JONATAN MARTÍNEZ MUÑOZ

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Summary

Senior XR & Real-Time Graphics Engineer
PhD in Haptics with 15+ years building XR systems end-to-end. Strong background in low-latency streaming, sensor fusion, SLAM/alignment, computer vision, and cross-device XR. Hands-on with Unity/C#, Python, C++, WebRTC, OpenXR abstractions, and real-time 3D reconstruction.

Selected R&D Projects

XR Telepresence & Spatial Capture

- Designed "Ghost", an XR system where a remote user can inspect and move through another user's environment in real time.
- Implemented RGB/depth streaming, spatial mesh capture, and real-time textured reconstruction.

XR Input SDK Development (Lemonity)

- Developed and published a custom cross-platform Unity plugin in C++ / C# to interface with Leap Motion.
- Created robust abstractions for hand-tracking, spatial manipulation, and camera control, optimizing input latency.

Professional Experience

Lead R&D Engineer – Auger Groupe Conseil (AGC) Nov 2020 – Dec 2025

- Led "Ghost", a multiplatform, **OpenXR** based volumetric telepresence platform for remote collaboration in physical spaces.
- Developed **custom SLAM** algorithms and **native C++ plugins** for real-time depth map fusion and dynamic texture mapping
- **Reconstruction & Spatial Mapping:** Implemented on-device depth fusion into textured geometry for interactive latency and frame-rate budgets.
- **Coordinate Alignment:** Developed rigid-body registration (Kabsch + fiducials) to align remote 3D environments with local physical space.
- **Device & Cloud Integration:** Supported HoloLens, Quest, and Digilens; integrated cloud transfer for spatial meshes and shared assets.
- **Surgical Tool Tracking:** Integrated YOLO-based detection/segmentation plus camera calibration for AR alignment.
- **Gaussian Splatting:** Prototyped real-time incremental Gaussian Splatting for more realistic remote rendering using custom shaders.

Haptics Engineer & Researcher – Ultrahaptics Jan 2017 – Oct 2019

- Researched haptic rendering for volumetric and hand-centric XR interaction.
- Built award-winning Unity demos (Feels Like Magic, H-Reality Project) showcasing low-latency, device-driven interaction.
- Implemented dynamic ultrasound focal-point control and mesh edge/corner extraction.

- Developed soft-body, gaseous-object, and texture-rendering demos using dual-array configurations.

CTO – Neurodigital Technologies Oct 2014 – Nov 2016
- Created and productized the vibrotactile data gloves Gloveone and Avatar VR.
- Owned electronics bring-up, STM32 firmware, Windows C++ driver, and low-level device integration.
- Implemented inertial tracking and drift-correction algorithms for wearable XR interaction.
- Designed haptic algorithms and interaction techniques for demos and product showcases.

R&D Engineer / Researcher – UCLM & Eurocopter (Airbus Helicopters) 2007 – 2014
- Developed vibrotactile gloves, VR interaction techniques, and virtual-cockpit avionics simulators (MCDU, DMAP).
- Built C++/OpenGL/Ogre prototypes for haptic interaction, and immersive virtual environments.

Education

Ph.D. Human-Computer Interaction – UCLM (2010 – 2014)
Thesis: A Vibrotactile Prototyping Toolkit for Virtual Reality and Videogames

Master Engineering in Advanced Computer Science – UCLM (2008 – 2010)
Master thesis: Study and Improvement of Tactile Feedback in Virtual Environments

Bachelor Engineering in Computer Science – UCLM (2002 – 2007)
Final project: Design and implementation of an immersive system and a vibrotactile data glove

Core Technical Competencies

- **XR & Spatial Computing**: Unity, HoloLens / Quest / Digilens, real-time 3D reconstruction, spatial alignment, volumetric capture, OpenXR, OpenGL.
- **Streaming & Distributed Systems**: WebRTC, Photon, Azure Blob, synchronized RGB/depth/audio pipelines.
- **Computer Vision & Geometry**: Camera Calibration, Stereo Vision, OpenCV, ArUco / fiducials, YOLO, Object Tracking.
- **Applied Math & Algorithms**: SLAM, Kabsch (SVD), PnP, Kalman Filtering, Triangulation, Rigid Body Dynamics.
- **Software Engineering**: C++, Python, C# (Unity), Git, cross-platform real-time development.
- **Embedded & XR Peripherals**: Firmware (STM32, Nordic NRF, AVR), haptic devices.

Honors and Awards

- **Innovation award** – Technical demo *Feels Like Magic* (Ultrahaptics) - VR Summit Salzburg (Oct 2017)
- 3-years **fellowship Torres Quevedo** - Ministerio de Economía y Competitividad (Spain) (2014 – 2016)
- 4-years **Ph.D. fellowship** by Junta de Comunidades de Castilla-La Mancha (2008 – 2012)
- Best final project award - Degree in Computer Science – CCM (2007)
- **Finalist of the National Math Competition** Matenet 2002 – University of Navarra (2002)
- Honors qualification (Bachelors) (2002)

Languages

Spanish	Native
English	Professional Proficiency