Progress Evaluation 4

Remotely Controlled Car via LTE or Wi-Fi

• Christian Prieto, cprieto2023@my.fit.edu

• Joseph Digafe, jdigafe@my.fit.edu

• Nicholas Shenk, nshenk2023@my.fit.edu

• Donoven Nicolas, dnicolas2021@my.fit.edu

Faculty Advisor: Marius Silaghi, msilaghi@fit.edu

Progress of Current Milestone (Progress Matrix)

Task	Completion %	Christian	Joseph	Nicholas	Donoven
1. Controls + Motor Integration and packet structure, code organizaiton	85%	40%	0%	60%	0%
2.UI Revamp (Fullscreen + Overlays) and fallback deadman callback	80%	0%	50%	0%	50%
3. Hardware Motor Driver Wiring & Soldering, in the loop testing	100%	40%	0%	40%	20%

4. Motor Driver PWM Logic (Forward/Reverse switching), GPS field testing Just got it	90%	40%	0%	45%	15%

Task 1: Controls + Motor Integration

Motor command packets are decoded on the Raspberry Pi and converted into PWM signals to drive the motors. Safety logic was implemented to prevent invalid motor states and enforce dead-man behavior.

Christian assisted Nick extensively with hardware wiring, motor setup, and validation testing. Nick organized much of the control codebase and coordinated integration across system components. Both Nick and Christian performed GPS testing and outdoor field validation.

Task 2: UI Revamp (Fullscreen Video + Overlays) + fallback deadman

The UI now prioritizes fullscreen FPV video with telemetry overlays. The display layout was optimized and frame synchronization improved.

Joseph led the UI redesign and integration. Donovan assisted with layout testing and verification to ensure overlays remain synchronized with live video. Donovan also worked extensively on fallback deadman loopback.

Task 3: Hardware-in-the-Loop Testing

End-to-end testing combined live video streaming, encrypted control packets, and physical motor actuation.

Christian developed the encryption code used for secure communication and performed extensive Raspberry Pi testing. Nick assisted with organizing code structure and validating motor behavior under real operating conditions. Donoven supported hardware validation and integrated testing.

GPS testing and movement validation were conducted jointly by Nick and Christian.

Task 4: GPS + Field Testing

Outdoor testing validated vehicle control, video performance, GPS reporting, and safety behavior under real-world conditions.

Nick and Christian performed GPS testing and field driving validation. Packet-loss and connection interruption scenarios were introduced to verify panic-stop behavior and dead-man timer enforcement of dons controubtion.

Additional Algorithm Work

Donoven focused on developing the connection-loss tracing algorithm, which tracks communication failures and assists in debugging reconnect behavior.

Christian also served as draft planner for milestone documentation and overall system organization.

Contributions of Each Member

Christian Prieto

Assisted Nick extensively with hardware wiring and motor testing. Developed the encryption code for secure communication. Performed extensive Raspberry Pi testing, GPS field validation, and safety verification. Served as draft planner for milestone documentation and planning.

Joseph Digafe

Led UI redesign and fullscreen video integration. Implemented telemetry overlays and assisted with system testing.

Nicholas Shenk

Organized much of the control codebase. Led motor integration and assisted with hardware setup. Performed GPS testing and coordinated field validation with Christian.

Donoven Nicolas

Developed the connection-loss tracing algorithm and assisted with hardware-in-the-loop testing and system validation.

Plan for Next Milestone

Task	Nicholas	Christian	Joseph	Donoven
• Seamless Wi-Fi/LTE failover	Leading organzation on Pi	Network handling/ protocol validation	UI status indicators	Failover stress testing
Adaptive Video Bitrate/Full System Integration	Encoding logic	Testing & metrics	UI bitrate display	Performance testing
Begin Formal Evaluation	Safety Validation-	-Survey desighn	Latency metrics	Data collection

Discussion of Planned Tasks

1. **Seamless Wi-Fi/LTE Failover:**
   Implement automatic network switching logic without requiring session restart. Maintain session state across IP changes and ensure control channel stability during transitions.
2. **Adaptive Video Bitrate:**
   Introduce dynamic bitrate adjustment based on network conditions (packet loss, jitter, RTT). Improve video stability under LTE variability.
3. **Full System Integration:**
   Finalize integration of video, control, encryption, and relay components into a cohesive system. Focus on stability and long-duration session testing.
4. **Formal Evaluation & Testing:**
   Begin structured measurement of latency, reliability, and safety metrics based on evaluation criteria defined in the presentation
   Collect operator usability feedback and document performance results.

Meetings & Feedback

Faculty Advisor Meetings: Feb 23, 2026

Faculty Advisor feedback:
Task 1: Type text here
Task 2:
Task 3:
Tasl 4:

Evaluation by Faculty Advisor

Faculty Advisor Signature: Marius Silaghi Date: 02/23/26

Evaluation by Faculty Advisor

Faculty Advisor: detach and return this page to Dr. Chan (HC 209) or email the scores to pkc@cs.fit.edu

Member	0	1	2	3	4	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10
Nick Shenk																
Christian Prieto																
Joseph Digafe																
Donoven Nicolas																

Faculty Advisor Signature: _____ Date: _____