

Mario A. Camarena

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EDUCATION

Texas Southmost College

High School Dual Enrollment

Aug 2017 – May 2021

GPA: 3.0/4.0

The University of Texas Rio Grande Valley

Bachelor of Science, Computer Science

May 2021 – May 2025

GPA: 3.4/4.0

The University of Texas Rio Grande Valley

Master of Science, Computer Science

June 2025 – Present

EXPERIENCE

Undergraduate Research Assistant

UTRGV Civil Engineering Department

Feb. 2024 – Present

Edinburg, TX

- Spearheaded FT-SAM dual-encoder model combining SAM with ResNet50, achieving 29% performance improvement in urban scene segmentation for autonomous vehicle applications.
- Implemented deformable decoder with hybrid loss functions (Focal+Dice+Lovász+Surface), optimizing boundary detection and class imbalance handling across 19 semantic classes.
- Led comprehensive human subject testing in a driving simulator, processing behavioral data for a Graph Convolutional Network (GCN) model to predict driver emotional responses, and support the development of emotion-aware autonomous systems.

Research Experience for Undergraduate (REU) Program

The University of California, Riverside

Jun. 2024 – Aug. 2024

Riverside, CA

- Collaborative research. Partnered with a Ph.D. mentor to evaluate advanced image segmentation models (SAM, Generalized SAM, DeepLabV3, YOLOv4) using real-world data, driving data-informed enhancements for autonomous technology.
- Insightful model benchmarking. Conducted a detailed comparative analysis of SAM versus state-of-the-art models, identifying unique strengths and limitations to provide actionable insights for optimal model selection in real-world autonomous applications.

PROJECTS

STABLES – Simulated Management Parking App | Flutter, Node.js, PostgreSQL, Python

Project Lead & Lead Developer

- Led 4-person team delivering cross-platform mobile app managing 800+ parking spots across 3 campus lots with real-time availability tracking, interactive spot reservation, and time-based synthetic data generation.
- Architected full-stack system with Flutter frontend, Node.js/Express API, PostgreSQL database, and a Python simulation script featuring bilinear interpolation for GPS mapping, ray-casting for spatial detection, and atomic conflict prevention.
- Demonstrated technical leadership through architectural decision-making, code reviews, and quality standards while adapting project management approach from Agile methodology to direct task delegation

Online Portfolio – Interactive Website | Next.js, TypeScript, PostgreSQL, Framer Motion, Tailwind CSS

Live: marioacamarena.com

- Developed interactive portfolio featuring advanced animations and 3D effects including magnetic button interactions, real-time typewriter sequences, floating particle canvas, and smooth scroll-triggered animations that showcase both technical skills and attention to user experience
- Built full-stack contact system with PostgreSQL database integration, form validation, and password-protected admin dashboard featuring submission analytics and real-time data visualization, ensuring proper handling of user contact information
- Designed responsive interface with performance-optimized animations, mobile-first approach, and intuitive user experience that showcases both technical skills and attention to visual design details.

Custom PC Builds and Mobile Device Repair | Hardware Assembly & Troubleshooting

Independent Technical Project

- Consulted with customers to assess performance needs and budget, then built custom systems, from gaming rigs to home-office systems managing, component selection, system tuning, and cooling setups.
- Troubleshoot and repaired smartphones, including screen replacements, battery swaps, and water-damage recovery.
- Performed routine maintenance and general system optimization to enhance system reliability and longevity.

Skills

Languages: Python, JavaScript/TypeScript, Dart, C++, Ruby, Rust, HTML, CSS

Frameworks & Libraries: Flutter, React, Next.js, Node.js/Express, PyTorch, TensorFlow, Chart.js, Framer Motion, Tailwind CSS

Databases & Data: PostgreSQL, SQLite

Tools & Platforms: Git & GitHub, Google Cloud Platform, Jupyter Notebooks, VSCode, Linux (Ubuntu/CentOS), Windows, HPC clusters