

Andres Santos Torres, Ph.D.

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Area of Expertise

My current research focuses on interaction and collaboration paradigms in immersive environments. One of the main affordances of immersive technologies is the ability to generate in humans the illusion of being in a 3D interactive environment, where they can also interact with other people no matter where they are. However, the implementation of such new technologies raises some challenges that need to be considered when approaching the design and development of virtual scenarios for collaboration. My research has been focused on identifying usable and efficient approaches for users to take advantage of such technologies. The research activities and my professional background allow me to supervise and conduct Human-Computer Interaction qualitative and quantitative research. Furthermore, my background knowledge and experience allow me to conduct multidisciplinary research combining different areas, such as the Internet of Things, Computer Networks, and Network Security among other fields.

Employment History

Current

September 2022 – present 📌 **Teaching and Research Assistant with PhD.** Interactive Systems Group (DEI LAB), Department of Computer Science and Engineering, School of Engineering, Carlos III of Madrid University, Madrid, Spain.

Past Appointments

May 2023 – August 2023 📌 **Visiting Researcher.** Embodied Visualisation Lab (formerly known as Data Visualisation and Immersive Analytics Lab), Department of Human Centred Computer, Faculty of Information Technology, Monash University, Victoria, Australia.

2017 – 2022 📌 **Predoctoral Fellow.** Interactive Systems Group (DEI LAB), Department of Computer Science and Engineering, School of Engineering, Carlos III of Madrid University, Madrid, Spain.

2015 – 2016 📌 **Teaching Assistant.** Escuela Politécnica Nacional, Escuela de Formación de Tecnólogos, Quito, Ecuador.


2013 – 2015 📌 **Lab Technician.** Escuela Politécnica Nacional. Electric and Electronics Faculty. Department of Electronics, Telecommunications, and Computer Networks. Computer Networks (LAN/WAN/WLAN) Lab.

Education

2017 – 2022 📌 **Ph.D., Computer Science and Technology.** University Carlos III of Madrid. Thesis title: *The effects of interaction and visual representation of collaborative maps for immersive virtual environments.*



2016 – 2017 📌 **M.Sc., Computer Science and Technology.** University Carlos III of Madrid. Thesis title: *A comparative study of menus in virtual reality environments.*

Education (continued)






- 2009 – 2014  **Bsc. Eng. Electronics and Computer Networks.** Escuela Politécnica Nacional del Ecuador.
Thesis title: *Design and implementation of a prototype virtual shopping cart system using NFC communications and the Android system.*

Research Publications



Journal Articles

- 1 A. Santos-Torres, T. Zarraonandia, P. Díaz, and I. Aedo, “Comparing visual representations of collaborative map interfaces for immersive virtual environments,” *IEEE Access*, vol. 10, pp. 55 136–55 150, 2022.  DOI: 10.1109/ACCESS.2022.3176949.
- 2 A. Santos-Torres, T. Zarraonandia, P. Díaz, T. Onorati, and I. Aedo, “An empirical comparison of interaction styles for map interfaces in immersive virtual environments,” *Multimedia Tools and Applications*, vol. 79, pp. 35 717–35 738, 2020.  DOI: 10.1007/s11042-020-08709-9.

Conference Proceedings



- 1 A. Alshardy, S. Goodwin, A. Santos-Torres, and A. Liebman, “Virtual reality for enhancing engagement with net zero transitions,” in *2023 Workshop on Energy Data Visualization (EnergyVis)*, 2023, pp. 21–26.  DOI: 10.1109/EnergyVis60781.2023.00011.
- 2 T. Zarraonandia, P. Díaz, A. Santos, Á. Montero, and I. Aedo, “A toolkit for creating cross-reality serious games,” in *Games and Learning Alliance: 7th International Conference, GALA 2018, Palermo, Italy, December 5–7, 2018, Proceedings 7*, Springer, 2019, pp. 297–307.  DOI: 10.1007/978-3-030-11548-7_28.
- 3 A. Santos, T. Zarraonandia, P. Díaz, and I. Aedo, “A virtual reality map interface for geographical information systems,” in *Proceedings of the 2018 international conference on advanced visual interfaces*, 2018, pp. 1–3.  DOI: 10.1145/3206505.3206580.
- 4 A. Santos-Torres, T. Zarraonandia, P. Díaz, and I. Aedo, “Exploring interaction mechanisms for map interfaces in virtual reality environments,” in *Proceedings of the xix international conference on human computer interaction*, 2018, pp. 1–7.  DOI: 10.1145/3233824.3233828.
- 5 A. Santos, T. Zarraonandia, P. Díaz, and I. Aedo, “A comparative study of menus in virtual reality environments,” in *Proceedings of the 2017 ACM International Conference on Interactive Surfaces and Spaces*, 2017, pp. 294–299.  DOI: 10.1145/3132272.3132277.

Participation in competitive research projects




- Jan 2019 – Sep 2022  **Identifying the affordances of cross-reality to enhance collaboration (CROSSCOLLAB):**
- Role: Researcher
- Funding entity: Spanish Research State Agency (AEI).
- Sep 2017 – Dec 2020  **Pervasive and Affordable Technologies for Civic Engagement (PACE):**
- Role: Researcher.
- Funding entity: Spanish Ministry of Economics Affairs and Digital Transformation.

Awards and Scholarships

Awards


- 2022  **Ph.D. Outstanding Thesis Award**, Awarded by University Carlos III of Madrid.
- 2018  **Special mention**, Accessit Jesús Lores for an outstanding research paper “Exploring interaction mechanisms for map interfaces in virtual reality environments”.

Scholarships


- 2023  **Mobility Grant for Young Researchers**, Given by University Carlos III of Madrid to undertake the research visit to the Embodied Visualisation Lab at Monash University.
- 2017  **Scholarship**, Given by University Carlos III of Madrid to pursue the Ph.D.
- 2016  **Scholarship**, Given by Fundación Carolina to outstanding Ibero-American students to pursue M.Sc.

Teaching and Supervision Experience


Master Courses Teaching Experience

- 2017 - 2018  **University Carlos III of Madrid, School of Engineering, Madrid - Spain**
- *Interactive Product Design and Evaluation (Lab.) Spanish: Spring 2018.*


Bachelor Courses Teaching Experience

- 2018 - present  **University Carlos III of Madrid, School of Engineering, Madrid - Spain**
- *Web Developing Techniques (Theory & Lab.) Spanish: Fall 2023.*
- *User Interfaces (Theory & Lab.) Spanish: Fall 2022, Fall 2023.*
- *Programming (Lab.) English: Fall 2018, Fall 2019. Spanish: Fall 2019, Fall 2020, Fall 2021, Fall 2022.*
- *Interactive Systems Design (Lab.) Spanish: Spring 2018, Spring 2019.*
- *Advanced knowledge of spreadsheets(Theory & Lab.) English: Spring 2021.*

Technical Courses Teaching Experience




- 2014 - 2016  **Escuela Politécnica Nacional, Escuela de Formación de Tecnólogos, Quito - Ecuador**
- *Network Security (Theory & Lab.) Fall 2015, Spring 2016 (Spanish)*
- *Wireless Local Area Network (Theory & Lab.) Fall 2015, Spring 2016 (Spanish)*
- *Introduction to Calculus (Theory) Fall 2015, Spring 2016 (Spanish)*

Ph.D. Students Supervision

- 2023 - 2026  **Amal Al Shardy** (External co-supervisor) Monash University. *Research topic: Leveraging Immersive Technology to Enhance and Foster Stronger Association with Net Zero Transition Initiatives and Projects in the Australian Context (Ongoing).*




Teaching and Supervision Experience (continued)

Bachelor Students Supervision

- 2022 - 2023  **Carlos Fernandez Carchenilla** (Main supervisor) Universidad Carlos III de Madrid. *Bachelor Thesis*: Design and development of an immersive VR visualization of the heart rate in real-time using IoT sensors (finished).
-  **Diego Muñoz del Val** (Main Supervisor) Universidad Carlos III de Madrid. *Bachelor Thesis*: Design and development of an immersive collaborative bulleting board using augmented reality (finished).
- 2021 - 2022  **Daniel Anton Blazquez** (Main Supervisor) Universidad Carlos III de Madrid. Design and Development of a distributed system to manage environmental conditions of medical batches using LoRaWAN technologies and web services (finished).

Service




University service

- February 2021 – present  **Elected Member of the School of Engineering Board**: The School Board is the collegiate body of administration of the Faculties or School. I was elected as a representative for assistant doctors, assistants and research fellows, which will constitute 10 percent of the Board.
- January 2020 – September 2022  **Elected Member of The Department of Computer Science Council (now ex officio member)**: The Department Council is the collegiate administrative body of the Department. I was elected as a representation assistants, research fellows, and predoctoral fellows who will constitute 15 percent of the Council.
- October 2021 – present  **Avanza Program Teacher Tutor**: The Avanza Program aims to provide additional support to students whose academic results after the first semester have not been satisfactory. With this program, the students can improve this situation in the extraordinary call. It is also aimed at students who are in a higher year and run the risk of forced abandonment of the bachelor's program due to non-compliance with the permanence criteria.

Conference organize committee service



- 2024  **ACM WomENCourage**: Local Organizing Committee.

Journal paper reviewer

- 2023  **Springer**: Universal Access in the Information Society.
-  **Springer**: Virtual Reality Journal.
- 2020  **Plos**: One.



Service (continued)

Conference paper reviewer



- 2023  **INTERACT**: International Conference of the IFIP Technical Committee 13 on Human-Computer Interaction (INTERACT).
- 2022  **IEEE VR**: Virtual Reality Conference.

Talks and Presentations


Presentations at international conferences

- 2018  **Paper presentation at XIX International Conference on Human Computer Interaction Interacción Palma de Mallorca, Spain**
Paper title: Exploring interaction mechanisms for map interfaces in virtual reality environments.
- 2017  **Poster presentation at ISS ACM International Conference on Interactive Surfaces and Spaces, Brighton UK.**
Poster title: A comparative study of menus in virtual reality environments.






Invited speaker

- 2023  **Monash University, Embodied Visualisation Lab., Melbourne, Australia**
- *Talk*: "The Effect of interaction and visual representation of collaborative maps for immersive virtual environments".
- 2020  **Universidad Politécnica Nacional, Andean Wireless Communications & Applications Workshop, Quito, Ecuador**
- *Workshop*: "Introduction to WebVR Development".

Dissemination events





- 2019 - present  **Madrid Week of Science and Innovation - Madrid, Spain**
- *Workshop*: "Everyone can create their own Virtual Reality and it's at your mobile phone fingertips" (2019)
- *Workshop*: "Create your own Virtual Reality: an introduction to the design and construction of virtual scenarios" (2020).
- *Workshop*: "Listen and move with the sounds of your body: sound technology to promote physical activity" (2020) (Facilitator).
- *Workshop*: "Let's talk about human values in mixed reality futures!" (2023) (Facilitator).

Skills





- Languages  Strong reading, writing and speaking competencies for English, and Spanish.
- Coding  Java, PHP, Python, R, C, C++, C#, \LaTeX , ...
- Databases  MySQL, PostgreSQL, HSQL, SQLite.
- Web Dev  HTML, CSS, JavaScript.
- Misc.  Academic research, teaching, training, Unity Development Engine, \LaTeX typesetting and publishing.

Training



Research Training

- 2022  **Personal data management for research activities.** University Carlos III of Madrid. 4 hours.
- 2018  **Advanced use of SCOPUS.** Fundación Española para La Ciencia y Tecnología (FECYT). 3 hours.
-  **Tools and Strategies for the deployment and monitoring of the researcher's digital reputation.** University Carlos III of Madrid. 5 hours.
-  **How to write and publish your papers in high-impact journals.** The Charles-worth group. 2 hours.


Teaching Training

- 2022  **Academic teaching excellence: English as a Medium of Instruction (EMI).** University Carlos III of Madrid. 10 hours.
- 2019  **Teaching and learning.** University Carlos III of Madrid. 10 hours.
- 2018  **Introduction to teaching.** University Carlos III of Madrid. 3 hours.
-  **How to design and plan a MOOC/SPOC course.** University Carlos III of Madrid. 3 hours.

Soft Skills Training

- 2019  **Talk in front of a camera.** University Carlos III of Madrid. 6 hours.
- 2018  **Multimedia production: scripting and pre-production of videos.** University Carlos III of Madrid. 4 hours.

Certifications

- 2021  **Proeficiency in English.** LanguageCert Level 3 Certificate in ESOL international (Speaking Listening, Reading, Writing)(Mastery C2).

References

References available upon request