

Mario A. Camarena

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EDUCATION

The University of Texas Rio Grande Valley (UTRGV)

Master of Science, Computer Science

The University of Texas Rio Grande Valley (UTRGV)

Bachelor of Science, Computer Science

Texas Southmost College (TSC)

High School Dual Enrollment

Jun 2025 – Present

Expected May 2027

May 2021 – May 2025

GPA: 3.4/4.0

Aug 2017 – May 2021

GPA: 3.0/4.0

EXPERIENCE

Artificial Intelligence Research Assistant

UTRGV MECIS (NSF CREST), Dept. of Civil Engineering

Feb 2024 – Present

Edinburg, TX

- **Improved urban-scene segmentation accuracy by 29%** for autonomous driving use cases by leading a custom "AD-SAM" dual-encoder effort from dataset prep to evaluation. *Pending publication on IEEE-T-ITS*
- **Reduced boundary errors and class-imbalance misses** by adopting a deformable decoder and hybrid loss (Focal, Dice, Lovász, Surface), improving per-class consistency across 19 classes.
- **Ran a driving-simulator study**, managing logistics, data collection, data cleaning, and human subject testing. With the goal of testing on a Graph Convolutional Network (GCN) model to predict driver emotional responses, and support the development of emotion-aware autonomous systems.

Machine Learning Intern (REU)

University of California, Riverside

Jun 2024 – Aug 2024

Riverside, CA

- **Benchmarked segmentation models** (SAM, G-SAM, DeepLabV3, UNET, YOLO-based baselines) on real-world data and summarized trade-offs to guide model selection in autonomy applications.
- **Conducted a comparative analysis** of performance; collaborated with a Ph.D. mentor on reporting for reproducible results.

PROJECTS

STABLES — Simulated Parking Management App | Flutter, Node.js/Express, PostgreSQL, Python

Project Lead & Lead Developer | Live: [stables-utrgv-parking-app.web.app](#)

- **Shipped a cross-platform app managing 800+ parking spots across 3 lots** with live availability and reservations; led a 4-person team end-to-end.
- **Built the backend** (Node.js/Express + PostgreSQL) and a **Python simulator** generating time-based synthetic data for realistic load testing.
- **Implemented GPS mapping, spatial checks (ray-casting), and double-booking prevention**; enforced code review standards and task ownership.

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

Live: [mario-camarena.netlify.app](#)

- **Built an interactive portfolio** with advanced animations (magnetic buttons, typewriter sequences, floating particle canvas, scroll-triggered effects) to showcase projects and research work.
- **Implemented a full-stack contact system** with PostgreSQL, validation, and a protected admin dashboard featuring submission analytics and real-time charts.
- **Optimized responsive performance and UX** across mobile/desktop using Tailwind + Framer Motion and careful animation budgeting.

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

Freelance Hardware Technician

- **Delivered custom PCs tailored to budget and performance needs**, scoped requirements with customers; handled component selection, system tuning, and cooling design across gaming rigs and home-office builds.
- **Diagnosed and repaired smartphones end-to-end** including screen replacements and battery swaps.
- **Set expectations with clear estimates and approvals**; provided written quotes, timelines, and status updates.

SKILLS

- **Languages:** Python; JavaScript/TypeScript; Dart; C++; Rust.
- **ML:** PyTorch; TensorFlow; Jupyter; CUDA (exposure); model evaluation.
- **Web/App:** React; Next.js; Flutter; Node.js/Express; Ruby; Tailwind CSS; Framer Motion.
- **Data/Infra:** PostgreSQL; SQLite; Git/GitHub; Google Cloud Platform; Linux.