IEEE Conference on Virtual Reality and 3D User Interfaces (VR)*, pages 825–826, Mar 2018. doi: [10.1109/VR.2018.8446426](https://doi.org/10.1109/VR.2018.8446426)
- Wallace Santos Lages⁺, Pablo Gobira, and Francisco Marinho. Structural coupling on creative interfaces. In *Proceedings of the 2017 ACM SIGCHI Conference on Creativity and Cognition*, pages 252–256. Singapore, ACM, Jun 2017. doi: [10.1145/3059454.3078860](https://doi.org/10.1145/3059454.3078860)
- Wallace Santos Lages⁺, Gustavo A. Arango, David H. Laidlaw, John J. Socha, and Doug A. Bowman. Designing capsule, an input device to support the manipulation of biological datasets. In BH Thomas, R Lindeman, and M Marchal, editors, *2016 IEEE Symposium on 3D User Interfaces (3DUI)*, pages 255–256, Greenville, SC, Jan 2016. IEEE. URL <https://ieeexplore.ieee.org/abstract/document/7460067/>
- Wallace Santos Lages⁺, Bireswar Laha, Wesley Miller, Johannes Novotny, John J. Socha, David H. Laidlaw, and Doug A. Bowman. Effects of field of regard and stereoscopy and the validity of mr simulation for visual analysis of scientific data. In T Hollerer, V Interrante, A Lecuyer, and E Suma, editors, *2016 IEEE Conference on Virtual Reality (VR)*, Proceedings of the IEEE Virtual Reality Annual International Symposium, pages 215–216. Greenville, SC, IEEE, Jan 2016. URL <https://ieeexplore.ieee.org/document/7504730/>
- Wallace Santos Lages⁺, Mahdi Nabiyouni, and Leonardo Arantes. Krinkle cube - a collaborative vr game using natural interaction. In *CHI PLAY 2016: Proceedings of the Annual Symposium on Computer-Human Interaction in Play Companion*, pages 189–196, Austin, TX, Jan 2016. ASSOC COMPUTING MACHINERY. doi: [10.1145/2968120.2987746](https://doi.org/10.1145/2968120.2987746)
- Wallace Lages. Ray, camera, action! a technique for collaborative 3d manipulation. In BH Thomas, R Lindeman, and M Marchal, editors, *2016 IEEE Symposium on 3D User Interfaces (3DUI)*, pages 281–282, Greenville, SC, Jan 2016. IEEE. URL <https://ieeexplore.ieee.org/abstract/document/7460080/>
- Kristen Hines⁺, Wallace Lages, Namitha Somasundaram, and Thomas Martin. Protecting workers with smart e-vest. In *Adjunct Proceedings of the 2015 ACM International Joint Conference on Pervasive and Ubiquitous Computing and Proceedings of the 2015 ACM International Symposium on Wearable Computers*, UbiComp/ISWC'15 Adjunct, pages 101–104, New York, NY, USA, 2015. ACM. doi: [10.1145/2800835.2800881](https://doi.org/10.1145/2800835.2800881). location: Osaka, Japan numpages: 4 acmid: 2800881 keywords: multimodal, notification interfaces, response time, wearable
- Wallace Lages⁺, Mahdi Nabiyouni, Javier Tibau, and Doug A. Bowman⁺. Interval player: Designing a virtual musical instrument using in-air gestures. In *2015 IEEE Symposium on 3D User Interfaces (3DUI)*, pages 203–204, Mar 2015. doi: [10.1109/3DUI.2015.7131771](https://doi.org/10.1109/3DUI.2015.7131771)

Oral Presentations

Star* indicates a student I advised. plus+ indicates a presenter.

- Wallace S. Lages⁺, Alexander Leonessa⁺, and Phat Nguyen⁺. Using robotic platforms to provide large scale haptics in virtual reality. ICAT Playdate, Moss Arts Center, Virginia Tech, Blacksburg, VA. January 29, 2021.
- Wallace S. Lages⁺, Justin Perkinson⁺, and Phat Nguyen⁺. Live action virtual reality. ICAT Playdate, Moss Arts Center, Virginia Tech, Blacksburg, VA. February 12, 2021.
- Wallace S. Lages⁺. Sentiments. ACM IMX, Creative Challenge Workshop, Barcelona, (online). June 17th, 2020.
- Wallace S. Lages⁺ and M. Dee⁺. Out of this world: An interdisciplinary team of students creates ar spacesuit designs for nasa. SECAC, Richmond, VA, (online). December 9th, 2020.
- Wallace S. Lages⁺, Justin Perkinson⁺, and Phat Nguyen⁺. Next-level vr: Integrating live-action 3d humans into synthetic environments in real time. LSIE Transdisciplinary Communities Research Symposium, Moss Arts Center, Blacksburg, VA. April 2, 2019.
- Wallace S. Lages⁺, Meaghan Dee⁺, Samat Imamov⁺⁺, Phat Nguyen⁺, Brady Blauvelt⁺⁺, Adi Sicar⁺⁺, David Haas⁺⁺, Lei Zhang^{*}, Emily Harris⁺⁺, Vina Shen^{*}, and Jim Singer^{*}. The virginia tech nasa s.u.i.t.s. Innovation and Creativity Day, Moss Arts Center, Blacksburg, VA. May 6, 2019.

- Wallace S. Lages, Phat Nguyen, Lei Zhang, Emily Harris, Vina Shen, and Jim Singer. The virginia tech nasa s.u.i.t.s. (spacesuit user interface technologies for students) design challenge team. ICAT Playdate, Moss Arts Center, Blacksburg, VA. April 12, 2019.
- Wallace S. Lages⁺, Justin Perkinson⁺, Phat Nguyen⁺, and Tianyu Ge^{*+}. Next-level vr: Integrating live-action 3d humans into synthetic environments in real time. Innovation and Creativity Day, Moss Arts Center, Blacksburg, VA. May 6, 2019.
- Wallace S. Lages⁺. Understanding the possible: Contributions from arts, science, and engineering. ICAT Playdate, Moss Arts Center, Virginia Tech, Blacksburg, VA. November 22, 2019
- Pablo Gobira⁺, Francisco Marinho, and Wallace Santos Lages. Artist talk: Better hands. International Symposium on Electronic Art (ISEA), 2017

Courses Developed

2021

ART 3504 / 5704 TS: Physical Computing - This course introduces the fundamental concepts of creating interactive physical systems using micro-controllers, sensors, actuators, and code.

2020

ART 3704 / 4504 TS: Advanced Creative Coding - This course introduces the fundamentals of real time 3D programming using the Unity3D game engine. It covers physics, character control, animation, 3D transforms, shading and sound.

ART 3504 TS: Introduction to Game Development - This course introduces the process involved in the development of digital games. It covers 3D asset creation, player input, physics, artificial intelligence, level design, and playtesting.

2018

ART 3504 / 5704 TS: Game Design - This course introduces the conceptual foundations of games (digital or otherwise). It covers theoretical frameworks and game design practice.

ART 3504 / 5704 TS: AR / VR - This course introduces fundamental concepts involved in the design of augmented reality (AR) and virtual reality (VR) experiences. It covers history and technology of mixed reality systems, human senses and perception, interaction techniques, and user experience aspects.

Teaching and Advising

Completed Graduate Committee Chair:

Eric Schoenborn - MFA Creative Technologies. Phenomenal Things. Examination Committee Chair. Defense date: 11-29-2021

Armi Behzad - MFA Creative Technologies. Designing for Reflection: Utilizing slow technology to create tangible interactive designs for reducing technostress. Examination Committee Chair. Defense date: 08-12-2019.

Completed Graduate Committee Member:

Nathaniel Llorens - MS Computer Science. Evaluating Collaborative Cues for Affinity Diagramming Tasks in Augmented Reality. Examination Committee Member. Defense date: 08-12-2021.

Tianyu Ge - MFA Creative Technologies. Encyclopædia Mundi: A digital Experience. Examination Committee Member. Defense date: 5-5-2021.

Shakiba Davari - MS Computer Science and Applications (non-thesis). Examination Committee Member. Defense date: 12/15/2020.

JooYoung Whang - MS Computer Science. Improving the Perception of Depth of Image-Based Objects in a Virtual Environment. Defense date: 6-26-2020.

Javier Tibau - PhD Computer Science. Exploring and Promoting Family Connections at a Distance Through FamilySong. Examination Committee Member. Defense date: 12-2-2019.

Mahshid Gorjian - MFA Creative Technologies. The Battle of the Kings. Examination Committee Member. Defense date: 06-28-2019.

Isabella Cerbino - BS in Digital Games. Proposicao de Mapeamento de Areas Irregulares em Realidade Virtual. Pontificia Universidade Catolica de Minas Gerais. Belo Horizonte, Brazil. Co-advisor of year-long capstone thesis. Defense Date: 06/21/2019. Chair: Dr. R. Motta.

Huy Ngo - MFA Creative Technologies. Muted Blue. Examination Committee Member. Defense date: 05-08-2019.

Completed Graduate Research Supervision:

Luke McCormick - MS Computer Science. Graduate research advisor. Project: Outdoor AR Interfaces (04-12-2021 to 12-31-2021)

Joe Conwell - MEng Computer Science. Research advisor. Project: Cybersickness Research (08-10-2020 to 05-15-2021)

Sara Moghaddam - PhD Architecture. Graduate research advisor. Project: Large Scale Haptics in VR (08-26-2019 to 09-01-2020). Dissertation Advisor: Jim Jones.

Daniel Monzel - MFA Creative Technologies. Graduate research advisor. Project: Ganceable AR Interfaces (26-08-2019 to 12-11-2019).

Tianyu Ge - MFA Creative Technologies. Graduate research advisor. Project: Live Action VR (01-22-2019 to 05-08-2019).

Completed Undergraduate Chair:

Emily Harris - BS Creative Technologies. Senior Studio Chair. Title: Eidolon (08-26-2019 to 05-05-2021)

David Riddel - BA Creative Technologies. Senior Studio Chair. Title: Persistence (08-26-2019 to 05-14-2020)

Completed Undergraduate Research Advising:

Minh Tran - BS Mechanical Engineering. Undergraduate research advisor. Project: VR Haptics (08-26-2019 to 05-15-2021)

Danny Faruqi - BS Computer Engineering. Undergraduate research advisor. Project: AR Telemedicine (05-24-2021 to 12-17-2021)

Esha Thomare - BS Computer Science. Undergraduate research advisor. Projects: VR Programming and AR Storytelling (01-19-2019 to 12-17-2021)

Anjali Sapra - BS Computer Science. Undergraduate research advisor. Projects: SpiderSense and AR Interfaces (08-26-2019 to 05-05-2021)

Samat Imamov - BS Computer Science, Undergraduate Research advisor. Project: Ganceable Interfaces for Augmented Reality (01-22-2019 - 05-06-2020).

Nanlin Sun - BS Computer Science. Undergraduate research advisor. Project: Large Scale Haptics in VR (08-26-2019 to 05-14-2020)

Robby Kurtz - BA Creative Technologies. Undergraduate research advisor. Project: Designing games for cooperation (08-26-2019 to 12-11-2019)

Samat Imamov - BS Computer Science. Undergraduate research advisor. Project: Ganceable AR Interfaces (01-22-2019 to 12-11-2019)

Current master's thesis advisees

Nanlin Sun - MS Computer Science. Graduate thesis advisor. Project: Virtual Reality Programming (08-10-2020 to present).

Cameron Moore - MS Computer Science. Graduate thesis advisor. Project: Travel Techniques for Games (08-24-2020 to present).

Current undergraduate research advisees

Zach Gaydos - BS Computer Science. Undergraduate research advisor. Project: Assymetric VR Games (08-26-2019 to present)

Madeleine Houser - BS Creative Technologies and Computer Science. Undergraduate research advisor. Project: Immersive Storytelling (01-19-2021 to present)

Aman Mathur - BS Computer Engineering. Undergraduate research advisor. Project: VR Haptics (05-24-2021 to present)

Current graduate research advisees (non-thesis)

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Demonstrated Efforts to Improve One's Teaching Effectiveness

05/28/2021 - Making the cut: Teaching with Video. 3 hours. TLOS: Professional Development Network.

04/28/2021 - Bring your own Brain: Celebrating Neurodiversity in STEM Careers. TLOS: Professional Development Network. 2 hours.

09/13/2019 - Principles of Effective Teaching Certificate Program. Virginia Tech Center for Excellence in Teaching and Learning. 9 months program.

06/13/2019 - Course Design Clinic. Virginia Tech Center for Excellence in Teaching and Learning. 16 hours.

11/01/2018 - Participation in the 2018 Alliance for the Arts in Research Universities Conference. 1-13, November 2018. Athens, Georgia.

Academic Service

Department, college, and university service, including administrative responsibilities

2020 to present - Member of the School Diversity and Inclusion Committee. School of Visual Arts.

2020 to present - Member of the College Honorifics Committee. College of Architecture and Urban Studies.

2018 to present - Member of the Graduate Program and Degree Committee. School of Visual Arts, Creative Technologies MFA program. Program redesign, admission and infrastructure meetings.

2019 to present - Member of College Curriculum Committee Member. College of Architecture and Urban Studies. Review of course and program proposals.

2019 to present - Member of Executive Committee. Virginia Tech's Creativity + Innovation Destination Area. Advising on diverse initiatives related to curriculum, outreach, infrastructure, and research.

2019 - Member of the School of Visual Arts Non-Tenure Track Promotion Committee.

2019 - Judge for Final projects of CS 4644: Creative Computing Studio. 1-05-2019. Professor Steve Harrison.

Service to students—involvement in co-curricular activities, advising student organizations, etc.

2018 to present - Main faculty supervisor of the Hokienauts team. Hokienauts is an interdisciplinary VT team competing on the NASA SUITS Challenge. The team is composed by 2 faculty and approximately 10 students from computer science, graphic design, engineering, and creative technologies each year.

2020 to present - Faculty advisor of the C+I Imagine Studio. Imagine studio is a virtual reality student team working on long term game projects. It consists of students from visual arts (3) and computer science (1).

2021 - Proposal reviewer for the CAUS Student-Initiated Research Grant Program (5). College of Architecture and Urban Studies.

2021 - Graduate school recommendation letters for one student. 11/22/2021.

2021 - Internship recommendation letter for one student. 01/11/2021.

2020 - ISMAR 2020 Mentor. One time mentoring with five conference student volunteers. 11/13/2020.

2020 - Fellowship recommendation letters for two students. 09/19/2020.

2020 - Internship recommendation letters for two students. 12/22/2020.

2020 - Fellowship recommendation letter for one student. 03/19/2020.

2019 - Graduate school recommendation letters for one student. 12/23/2019.

2019 - Internship recommendation letter for one student. 04/25/2019.

2019 - Graduate school recommendation letter for one student. 03/25/2019.

2018 - Organized a public exhibition of student's final projects from *TS: Augmented and Virtual Reality*. Virginia Tech Newman Library, 04 December 2018.

Professional Service

Review Panels and Committees

- 2021 - Panel Member, National Science Foundation, Computer & Information Science & Engineering Directorate
- 2021 - Program Committee Member and Reviewer for ACM Interactive 3D Graphics and Games Conference Papers (I3D)(3 papers)
- 2021 - Program Committee for the ACM Spatial User Interaction Conference (SUI) (4 papers)
- 2021 - Program Committee for the IEEE International Symposium on Mixed and Augmented Reality (ISMAR) (11 papers)
- 2021 - Program Committee for the Brazilian Symposium on Computer Games and Digital Entertainment (SBGAMES) (3 papers)
- 2021 - Reviewer for Transactions on Visualization and Computer Graphics (TVCG) (1 paper)
- 2021 - Reviewer for ACM Conference on Human Factors in Computing Systems (CHI) (1 paper)
- 2021 - Reviewer for the ACM Symposium on Virtual Reality Software and Technology (VRST) (1 paper)
- 2021 - Program Committee Member, IEEE VR 2022 Conference (AC for 8 papers)
- 2020 - Ad-Hoc funding proposal reviewer. National Science Foundation. (3 proposals).
- 2020 - Program Committee Forum on Grand Research Challenges in Games and Entertainment Computing in Brazil (1 paper)
- 2020 - Program Committee Member, IEEE Virtual Reality 2021 Conference (VR) (AC for 11 papers)
- 2020 - Reviewer for IEEE VR 2021 Conference Papers (6 papers)
- 2020 - Program Committee Member, SBGAMES, Grand Research Challenges
- 2020 - Program Committee Member, IEEE VR 2020 Conference (AC for 11 papers)
- 2020 - Reviewer for ACM DIS Conference Papers (1 paper)
- 2020 - Reviewer for IEEE VR 2020 Conference Papers (6 papers)
- 2020 - Reviewer for Transactions on Visualization and Computer Graphics (1 paper)
- 2019 - Reviewer for IEEE VR 2019 Conference Papers (3 papers)
- 2019 - Reviewer for Brazilian Symposium on Computer Games and Digital Entertainment (2 papers)
- 2019 - Reviewer for ACM IDC - Works-in-Progress (1 paper)
- 2018 - Reviewer for IEEE VR 2018 Conference Papers (1 paper)
- 2018 - Reviewer for Brazilian Symposium on Computer Games and Digital Entertainment (2 papers)
- 2018 - Reviewer for CHI 2018 Late Breaking Work (1 paper)
- 2017 - Reviewer for CHI Play Full Papers (1 paper)
- 2017 - Reviewer for SBGames 2017 Conference Papers (4 papers)
- 2017 - Reviewer for ACM 3DUI 2017 Papers and Technotees (2 papers)
- 2016 - Reviewer for SBGames 2016 (4 papers)
- 2015 - Reviewer for SBGames 2015 (4 papers)
- 2014 - Reviewer for SBGames 2014 (4 papers)
- 2013 - Reviewer for SBGames 2013 (4 papers)
- 2012 - Reviewer for SBGames 2012 (4 papers)
- 2011 - Reviewer for SBGames 2011 (6 papers)
- 2010 - Reviewer for SBGames 2010 (5 papers)
- 2009 - Reviewer for SBGames 2009 (1 paper)
- 2008 - Reviewer for SBGames 2008 (2 papers)
- 2008 - Reviewer for CLEI 2008 (onferencia Latinoamericana de Informática) (1 paper)

Professional meetings led or organized

- 2021 - The Power of Immersive Stories, 5th workshop on the future of human-computer interaction. Co-Organized with Mike Horning. Virginia Tech, Blacksburg, VA. April 15-16, 2021.
- 2021 - Pitch Your Lab Chair, 2021 IEEE International Symposium on Mixed and Augmented Reality (ISMAR). Bari, Italy. October 4-8, 2021.

- 2020 - Diversity and Inclusion Co-Chair, 2021 IEEE International Symposium on Mixed and Augmented Reality (ISMAR). Online. November 09-13, 2020.
- 2008 - Local chair for Computing Posters, SBGames 2008

Diversity

- 2020 - present: C+I Strategic Growth Area Experiential Learning Lead
- 2019 - 2020: C+I Strategic Growth Area Diversity & Inclusion Ambassador
- Wallace S. Lages, editor. *Tech Professor using Technology to Stimulate Diversity*, pages 28–29. ColorsVA Magazine, October 2018. Piece about my work promoting diversity in technology through gaming and virtual reality
- *Live TV Interview: ColorsVA is highlighting individuals for Hispanic Heritage Month*. Living Local, Fox WFXR, October 16th, 2018. TV channel focused on the county areas of Roanoke, Montgomery, Campbell, Appomattox, Amherst, Botetourt, Craig, Franklin and Bedford. URL <https://www.wfxrtv.com/lifestyle/living-local/colorsva-is-highlighting-individuals-for-hispanic-heritage-month/>

Presentations

- Wallace S. Lages⁺. Understanding the possible: Contributions from arts, science, and engineering. ICAT Playdate, Moss Arts Center, Virginia Tech, Blacksburg, VA. November 22, 2019
- Wallace S. Lages⁺, Daniel Monzel⁺⁺, Phat Nguyen⁺, Nanlin Sun⁺⁺, and Sara Moghaddam⁺⁺. Virtual sokoban. Virginia Tech Science Festival, Moss Arts Center, Virginia Tech, Blacksburg, VA. November 22, 2019
- Wallace S. Lages⁺, Samat Imamov⁺, and Emily Harris⁺. Roanoke star city arts festival
- Wallace S. Lages⁺, Samat Imamov⁺, and Emily Harris⁺. *50th anniversary of the Apollo 11 Day landing*. Science Museum of Western Virginia. Presentation of the Hokienauts AR Interface to museum visitors. 20 Jul. 2019

Other Pertinent Activities

Professional Development Activities

- 2021 Introduction to Machine Learning. Virginia Tech Statistical Applications and Innovations Group. 14 hours. (08-16-2021 to 08-19-2021)
- 2020 Early and Mid Career Mentoring Workshop. Computing Research Association (11-13-2020)
- 2020 Virginia Tech Professional Development Institute. (01-13-2020 to 01-14-2020)
- 2020 DoD Funding Seminar. (04-03-2020)
- 2020 Proposal Writing Workshop, Research grants. VT Department of History (01-24-2020)
- 2019 Short Course on Model Selection in R. Virginia Tech Statistical Applications and Innovations Group. 2.5 hours (9-13-2019)
- 2019 Your Research Protocol: Tips for successful submission. Virginia Tech Statistical Applications and Innovations Group 3 hours. (10-22-2019)
- 2018 New Faculty - Professional Development for New Faculty (08-15-2018)
- 2018 COI CITI Training Online - Research compliance training provided by the Office of the Vice President for Research and Innovation (11/1/2018)
- 2018 RCR CITI Training Online - Research compliance training provided by the Office of the Vice President for Research and Innovation (11/1/2018)
- 2014 Human Subjects Training (09-01-2014)
- 2014 Social & Behavioral Research (09-29-2014)

Media

- *The HokieNauts are in the finals for the NASA SUITS competition*. Living Local, Fox WFXR, June 25, 2019. TV channel focused on the county areas of Roanoke, Montgomery, Campbell, Appomattox, Amherst, Botetourt, Craig, Franklin and Bedford. URL <https://www.wfxrtv.com/lifestyle/living-local/the-hokienauts-are-in-the-finals-for-the-nasa-suits-competition/>
- J. Boone. *Hokies are finalists in NASA contest to design space helmets of the future*. Virginia Tech Daily, June 19, 2019. URL <https://vtnews.vt.edu/articles/2019/06/unirel-hokienauts.html>
- Colter Anstaett. *'Hokienauts' finalists in NASA competition*. WSLs 10 News, July 01, 2019. TV channel serving central and Southwest Virginia. URL <https://www.wsls.com/news/virginia/southside/hokienauts-finalists-in-nasa-competition>