

# David Bernal

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## SUMMARY

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Software Engineer combining mission-critical discipline with modern .NET development. Currently supporting NASA missions as a contractor, with a focus on system verification and reliable engineering. Transitioning to full-time backend development with a strong portfolio in Event-Driven Microservices, Azure Serverless, and Cloud-Native Architecture.

## PROJECTS

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### AI-Powered Fantasy Sports Broadcaster | C#, .NET 8, Azure OpenAI, RabbitMQ 2025

- Architected a distributed event-driven system using RabbitMQ to decouple Python data ingestion scrapers from C# processing workers, ensuring high availability and fault tolerance.
- Integrated Azure OpenAI (GPT-4o) to analyze raw JSON game statistics and generate dynamic, personality-driven commentary scripts in real-time.
- Implemented Azure Cognitive Services (Neural TTS) to synthesize multi-voice audio broadcasts, applying SSML tags for emotional range and distinct character personas.

### Resilient Telemetry Ingestion Service | C#, .NET 8, RabbitMQ, SQL Server, Docker 2025

- Architected a fault-tolerant microservice system to ingest simulated IoT satellite telemetry data, designed to handle database outages without data loss.
- Engineered Reliability: Implemented a "Producer-Consumer" pattern using RabbitMQ with manual acknowledgments (autoAck: false), ensuring 100% data persistence even during service crashes.
- Containerization: Dockerized the entire stack (Sensor, Broker, Worker, Database) using Docker Compose, reducing local environment setup time from hours to less than 5 minutes.
- Cloud-Native Logic: Built "Smart Configuration" logic that automatically detects execution environments (Docker vs. Localhost) and applies retry policies for robust startup.

### Cloud-Native Live Portfolio Dashboard | Blazor WebAssembly, Azure Static Web Apps, GitHub Actions 2025

- Built a responsive Single Page Application (SPA) using Blazor WebAssembly, utilizing C# for client-side logic instead of JavaScript.
- Designed a custom service layer to authenticate and consume the GitHub REST API, dynamically rendering project statistics and repository status.
- Configured a robust CI/CD pipeline using GitHub Actions to automatically build, test, and deploy the application to Azure Static Web Apps on every commit.

## WORK EXPERIENCE

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### Spacecraft Software Test Engineer | HX5/NASA JETS Contract | Houston, Tx | Oct. 2023 – Present

- Automation: Developed Python scripts to extract project metrics from Jira/GitLab APIs, reducing weekly status reporting time by 40% and improving data accuracy for leadership dashboards.
- System Validation: Validated spacecraft software against rigorous functional requirements, authoring JSON-based test scripts that increased regression test coverage by approximately 25%.
- Code Integrity: Debugged and patched legacy C code to resolve critical data structure mismatches between message definition files and headers, preventing potential runtime failures in the simulation environment.

### Software Support Engineering Intern | GUARDIANS OF HONOR/NASA Contract | Houston, Tx | Jun. 2023 – Aug. 2023

- Configured and validated wireless access point capabilities for spacecraft network systems using OpenWRT firmware, testing WiFi band performance and multicasting functionality across configured network topologies to ensure efficient and reliable network communication
- Analyzed network traffic and performance using Wireshark to verify wireless communication protocols, documenting findings and configuration specifications for spacecraft Command and Data Handling systems to enhance protocol compliance and reliability
- Developed bash scripts to automate network testing and configuration tasks, streamlining validation processes for wireless network infrastructure to improve operational efficiency and reduce manual errors

### Software Engineering Intern | HX5/NASA JETS Contract | Houston, Tx | Feb. 2022 – Oct. 2023

- Tooling Impact: Developed a C++ packet parser that automated the translation of hexadecimal packet dumps into human-readable text.
  - Impact: This tool saved the lab team approximately 10+ engineering hours per week, transforming a tedious manual lookup process into an instant automated workflow.
- Validated theoretical network configurations using Time-Triggered Ethernet (TTE) switches for NASA customers, analyzing network behavior and presenting technical findings to stakeholders

- Maintained spacecraft avionics lab infrastructure by troubleshooting development hardware and software with limited documentation, ensuring continuous availability for testing operations

**TECHNICAL SKILLS**

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**Programming Languages:** Python, C#, SQL, Java, C++  
**Cloud & DevOps:** Azure (Functions, Blob, Event Grid, Service Bus), Docker, Kubernetes, CI/CD (GitHub Actions)  
**Architecture:** Microservices, Event-Driven Design, REST APIs, Serverless, Dependency Injection  
**Data:** SQL Server, Entity Framework Core, RabbitMQ, JSON Serialization  
**Tools:** Visual Studio, VS Code, Git, Postman, Wireshark, Jira, GitLab

**EDUCATION**

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<b>WESTERN GOVERNORS UNIVERSITY   Bachelor of Computer Science</b>	<b>November 2025</b>
<ul style="list-style-type: none"><li>● <i>Capstone:</i> Machine Learning Prediction System (Python/scikit-learn)</li></ul>	