

Gray (Matthew) Marshall

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EDUCATION

The University of Texas at Austin

Austin, TX

B.S. Computer Science

Expected May 2028

- **Relevant Coursework:** Data Structures, Algorithms, Operating Systems, Computer Architecture, Machine Learning

EXPERIENCE

Autonomous Systems Lead

Jul 2026 – Present

Longhorn Racing Electric (Formula SAE)

Austin, TX

- Founded and lead the team's first autonomous driving program, authoring the approved 2026–27 retrofit roadmap and owning architecture, delivery, colcon CI on GitHub Actions, a Docker dev container, and the docs.lhre.org onboarding site.
- Built a 10-package ROS 2 Jazzy driverless stack solo (3.7K lines of Python, 25 topics, 65 parameters): Euclidean-clustering LiDAR cone detection, Delaunay centerline planning, and 20 Hz pure-pursuit control with curvature-adaptive lookahead.
- Engineered a simulation-first pipeline with Catmull-Rom procedural tracks, FOV-limited sensor simulation, a five-state FSAE mission state machine, and swappable kinematic and Gazebo Harmonic physics backends behind one ROS 2 topic surface.

Telemetry Software Engineer

Aug 2024 – Jul 2026

Longhorn Racing Electric (Formula SAE)

Austin, TX

- Co-built the team's telemetry system: Rust daemons on a Pi CM5 sample 71 CAN packets (195 signals, up to 333 Hz) into 100 Hz protobuf snapshots, uplinked over cellular MQTT into Kafka, gRPC, PostgreSQL, and 39 Grafana dashboards.
- Owned the Next.js and React web tool as its top contributor, shipping the Kafka-backed live viewer that streams about 190 channels over Server-Sent Events at 20 Hz, replay, auth, and full mobile support used by strategists and the driver.
- Created the in-car driver dashboard: React screens fed by a Rust daemon over Unix-socket IPC and a 30 Hz WebSocket, deployed as an 800x480 Chromium kiosk on the Pi (systemd, Plymouth, 6.5 s boot) and carried through first light on the car.

Lead Engineer, Recruiting Platform

Feb 2026 – Present

Longhorn Racing

Austin, TX

- Lead engineer of lhrrcruiting.org, the Next.js 16, TypeScript, and Firebase platform running recruiting for UT's three Formula SAE teams: 2,340 applications from 983 applicants across 26 subsystems, reviewed by 172 staff; 44% of the codebase.
- Built its correctness and operations layer: Firestore transactions with optimistic-concurrency 409s, idempotent step sweeps, a lock-serialized AWS SES runner (2,096 decision emails in one wave), a 14-action audit log, and 12 regression suites.

Founder

Mar 2026 – Present

PitLane Systems

Austin, TX

- Founded PitLane Systems to build broadcast software for sim racing leagues; selected as a 2026 McCombs Entrepreneur Summer Fellow at UT Austin and named Official Broadcasting Partner and Gold Tier Sponsor of the LoneStar Cup.
- Architected PitLane Director AC (Electron, TypeScript) for one-operator race broadcasts: a CSP Lua sidecar streams telemetry at 10 Hz over WebSocket, fused with Win32 shared memory via koffi FFI, driving OBS through 30 obs-websocket calls.
- Built the AI director that scores race action every 100 ms across battles, incidents, and pit stops to cut cameras, plus 17 overlays, RFC 8628 device activation, Stripe subscriptions, RSA-2048 JWT licensing, and auto-updates over Cloudflare R2.

Co-Founder & CTO

Apr 2026 – Present

Trophy Sim Solutions

Austin, TX

- Co-founded an LLC building sim racing systems for motorsport teams and training facilities; sole engineer on its live Next.js 16, TypeScript, and Neon Postgres platform (30K lines, 195 commits, 462 indexed URLs, 21 JSON-LD entity types).
- Built a parts configurator over a 429-product, 90-brand catalog (\$295K MSRP) with a 13-rule compatibility engine across 17 categories and 74 typed spec fields, base62 build permalinks, and a nightly cron logging 12,083 price snapshots.

Co-Founder & CTO

Mar 2025 – Present

Longhorn Sim Racing

Austin, TX

- Co-founded Longhorn Sim Racing and built its Next.js 16 and Postgres platform (346 commits, 47 Prisma models) for 170+ members: race-condition-safe registration with SELECT FOR UPDATE locks, Stripe webhooks, and a Shopify GraphQL store.

SELECTED PROJECTS

Invest Check (contract via PitLane Systems) | Next.js 16, Drizzle, Neon Postgres, Better Auth, Stripe

Apr – Jul 2026

- Sole engineer on a live verified-trading marketplace (45K lines, 61 trader profiles, 1,900+ trades): three Stripe checkout modes, a SnapTrade brokerage integration with an idempotent average-cost lot-pairing engine, and DocuSign onboarding.

AgentWorkspaces | Cloudflare Workers, Durable Objects, Workers AI, React 19

Feb 2026

- Live real-time collaboration app on Cloudflare Workers and Durable Objects: WebSocket Hibernation with alarm-driven stale-socket culling, a 22-message-type sync protocol, and a two-pass Workers AI (Llama 3.3 70B) loop with nine typed tools.

TECHNICAL SKILLS

Languages: TypeScript, Python, Rust, C, C++, Java, Swift, Go, SQL, Lua

Frameworks: React, Next.js, Node.js, Express, Electron, ROS 2, Prisma, Drizzle, Zod, SWR, Better Auth, Tailwind CSS

Systems: Distributed & real-time systems, Kafka, MQTT, gRPC, Protocol Buffers, WebSockets, CAN bus, Gazebo, LiDAR

Infra: PostgreSQL, Supabase, Neon, Firebase, Cloudflare, AWS, GCP, Docker, Bazel, GitHub Actions, Vercel, Grafana, Stripe

Developer Tools: Git, Linux/systemd, colcon, RViz2, PlotJuggler, Turborepo, PostHog, Sentry, Claude Code, Cursor, Codex