

Leonardo Pavanatto

✉ lpavanat@vt.edu | 🏠 leonardopavanatto.com

Education

Ph.D. in Computer Science

Aug 2019 - Current

Virginia Tech, GPA: 4.0/4.0

- **Concentration:** Human-Computer Interaction (Advisor: Doug Bowman)

M.Sc. in Computer Science

Mar 2019

Pontifical Catholic University of Rio Grande do Sul (PUCRS), GPA: 9.32/10.0

- **Thesis:** 3D Modeling of Large Structures in Augmented Reality (Advisors: Marcio Pinho, Doug Bowman)

B.Eng. in Computer Engineering

Dec 2016

Pontifical Catholic University of Rio Grande do Sul (PUCRS), GPA: 8.82/10.0

- **Thesis:** Evaluating the Efficiency of an Ego-exocentric Technique for Cooperative Manipulation in Virtual Environments
- **Study abroad:** Illinois Institute of Technology (IIT), GPA: 3.87/4.0

Honors and Awards

2017 Academic Excellence fellowship recipient (2017-2018), from CAPES/PROEX

2016 Featured Student by the Brazilian Computer Society (SBC), with the highest GPA of class

2014 Brazil Scientific Mobility Program scholarship recipient (2014-2015), from CAPES

Research Experience

Virginia Tech - 3DI Group

Aug 2019 - Current

Student and Graduate Research Assistant

- Designed a prototype for displaying virtual monitors on a Microsoft HoloLens 2, with the objective of conducting office work.
- Designed novel approaches for virtual displays that take advantage of AR characteristics to enhance usability and productivity.
- Conducted user studies to understand how virtual displays compare to physical monitors (underway as of Aug-2020).
- Led a team submission to the IEEE VR 3DUI Contest 2020 about immersive storytelling and increasing empathy towards people with disability through embodiment.

PUCRS - GRV

Mar 2017 - Feb 2019

Graduate Research Assistant

- Designed an AR application for situated modeling in architecture, using Unity 3D (C#) and Microsoft HoloLens.
- Evaluated approaches to 3D modeling when the environment geometry is unknown; results were published at ACM SUI 2019.
- Evaluated methods of interaction for an AR game with behavioral animation of virtual characters using iOS devices.
- Designed an application to remotely present slides from inside a virtual environment, which was used at PUCRS Health Tech.

Duke University - DiVE

May 2015 - Jul 2015

Research Scholar

- Designed a technique for using asymmetric viewpoints in cooperative object manipulation in virtual reality, using Unity 3D (C#), Oculus Rift, and UDP/IP network communication.
- Led the development team, and presented our solution at the IEEE 3DUI Contest 2016.

Undergraduate Research Assistant

- Designed games for the Microsoft Kinect using XNA (C#) that were used by elderly people with mild cognitive impairment in a neurorehabilitation study.
- Designed and deployed an interface for 6 DOF tracking of a conductor's baton during a live orchestral performance.
- Developed an application for creating digital sculptures using handheld AR (Android/iOS).

Publications

Conference Papers:

1. **Pavanatto, L.**, Bowman, D., and Pinho, M. Evaluating the Impact of Point Marking Precision on Situated Modeling Performance. In Proceedings of ACM Symposium on Spatial User Interaction (SUI), 2019, 5 pages. [DOI: 10.1145/3357251.3357586](https://doi.org/10.1145/3357251.3357586)
2. Stahl, B., **Pavanatto, L.**, Sangalli, V., Klein, P., Copstein, R. and Pinho, M. DirectFlow: A Robust Method for Ocular Torsion Measurement. In IEEE 43rd Annual Computer Software and Applications Conference (COMPSAC), 2019, 6 pages. [DOI: 10.1109/COMPSAC.2019.00052](https://doi.org/10.1109/COMPSAC.2019.00052)
3. **Pavanatto, L.**, Kopper, R. and Pinho, M. EGO-EXO: A Cooperative Manipulation Technique with Automatic Viewpoint Control. In 20th Symposium on Virtual and Augmented Reality (SVR), 2018, 6 pages. [DOI: 10.1109/SVR.2018.00023](https://doi.org/10.1109/SVR.2018.00023)
4. **Pavanatto, L.**, Musse, S., Pinho, M. and Boussu, J. Evaluation of Selection Techniques on a Mobile Augmented Reality Game. In 17th Brazilian Symposium on Computer Games and Digital Entertainment (SBGames), 2018, 10 pages. [DOI: 10.1109/SBGAMES.2018.00024](https://doi.org/10.1109/SBGAMES.2018.00024)
5. Copstein, R., Abichequer, V., Andrade, M., Machado, L., Rodrigues, E., **Pavanatto, L.** and Pinho, M. Image Processing Strategies for Automatic Detection of Common Gastroenterological Diseases. In IEEE 42nd Annual Computer Software and Applications Conference (COMPSAC), 2018, 6 pages. [DOI: 10.1109/COMPSAC.2018.00090](https://doi.org/10.1109/COMPSAC.2018.00090)

Other Refereed Publications (posters, workshop papers, demo papers):

1. **Pavanatto, L.**, Lu, F., Davari, S., Harris, E., Folino, A., Imamov, S., Chekuri, S., Blustein, L., Lages, W. and Bowman, D. Get the job! An immersive simulation of sensory overload. In IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW), 2020, 2 pages. [DOI: 10.1109/VRW50115.2020.00106](https://doi.org/10.1109/VRW50115.2020.00106)
2. Sangalli, V., Oliveira, T., **Pavanatto, L.** and Pinho, M.S. SculptAR: An augmented reality interaction system. In IEEE Symposium on 3D User Interfaces (3DUI), 2017, 2 pages. [DOI: 10.1109/3DUI.2017.7893371](https://doi.org/10.1109/3DUI.2017.7893371)
3. **Pavanatto, L.**, Pinho, M. and Kopper, R. Design and preliminary evaluation of an EGO-exocentric technique for cooperative manipulation. In IEEE Symposium on 3D User Interfaces (3DUI), 2017, 2 pages. [DOI: 10.1109/3DUI.2017.7893342](https://doi.org/10.1109/3DUI.2017.7893342)
4. **Pavanatto, L.**, Oliveira, T., Sangalli, V., Pinho, M. and Kopper, R. Collaborative hybrid virtual environment. In IEEE Symposium on 3D User Interfaces (3DUI), 2016, 2 pages. [DOI: 10.1109/3DUI.2016.7460081](https://doi.org/10.1109/3DUI.2016.7460081)

Non-refereed Publications:

1. Bogoni, T, **Pavanatto, L.**, Sangalli, V., Pinho, M. Dental Simulator for Endodontic Access Cavity Preparation. Demo at IEEE Virtual Reality (VR), 2016, 2 pages. Available at [website](#).
2. Oliveira, G., **Pavanatto, L.**, Sangalli, V., Pinho, M. A Software Architecture for Distributed AR Applications. Demo at IEEE Virtual Reality (VR), 2016, 2 pages. Available at [website](#).
3. Lykawka, C., Oliveira, T., **Pavanatto, L.**, Sangalli, V., Siqueira, E., Campos, M, Pinho, M. Belt-Based Haptic Device for Representing Scene Depth Information. Demo at Virtual Reality (VR), 2016, 2 pages. Available at [website](#).

Skills

Expertise Areas *Research, Augmented Reality, Virtual Reality, 3D User Interfaces, Human-Computer Interaction*

Tools & Technologies *C#, Unity 3D, C, C++, OpenGL, OpenCV, Python, VB.net, Git*

Activities and Service

- Student Member, IEEE Computer Society.
- Student Member, ACM.
- Student Member, Virginia Tech's Center for HCI.
- Reviewed submissions for IEEE VR, ACM CHI, and SBGames.