

✉ luis-eduardo@dsv.su.se

🌐 luisqtr.com

🔄 [luisqtr](#)

in [luisqtr](#)

🐦 [luisqtr0](#)

Updated: November, 2023

Luis Quintero

PhD Scholar, Stockholm University

Curriculum vitæ

Research Interests

User modeling in immersive interactive environments
Virtual reality (VR) and extended reality (XR)
Machine learning for time-series data
Systems development with body sensing technologies

Employment

- 2019–present **Researcher**, *Stockholm University*, Stockholm, Sweden
Department of Computer and Systems Sciences, (DSV). Member of the Data Science Group [🔗](#).
Design, run, and evaluate research projects in the fields of data science and explainable artificial intelligence with focus in digital personalization from human sensing and immersive technologies.
- 2018–present **Founder/Technical Lead**, *PortalSense*, Manizales, Colombia
Leads the strategic vision and technical product development operations in a startup helping real estate companies commercialize their new projects with interactive VR applications. Website [🔗](#).
- Summer 2019 **Research Assistant**, *Stockholm University*, Stockholm, Sweden
Department of Computer and Systems Sciences, (DSV). Member of the Data Science Group [🔗](#).
Developing a web platform to showcase application of explainability algorithms on healthcare data.
- 2017–2019 **Consultant/Developer**, *Independent Contractor*, Remote
Designed and developed VR applications for professional training (*USA*), architectural visualization (*Colombia*), and healthcare (*Sweden*). Details of these projects available on my website [🔗](#).
- Spring 2017 **Research Assistant**, *NeuroRehabLab-Interactive Technologies Institute*, Madeira, Portugal
Developed several frameworks in Unity to aid mental and physical well-being through interactive applications exploiting heart rate and respiration sensors to profile the users physical conditions.
- 2015-2017 **Bioengineering Professional**, *BIOS (Center for Bioinformatics)*, Manizales, Colombia
Implemented custom hardware-software interfaces for large-scale displays using body-worn devices. Supported an applied research project on automated quality control with computer vision algorithms.

Education

- 2019–2023 **PhD. Computer and Systems Sciences**, *Stockholm University*, Stockholm, Sweden
Department of Computer and Systems Sciences (DSV).
DISSERTATION: User Modeling for Adaptive Virtual Reality Environments [🔗](#).
Personalization from behavioral and physiological time series.
- 2017–2019 **MSc. Health Informatics**, *Karolinska Institutet*, Stockholm, Sweden
Department of Learning, Informatics, Management and Ethics (LIME).
DISSERTATION: Facilitating Technology-based Mental Health Interventions with Mobile Virtual Reality and Wearable Smartwatches. [🔗](#) *Heart Rate Variability Analysis in Slow-Breathing Exercises.*

- 2010–2015 **BSc. Electronics Engineering**, *National University (UNAL)*, Manizales, Colombia
GPA: 4.4/5.0 — Ranked 3rd among graduated students, and top-best in national engineering exam.
Emphasis on signal processing, hardware programming, control theory, and telecommunications.
- 2009–2010 **Associate Degree on Computer Systems**, *Unitécnica*, Manizales, Colombia
Principles of computer systems, web development, databases and software/hardware configuration.

Teaching

- 2020–2023 **Teaching Assistant**, *Stockholm University*, Stockholm, Sweden
Lab tutor in the following courses for students at Master's level:
- *Data Mining with Python* for the course DAMI. 140h/year.
- *Introduction to Data Mining* for the course DSHI. 75h/year.
- *Building Virtual Reality Applications with Unity* for the course DET. 20h/year.
- Spring 2016 **Lecturer**, *Caldas University*, Manizales, Colombia
Course leader for 19 undergraduate students in: *Microprocessors architecture*. 64h.
- Spring 2016 **Lecturer**, *Unitécnica*, Manizales, Colombia
Course leader in: *App development with Unity*, 70h. *Introduction to Databases*. 40h.
- 2012-2014 **Undergraduate Teaching Assistant**, *National University*, Manizales, Colombia
Lab tutor for undergraduate students in the courses:
- *Dynamic Systems and Control*. (Autumn 2012, Spring 2013). 64h/term.
- *Communication Systems* (Autumn 2014). 64h.

Qualifications & Skills

- Languages English (C1 —IELTS= 7.0), Spanish (Native), Swedish (Limited), Portuguese (Limited).
- Programming C#, C++, Python, MatLab, \LaTeX .
- Frameworks Unity, OpenXR, Scikit-Learn, OpenCV, Qt.
- Hardware Meta Quest, Vive VR headsets, Polar ECG, Myo EMG, Emotiv EEG, embedded systems.
- Research Academic writing, teaching, data science, systems development, electronics, HCI.

Publications

Research Projects

- Complete description of my research projects is on my personal website [🔗](#).
Complete list of publications available on my Google Scholar [🔗](#).

📄 Dissertations

- [1] **Quintero, L.** 2023c. "User Modeling for Adaptive Virtual Reality Experiences: Personalization from Behavioral and Physiological Time Series". PhD thesis. Stockholm, Sweden: Stockholm University, Department of Computer and Systems Sciences. 84 pp.
- [2] **Quintero, L.** 2019a. "Facilitating Technology-based Mental Health Interventions with Mobile Virtual Reality and Wearable Smartwatches". Master's Thesis. Stockholm University. 61 pp.

📄 Journal Articles

- [1] **Quintero, L.**, Fors, U., and Papapetrou, P. 2023b. "Personalized feature importance ranking for affect recognition from behavioral and physiological data". In: *IEEE Transactions on Games*, pp. 1–10.
- [2] Muñoz, J. E. **Quintero, L.** et al. Apr. 16, 2020. "A Psychophysiological Model of Firearms Training in Police Officers: A Virtual Reality Experiment for Biocybernetic Adaptation". In: *Frontiers in Psychology* 11 (April), pp. 1–14.
- [3] i Badia, S. B. **Quintero, L.** et al. 2019d. "Toward Emotionally Adaptive Virtual Reality for Mental Health Applications". In: *IEEE Journal of Biomedical and Health Informatics* 23.5, pp. 1877–1887.

Conference Proceedings

- [1] Bernsland, M., [. . .], **Quintero, L.**, et al. 2022a. "CS:NO – an Extended Reality Experience for Cyber Security Education". In: *ACM International Conference on Interactive Media Experiences*. Series Title: IMX '22. Aveiro, Portugal, pp. 287–292.
- [2] **Quintero, L.** et al. 2022b. "Excite-O-Meter : an Open-Source Unity Plugin to Analyze Heart Activity and Movement Trajectories in Custom VR Environments". In: *IEEE Conference on Virtual Reality and 3D User Interfaces - Abstracts and Workshops (VRW)*, pp. 46–47.
- [3] **Quintero, L.** et al. 2021a. "Effective Classification of Head Motion Trajectories in Virtual Reality using Time-Series Methods". In: *IEEE International Conference on Artificial Intelligence and Virtual Reality (AIVR)*. Tsinghua, Taiwan, pp. 38–46.
- [4] **Quintero, L.** et al. 2021b. "Excite-O-Meter: Software Framework to Integrate Heart Activity in Virtual Reality". In: *IEEE International Symposium on Mixed and Augmented Reality (ISMAR)*. Bari, Italy, pp. 357–366.
- [5] Muñoz, J. E. **Quintero, L.** et al. 2021c. "Taxonomy of Physiologically Adaptive Systems and Design Framework". In: *Adaptive Instructional Systems. Design and Evaluation. HCII 2021. Lecture Notes in Computer Science*. Vol. 12792 LNCS. ISSN: 16113349, pp. 559–576.
- [6] **Quintero, L.** 2020b. "Understanding Research Methodologies when Combining Virtual Reality Technology with Machine Learning Techniques". In: *13th ACM International Conference on Pervasive Technologies Related to Assistive Environments (PETRA)*. Corfu: ACM Press, pp. 209–212.
- [7] **Quintero, L.** et al. 2019b. "Implementation of mobile-based real-time heart rate variability detection for personalized healthcare". In: *IEEE International Conference on Data Mining Workshops, ICDMW*. Vol. 2019-Novem. ISSN: 23759259. IEEE, pp. 838–846.
- [8] **Quintero, L.**, Papapetrou, P., and Munoz, J. E. 2019c. "Open-Source Physiological Computing Framework using Heart Rate Variability in Mobile Virtual Reality Applications". In: *IEEE International Conference on Artificial Intelligence and Virtual Reality (AIVR)*. IEEE, pp. 126–133.
- [9] Muñoz, J. E., Pope, A. T., and **Quintero, L.** 2016. "Integrating Biocybernetic Adaptation in Virtual Reality Training Concentration and Calmness in Target Shooting". In: *Physiological Computing Systems*. Springer International Publishing, pp. 218–237.

Books/Reports

- [1] European Commission et al. 2023a. *Extended reality : opportunities, success stories and challenges (health, education)*. Publications Office of the European Union. 202 pp.

Supervision & Advising

Main supervisor in Master's Theses

- 2023 *Helén Han*: Treatment Adherence in Digital Psychotherapy - Using Machine Learning to Predict Patient No-shows. MSc. Health Informatics, Karolinska Institutet.
- Fan Zhang*: Exploring the requirements for the design of virtual reality serious games to support people with dementia. MSc. Health Informatics, Karolinska Institutet.
- Mi Zhang*: Exploring how virtual material appearance with control-display ratio drives the weight perception in VR within two-handed hand tracking input. MSc. Design for Immersive Technologies, DSV, Stockholm U.
- Johan Ekman*: Comparing engagement of VR and non-VR games for programming learning purposes. MSc. Design for Immersive Technologies, DSV, Stockholm U.

Co-supervisor in Master's Theses

- 2022 *Daniel Schulze*: Explainability of personalized stress detection models from wearable-collectible physiological data. MSc. Health Informatics, Karolinska Institutet. Main Superv.: Jaakko Hollmén

Divya Damodaran: Machine Learning for prediction of start and termination of Freezing of Gait in Parkinson's Disease. MSc. Health Informatics, Karolinska Institutet. MS: Jaakko Hollmén

Yujie Xiang: Understanding Heart Rate Responses to Detect Emotional Valence Using Interpretable Machine Learning. MSc. Health Informatics, Karolinska Institutet. MS: Jaakko Hollmén

2021 *Dana Kokey*. Towards detecting arousal level from heart rate information in virtual reality 360-degree videos. MSc. Health Informatics, Karolinska Institutet. MS: Panagiotis Papapetrou

Alborz Alipour. Outlier Detection in Stock Market Prediction through Anomaly Detection. MSc. Computer and Systems Sciences, Stockholm University. MS: Sindri Magnússon

Samiha Nalwooga. Knowledge distillation for building accurate plant classification models for mobile devices. MSc. Computer and Systems Sciences, Stockholm U. MS: Sindri Magnússon

Mawada Hamad. The trade-off between performance and compression rate when applying knowledge distillation. MSc. Computer and Systems Sciences, Stockholm U. MS: Sindri Magnússon

Ali Mussayab. Design requirements for Recruiting Contingent Café Baristas with Immersive Virtual Reality Simulations. MSc. Design for Immersive Technologies, Stockholm U. MS: Robert Ramberg

Honors

Research Grants

2023–2026 **Wallenberg Foundation** , 4.5MSEK, Project Member

Let us talk about non-verbal communication: Investigation of interpersonal psychotherapeutic interactions and their effect on treatment outcomes using AI and time series analysis.


Industrial Funding


2022–2023 **Fondo Emprender** , 20kEUR, Project Leader


Seed funding to startup the company PortalSense in Manizales (Colombia), which develops architectural virtual reality visualization for real estate and public infrastructure projects.

Scholarships

Summer 2022 Donation scholarship for research activities during PhD, awarded by Stockholm University.

2017–2019 Scholarship for Master's studies in Sweden, awarded by the Swedish Institute 

2013–2015 Grant for tuition fees during undergraduate program, by Roberto Rocca Foundation 

Winter 2014 Grant for top undergraduate students to visit China, by Seeds for the future Huawei 

2009–2010 Scholarship for vocational training in computer systems, granted by a private company.

Academic Awards

2015 Ranked 3rd in GPA among undergraduate students - National University of Colombia

2012 Best robot design and programming - VEX Robotics Competition

2009 Ranked 1st among high-school students

Professional Service

Reviewer

Journal Data Mining and Knowledge Discovery, *Springer*: 2022, 2023

International Journal of Human-Computer Interaction, *Tandford*: 2022

Granular Computing, *Springer*: 2019

Conferences IEEE VR: 2021

IEEE AIVR: 2020, 2021, 2022

IEEE ACII: 2023

PC Member IEEE AIXVR 2020-present: Artificial Intelligence & Extended and Virtual Reality
Demo Chair ACM IMX 2024: International Conference on Interactive Media Experiences
Proc. Chair ACM MUM 2024: International Conference on Mobile and Ubiquitous Multimedia

Invited Talks and Panels

Sep 2023 **Invited lecturer**, *Umeå Institute of Design*, Umeå, Sweden
Prototyping Virtual Reality Applications in Unity

June 2023 **Invited lecturer**, *RUAV*, Cali, Colombia
Introduction to Data Analytics and Artificial Intelligence

Feb 2023 **Research visit**, *DIS group at CWI*, Amsterdam, Netherlands
User Modeling for Adaptive Virtual Reality Environments

Sep 2021 **Invited panelist**, *Conference EUROSIS GAME-ON*, Portugal, (virtual)
The Use of Digital Games and AI for Health and Wellbeing

Oct 2020 **Invited Interview**, *Podcast Immersive Learning Network*, USA, (virtual)
Discussing methodological aspects of combining machine learning in virtual reality research.


Associations & Memberships


2022-2023 Chair of the PhD Council at DSV, Stockholm University.


2021-ongoing Member of XRCOL: Colombian Association for Immersive, Interactive, and Emerging Tech.

2019-ongoing Member of SANC: Sweden Alumni Network Colombia - SI Leadership Network.

Press & Blog Articles

Feb 2023 EU Commission: **XR - Opportunities and Challenges in Health and Education** 

May 2022 SU Blog: **Time-series analysis for behavioural user modelling in VR** 

May 2019 CFC Blog: **Visit a new construction project in virtual reality** 

Certifications & Achievements

IRL Courses

2023 **Medical Time Series Mining**, *VAIA - KU Leuven*, Belgium, 16h.

2022 **Entrepreneurial Storytelling**, *SSES*, Sweden, 16h.

2022 **Summer school: AI and Games**, *Modl.ai*, Greece, 40h.

2019 **Introduction to Teaching**, *Stockholm University*, Sweden, 80h.

2018 **Building Innovation Strategies**, *School of Entrepreneurship*, Sweden, 16h.

2016 **Scientific Computing**, *ICT Ministry*, Colombia, 120h.

2016 **Exploring Physiological Data for Interactive Apps**, *BIOS*, Colombia, 16h.

2016 **Fundraising: Tools and Methodologies for Financing Projects**, *BIOS*, Colombia, 16h.

2011 **Computer Maintenance**, *Unitécnica*, Colombia, 120h.

2009 **Electrical Installations**, *SENA*, Colombia, 900h.

2007 **Certificate in English Language**, *Colombo-American Center*, Colombia, 640h.

MOOCs

2016 **A System View of Communications**, by *Hong Kong UST* in *EdX*, (3 terms).

2015 **Project Management for Professionals**, by *IADB* in *EdX*.

2015 **Computation Structures: Digital Circuits**, by *MIT* in *EdX*.

2014 **Introduction to Computer Programming**, by *IIT Bombay* in *EdX*.

- 2014 **Fundamentals of Electrical Engineering**, by *Rice University in Coursera*.
- 2013 **Beginning Game Programming with C#**, by *University of Colorado in Coursera*.