Esteban Segarra Martinez

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https://scholar.google.com/citations?hl=en&user=2Vmd79sAAAAJ&view_op=list_works&sortby=pubdate

Education

University of Central Florida August 2019 – December 2025
PhD Computer Science (3.67 /4.0) Orlando, FL, USA
PhD Chairs: Dr. Annie Wu and Dr. Ryan McMahan
Dissertation name: Effects of Environmental and Camera Properties on Simultaneous Localization and Mapping

University of Central Florida August 2019 - June 2022
MS Computer Science (3.67 /4.0) Orlando, FL, USA
Masters Advisor: Dr. Ryan McMahan

Florida Polytechnic University August 2015 - May 2019
BS Computer Engineering (3.81 / 4.0) Magna Cum Laude Lakeland, FL, USA

- Concentration in Machine Intelligence

Research Interests

Virtual Reality Motion Capture, Applications, and Learning
Point clouds for Spatial Sensing and Synthetic Environmental Sensing with Simultaneous Localization and Mapping (SLAM)
Systematic evaluation and statistical evaluation of robotic systems using SLAM
Application of alternative synthetically sourced images for SLAM evaluation

Publications

Conferences

1. Lori C. Walters, Robert A. Michlowitz, **Esteban Segarra Martinez**, Ryan P. McMahan and Joesph T. Kider, "MemoryScan Environments: Creating Large-Scale Memory-Evocative Digital Twins," 2023 IEEE 3rd International Conference on Digital Twins and Parallel Intelligence (DTPI), Orlando, FL, USA, 2023. https://doi.org/10.1109/DTPI59677.2023.10365482
2. **Esteban Segarra Martinez**, Stephen V Maldonado, Annie Wu, Ryan P. McMahan, Xinliang Liu, and Blake Oakley. July 2022. Effects of Imputation Strategy on Genetic Algorithms and Neural Networks on a Binary Classification Problem. ACM GECCO 2022. https://doi.org/10.1145/3512290.3528863
3. **Esteban Segarra Martinez**, Annie Wu, Ryan P. McMahan. March 2022. Research Trends in Virtual Reality Locomotion Techniques. IEEE VR 2022. https://doi.org/10.1109/VR51125.2022.00046

Workshop Papers

4. **Esteban Segarra Martinez**, Ayesha A. Malik, and Ryan P. McMahan. "CLOVR: Collecting and Logging OpenVR Data from SteamVR Applications." In 2024 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW), 485–92, 2024. https://doi.org/10.1109/VRW62533.2024.00095.

Posters

1. Shelly Bagchi, **Esteban Segarra Martinez**, Jeremy Marvel, Karl Van Wyk, and Megan Zimmerman. (March 2019). Metrological Testing of Wearable Technology and Virtual Reality for Precision Robot Control. Poster presented at: HRI IEEE/ACM conference in Daegu, Korea.

Collaboration Papers

1. Mykola Maslych, Mohammadreza Katebi, Christopher Lee, Yahya Hmaiti, Amirpouya Ghasemaghaei, Christian Pumarada, Janneese Palmer, **Esteban Segarra Martinez**, Marco Emporio, Warren Snipes, Ryan P McMahan, Joseph J LaViola Jr. "Mitigating response delays in free-form conversations with LLM-powered intelligent virtual agents." In CUI 2025: Proceedings of the 7th ACM Conference on Conversational User Interfaces. 2025. https://doi.org/10.1145/3719160.3736636
2. Mykola Maslych, Difeng Yu, Amirpouya Ghasemaghaei, Yahya Hmaiti, **Esteban Segarra Martinez**, Dominic Simon, Eugene M. Taranta, Joanna Bergström, and Joseph J. LaViola. "From Research to Practice: Survey and Taxonomy of Object Selection in Consumer VR Applications." In 2024 IEEE International Symposium on Mixed and Augmented Reality (ISMAR), pp. 990-999. IEEE, 2024. https://doi.org/10.1109/ISMAR62088.2024.00115
3. Amirpouya Ghasemaghaei, Yahya Hmaiti, Mykola Maslych, **Esteban Segarra Martinez**, and Joseph J. LaViola. "Throwing in Virtual Reality: Performance and Preferences Across Input Device Configurations." In 2024 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW), 897–98, 2024. https://doi.org/10.1109/VRW62533.2024.00245.

4. Amirpouya Ghasemaghaei, Mykola Maslych, Yahya Hmaiti, **Esteban Segarra Martinez**, and Joseph J LaViola Jr. "Towards Better Throwing: A Comparison of Performance and Preferences Across Point of Release Mechanics in Virtual Reality," 2024. https://doi.org/10.1145/3670947.3670963

Planned Future Papers

1. RAL: IEEE Robotics and Automation Letters
2. ICRA 2026

Archived Publications

1. **Esteban Segarra Martinez** and Ryan P. McMahan. RecolorCloud: A Point Cloud Tool for Recoloring, Segmentation, and Conversion. 2023. **Planned for publication**. Referenced by collaborators. https://doi.org/10.48550/arXiv.2310.12470
2. **Esteban Segarra Martinez** and Bradford Towle Jr. March 2018. Application of an Augmented Reality Device as a Rangefinder and Odometry Source. Inter. Society of Computers and Their Applications.
3. **Esteban Segarra Martinez** and Bradford Towle Jr. October 2018. Simulating an Unknown Environment with an Integrated Physical and Virtual Space. 27th Proceedings of the Inter. Conference on Software Engineering and Data Engineering.
4. **Esteban Segarra Martinez** and Bradford Towle Jr. October 2017. Investigating the Feasibility of using a Microsoft HoloLens as a Robotic Sensor and Odometry Source. 26th Proc. of the Inter. Conf. on Software Engineering and Data Engineering.

Workshops

Ryan P. McMahan, Marc Erich Latoschik, **Esteban Segarra Martinez**, and Vivek C. Nair. Workshop on Capturing and Logging Ecological Virtual Experiences and Reality (CLEVER). IEEE VR 2024

Ryan McMahan, Nicholas Gans, **Esteban Segarra Martinez**. InfraStructure for Photorealistic Image and Environmental Synthesis (I-SPIES) Reveal. ISMAR 2022. (**Contributed**)

Papers Reviewed

One paper for ISMAR 2025
One paper for IEEE VR 2025
One paper for CHI 2025
Four papers for Workshop on Capturing and Logging Ecological Virtual Experiences and Reality (CLEVER) at IEEE VR 2024
One paper for Computer-Human Interaction in Play (CHI PLAY) 2023
Three papers for ISMAR 2022
Two papers for IEEE VR 2022 Workshop: 3D Content Creation for SimulationTraining (TrainingXR)

Experience

Academic

Graduate Teaching Assistant for the Computer Science Department at UCF Aug. 2024 – May. 2025
COP3223C: Intro to Programming Orlando, FL, USA

- Graded homework and exams. (Approximately 70 – 80 students for a class of 240 students)
- Office hours and answered emailed questions.
- In-class laboratory hours with programming examples.
- Consult and advise the professor on better strategies to apply in the class.

Graduate Research Student Fall 2021 – Aug. 2024
Extended Reality and Training Laboratory (Dr. Ryan McMahan) Orlando, FL, USA

- Primary developer for RecolorCloud and Collecting and Logging OpenVR (CLOVR)
- Write and publish in related conferences such as IEEE VR and GECCO
- Dissertation name: Capturing and Evaluating Point Clouds for Computer Vision Applications
- Primary fields of study: Computer graphics, Computer Vision, and Artificial Intelligence

Graduate Teaching Assistant for the Computer Science Department at UCF Aug. 2021 – Dec. 2021
COP3223C: Intro to Programming Orlando, FL, USA

- Graded homework and exams.
- Office hours and answered emailed questions.
- In-class laboratory hours with programming examples.
- Consult and advise the professor on better strategies to apply in the class.

Graduate Teaching Assistant for the Computer Science Department at UCF May 2021 – Aug. 2021
CNT4714 Enterprise Computing Orlando, FL, USA

- Graded homework.
- Office hours and answered emailed questions.

- In-class laboratory hours with programming examples.

Graduate Research Assistant Jan. 2020 – May 2020

Artificial Intelligence Laboratory at UCF (Dr. Annie Wu.) Orlando, FL, USA

- Research experience for writing a simulation model to be used for evaluating multi-agent simulations.
- Internal NSF codebase – Not available for external viewing
- Writing reports, extending C codebase.

Graduate Teaching Assistant for the Computer Science Department at UCF May 2021 – Aug. 2021

2545C-01 Introduction to Databases Orlando, FL, USA

- Graded homework.
- Support for undergraduate students in database concepts through one-to-one help.
- Assisted with a refresher to MySQL and database table design and implementation.

Undergraduate Teaching Assistant at Florida Polytechnic University 2017 – 2019

Physics 1 and 2, CNT 3004 - Computer Networks & Communication Orlando, FL, USA

- Graded homework.
- Proctoring for exams.
- Support for undergraduate students through one-to-one help.

Professional

National Institute of Standard and Technology May 2020 – May 2021

Computer Scientist at Materials Measuring Laboratory Gaithersburg, MD, USA

- Front-end developer and support. API integration between front-end and back-end.
- Daily meetings with administration for project support and end-requirements.
- Report and provide consultatory advice on office matters.

Internship

National Institute of Standard and Technology (Shelly Bagchi) May 2019 – August 2019

Summer Undergraduate Research Fellow; Intelligent Systems Division Gaithersburg, MD, USA

- System integration websocket services between a Unity Virtual Reality application and a UR5 Robot.
- Create drivers to use Manus VR hand controllers for Unity.
- Integrate different control mechanisms for controlling the UR5 robot such as HTC Vive Pro VR controllers, Manus VR hand controllers, and traditional mouse interface.
- Released the project as an open-source repository and project report.

National Institute of Standard and Technology (Dr. Jeremy Marvel) May 2018 – August 2018

Summer Undergraduate Research Fellow; Intelligent Systems Division Gaithersburg, MD, USA

- System integration websocket services between a Unity Android app and a UR5 Robot.
- Integrated measurement services to observe operator patterns while using the app for observation of heatmap and preferred user interface layouts.
- Released the project as an open-source repository and project report.

Selected Open Source Projects

Synthetic Environments for Non-deterministic SLAM Evaluation (SENSE) Aug. 2024 – Present

Dissertation Work TBD

- Open-source tool used for rendering synthetic images from an environment. This tool is a dedicated solution developed to collect images on the same camera setup and instructed path. This tool can collect images with a systematically developed set of camera configurations and environmental properties. More information is to come once the associated paper is released. This tool was developed in Unity along with a series of pipeline utilities such as Python scripts and Unix bash files.

xrtlab/CLOVR Fall 2023 – Spring 2024

Extended Reality and Training Laboratory github.com/xrtlab/clovr

- Developed an open-source solution for OpenVR motion data capture, utilizes Unity and calling Open Broadcasting Software for video and audio capture. User can see in real-time what the participant is seeing and record at any point. Component to a workshop I presented for IEEE VR 2024.

xrtlab/RecolorCloud Fall 2022 – Spring 2024

Extended Reality and Training Laboratory github.com/xrtlab/RecolorCloud

- Developed a Python-based UI and tool that can perform multiple operations to point clouds. Uses Open3D, Numpy, and Qt5py for the user interface.

OvercodedStack.github.io Present

Personal Work https://github.com/OvercodedStack/OvercodedStack.github.io

- Simple website to test out Javascript experiments. Publishes basic information about myself and occasionally some news updates.

COVID-19-Genome-Sequencing-with-DeepGRU Fall 2022

CAP 6545: Machine Learning for Biomedical Data github.com/OvercodedStack/COVID-19-Genome-Sequencing-with-DeepGRU

- Utilized a forked version of the VR motion recognition algorithm, DeepGRU, to detect patterns of genomes to recognize patterns within a genome to determine its ancestry to other similar viral genomes. Final report in repository.

ANDROID_UNITY_UI-Summer-2019-NIST Summer 2019 – Fall 2019

Intelligent Systems Division https://github.com/OvercodedStack/ANDROID_UNITY_UI-Summer-2019-NIST/tree/Android-Branch-2

- Utilized a forked version of the Unity-Test-Scenario-UR5-ManusVR-HTC-VIVE environment to call the UR5 robot. Integrates all capabilities through the Android app to forward commands and communication through websocket communications.

Unity-Test-Scenario-UR5-ManusVR-HTC-VIVE Summer 2018 - Fall 2018

Intelligent Systems Division github.com/OvercodedStack/Unity-Test-Scenario-UR5-ManusVR-HTC-VIVE

- Unity application that can control a virtual representation of a UR5 robot through direct interaction with VR controllers, Manus VR gloves, or in-game mouse control. All actions are recorded and stored for observation.

C# API Implementation ManusVR Summer 2018 - Fall 2018

Intelligent Systems Division github.com/OvercodedStack/C-Sharp-API-Implementation-ManusVR

- C# Driver used by Unity to interface with the Manus VR handheld controllers. Integrates directly with the ManusVR SDK to deliver all potential calls from the Manus VR SDK and phrase them into Unity for ease of use.

Volunteer Experience

Lab Mentor and Guidance for XRT Lab Undergraduates and Graduates	2022 - Present
Proposal Reviewer for Summer Undergraduate Research Fellowships at UCF	2023 - 2024
Camp Connect at UCF – Topic name: "Visualizing Point Clouds"	2022

Memberships and Collaborations

IEEE Member	2024
Evolutionary Computation Laboratory at the University of Central Florida (Affiliated)	2020 - 2025
Extended Reality and Training Laboratory (XRT) at the University of Central Florida (Prior Primary Affiliation)	2022 - 2024
Interactive Computing Experiences Research Cluster at the University of Central Florida (Collaboration)	2023

Honors

Chair for Workshop on Capturing and Logging Ecological Virtual Experiences and Reality (CLEVER) at IEEE VR 2024	2024
Winner of Google- Computing Alliance of Hispanic-Serving Institutions Dissertation Award	2023
Presented at National Institute of Standards and Technology (NIST) Summer Undergraduate Research Fellowship	2018, 2019
Awarded Grant from National Aeronautics and Space Administration (NASA) through the Florida Space Grant Consortium	2016

Skills

Programming Languages: **C, C++, C#,** Java, **Python**, Matlab, R, 3DsMax Scripting, **Bash**, Assembly, LUA, Javascript, SQL, HTML-5

Tech Skills: Software reverse engineering, Virtual Reality Visualization, Applied Artificial Intelligence, Simulation and Modeling, Asynchronous Data Collection and Storage, Evolutionary Computation systems, Docker, Robotics sensing, Simultaneous Localization and Mapping, virtual environments for synthetic data creation.

Software Architectures or Architectures: Unity, Unreal, Android, Occlus, Pytorch, Tensorflow, Matplotlib, QT5/6, OpenCV, Robot Operating System (ROS 1, 2), OpenXR, OpenVR, Web Application integration Online or Interprogram communication, and SPSS.

Other: 3D Modeling and Optimization, 3D printing and operation, video game model optimization, video game creation and testing, benchmark development testing for SLAM.