



UE22CS441A-- Capstone Project Phase - III - Weekly Status Report

Project Title	Detection And Mitigation Of Replay Attacks		
Batch No	49		
Week Starting Date	11/08/2025	Week Ending Date	17/08/2025
Name	Mohit Prasad Singh Shreyas Suresh Soumya Ranjan Mishra Suhas Venkata	SRN	PES2UG22CS320 PES2UG22CS540 PES2UG22CS571 PES2UG22CS590
Activities Completed			
#	Tasks	Date	Remarks
1	Set up project repository and folder structure.	12/08/2025	Repository initialized.
2	Installed Python, FFmpeg, OpenCV, and dependencies.	14/08/2025	Environment ready.
3	Conducted initial research on replay attack detection techniques.	16/08/2025	Research notes prepared.
In Progress			
#	Tasks	Date	Remarks
1	Drafting initial RTSP ingestion script.	Ongoing	Testing Connectivity
2	Collecting additional sample videos.	Ongoing	Exploring dataset
Plan for Next Week			
#	Tasks	Date	Remarks
1	Complete RTSP Ingestion Script	Plan	Ready for testing.
2	Begin Motion Detection Logic design	Plan	Prepare for crime window detection.

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Dr. M. Jayaram

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UE22CS441A-- Capstone Project Phase - III - Weekly Status Report

Project Title	Detection And Mitigation Of Replay Attacks		
Batch No	49		
Week Starting Date	18/08/2025	Week Ending Date	24/08/2025
Name	Suhas Venkata Soumya Ranjan Mishra Shreyas Suresh Mohit Prasd Singh	SRN	PES2UG22CS590 PES2UG22CS571 PES2UG22CS540 PES2UG22CS320
Activities Completed			
#	Tasks	Date	Remarks
1	Implemented basic RTSP stream ingestion.	19/08/2025	Captured frames successfully.
2	Tested live feed capture from local RTSP server.	21/08/2025	Stable connection.
3	Drafted motion detection logic outline.	23/08/2025	Ready for coding.
In Progress			
#	Tasks	Date	Remarks
1	Coding grid based motion detection	Ongoing	Using median + MAD.
2	Setting up test harness for detection.	Ongoing	Preparing sample runs.
Plan for Next Week			
#	Tasks	Date	Remarks
1	Complete motion detection implementation.	Plan	Detect abnormal motion.
2	Add safety margin logic.	Plan	Avoid clipping events.

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Project Title	Detection And Mitigation Of Replay Attacks		
Batch No	49		
Week Starting Date	25/08/2025	Week Ending Date	31/08/2025
Name	Suhas Venkata Soumya Ranjan Mishra Shreyas Suresh Mohit Prasd Singh	SRN	PES2UG22CS590 PES2UG22CS571 PES2UG22CS540 PES2UG22CS320
Activities Completed			
#	Tasks	Date	Remarks
1	Integrated grid-based motion detection.	26/08/2025	Working on sample videos.
2	Added safety margin logic.	28/08/2025	Event boundaries improved.
3	Started replay file generation module.	30/08/2025	Head-filler-tail logic drafted.
In Progress			
#	Tasks	Date	Remarks
1	Coding FFmpeg concatenation commands.	Ongoing	For replay file creation.
2	Testing on multiple video formats.	Ongoing	Ensuring compatibility.
Plan for Next Week			
#	Tasks	Date	Remarks
1	Complete replay file generation.	Plan	Produce output_no_crime.mp4.
2	Begin orchestration script for stream switching.	Plan	Automate swap at t_0 .

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Project Title	Detection And Mitigation Of Replay Attacks		
Batch No	49		
Week Starting Date	01/09/2025	Week Ending Date	07/09/2025
Name	Suhas Venkata Soumya Ranjan Mishra Shreyas Suresh Mohit Prasd Singh	SRN	PES2UG22CS590 PES2UG22CS571 PES2UG22CS540 PES2UG22CS320
Activities Completed			
#	Tasks	Date	Remarks
1	Completed replay file generation module.	02/09/2025	File plays correctly.
2	Orchestrated FFmpeg to swap streams at t_0 .	04/09/2025	Seamless switch achieved.
3	Tested replay injection on sample videos.	06/09/2025	Verified smooth playback.
In Progress			
#	Tasks	Date	Remarks
1	Refining stream switching timing for different network conditions.	Ongoing	Reduce latency during swap..
2	Preparing automation scripts for multi-video batch testing.	Ongoing	To speed up validation.
Plan for Next Week			
#	Tasks	Date	Remarks
1	Develop orchestration script for start/stop of streams.	Plan	Automate control.
2	Add ffplay auto-restart for reconnection.	Plan	Ensure viewer reconnects instantly.

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Project Title	Detection And Mitigation Of Replay Attacks		
Batch No	49		
Week Starting Date	08/09/2025	Week Ending Date	14/09/2025
Name	Suhas Venkata Soumya Ranjan Mishra Shreyas Suresh Mohit Prasd Singh	SRN	PES2UG22CS590 PES2UG22CS571 PES2UG22CS540 PES2UG22CS320
Activities Completed			
#	Tasks	Date	Remarks
1	Ensure viewer reconnects instantly.	09/0/2025	Automated control.
2	Developed orchestration script for start/stop of streams.	11/09/2025	Viewer reconnects instantly.
3.	Conducted multi-run replay switch tests.	13/09/2025	Stable under repeated runs.
In Progress			
#	Tasks	Date	Remarks
1	Final testing of replay attack simulation.	Ongoing	Measure swap delay and stability.
2	Preparing dataset for HTM training.	Ongoing	Curating clean and replayed samples.
Plan for Next Week			
#	Tasks	Date	Remarks
1	Implement preprocessing pipeline for HTM input.	Plan	Ready for integration.
2	Begin HTM model training.	Plan	Grayscale, resize, SDR encoding.

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Project Title	Detection And Mitigation Of Replay Attacks		
Batch No	49		
Week Starting Date	15/09/2025	Week Ending Date	21/09/2025
Name	Suhas Venkata Soumya Ranjan Mishra Shreyas Suresh Mohit Prasd Singh	SRN	PES2UG22CS590 PES2UG22CS571 PES2UG22CS540 PES2UG22CS320
Activities Completed			
#	Tasks	Date	Remarks
1	HTM training completed by teammate.	16/09/2025	Model parameters tuned.
2	Implemented preprocessing pipeline (grayscale, resize, SDR encoding).	18/09/2025	Ready for HTM input.
3	Connected RTSP ingestion to HTM for live anomaly scoring.	20/09/2025	Real-time detection working.
In Progress			
#	Tasks	Date	Remarks
1	Testing HTM detection accuracy on mixed streams.	Ongoing	Fine-tuning thresholds.
2	Designing decision logic for replay/clean branching.	Ongoing	Gatekeeper logic.
Plan for Next Week			
#	Tasks	Date	Remarks
1	Finalize HTM thresholds.	Plan	Reduce false positives.
2	Begin frame hashing module design.	Plan	For clean footage only.

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Project Title	Detection And Mitigation Of Replay Attacks		
Batch No	49		
Week Starting Date	22/09/2025	Week Ending Date	28/09/2025
Name	Suhas Venkata Soumya Ranjan Mishra Shreyas Suresh Mohit Prasd Singh	SRN	PES2UG22CS590 PES2UG22CS571 PES2UG22CS540 PES2UG22CS320
Activities Completed			
#	Tasks	Date	Remarks
1	Fine-tuned HTM thresholds for replay detection.	23/09/2025	Reduced false positives.
2	Added decision logic for replay/clean branching.	25/09/2025	Gatekeeper logic in place.
3	Designed frame hashing module.	27/09/2025	SHA-256 chosen.
In Progress			
#	Tasks	Date	Remarks
1	Coding frame hashing module.	Ongoing	Integrating preprocessing.
2	Designing metadata schema for hashes.	Ongoing	Include preprocessing params.
Plan for Next Week			
#	Tasks	Date	Remarks
1	Implement frame hashing module.	Plan	Test on clean footage.
2	Choose storage backend for hashes.	Plan	JSON vs SQLite.

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Project Title	Detection And Mitigation Of Replay Attacks		
Batch No	49		
Week Starting Date	29/09/2025	Week Ending Date	05/10/2025
Name	Mohit Prasad Singh Shreyas Suresh Soumya Ranjan Mishra Suhas Venkata	SRN	PES2UG22CS320 PES2UG22CS540 PES2UG22CS571 PES2UG22CS590
Activities Completed			
#	Tasks	Date	Remarks
1	Implemented frame hashing module using SHA-256.	30/09/2025	Frame hashing done
2	Researched and selected SQLite as the storage backend.	03/10/2025	Backend DB Ready
3	Implemented SQLite database connector and write logic.	05/10/2025	SQLite DB connected and being written to.
In Progress			
#	Tasks	Date	Remarks
1	Developing hash verification logic (DB read).	Ongoing	Testing Connectivity
2	Integrating verification logic with Gatekeeper module.	Ongoing	Exploring dataset
Plan for Next Week			
#	Tasks	Date	Remarks
1	Complete full integration of Gatekeeper and DB.	Plan	Ready for testing.
2	Conduct initial end-to-end system tests.	Plan	Prepare for crime window detection.

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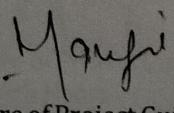
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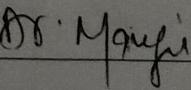
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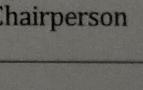
Project Title	Detection And Mitigation Of Replay Attacks		
Batch No	49		
Week Starting Date	06/10/2025	Week Ending Date	12/10/2025
Name	Suhas Venkata Soumya Ranjan Mishra Shreyas Suresh Mohit Prasd Singh	SRN	PES2UG22CS590 PES2UG22CS571 PES2UG22CS540 PES2UG22CS320
Activities Completed			
#	Tasks	Date	Remarks
1	Completed integration of Gatekeeper and SQLite DB.	09/10/2025	Integration working
2	Conducted end-to-end test with normal video.	11/10/2025	Desired results
3	Conducted end-to-end test with replay attack video.	12/10/2025	Results to be analyzed
In Progress			
#	Tasks	Date	Remarks
1	Optimizing database write performance.	Ongoing	Latency and writing accurate hashes and to DB
2	Designing a simple dashboard for alert visualization.	Ongoing	Frontend stuff
Plan for Next Week			
#	Tasks	Date	Remarks
1	Implement alert logging for dashboard.	Plan	Replay attack alerts
2	Develop simple dashboard viewer script.	Plan	Frontend integration


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Project Title	Detection And Mitigation Of Replay Attacks		
Batch No	49		
Week Starting Date	13/10/2025	Week Ending Date	19/10/2025
Name	Suhas Venkata Soumya Ranjan Mishra Shreyas Suresh Mohit Prasd Singh	SRN	PES2UG22CS590 PES2UG22CS571 PES2UG22CS540 PES2UG22CS320
Activities Completed			
#	Tasks	Date	Remarks
1	Implemented a real-time event mechanism for HTM alerts.	16/10/2025	Convert batch to stream processing of frames
2	Developed a simple console-based dashboard interface.	18/10/2025	Streamlit frontend
3	Integrated the live dashboard with the main orchestration logic.	19/10/2025	Streamlit integration with backend finished
In Progress			
#	Tasks	Date	Remarks
1	Testing the end-to-end alert delivery pipeline.	Ongoing	Testing for demo
2	Refining the orchestration script for a unified demo.	Ongoing	Demo prep for review
Plan for Next Week			
#	Tasks	Date	Remarks
1	Finalize the integrated system for the final demo.	Plan	Produce output_no_crime.mp4.
2	Begin drafting the final project report.	Plan	Automate swap at t_0

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Project Title	Detection And Mitigation Of Replay Attacks		
Batch No	49		
Week Starting Date	20/10/2025	Week Ending Date	26/10/2025
Name	Suhas Venkata Soumya Ranjan Mishra Shreyas Suresh Mohit Prasd Singh	SRN	PES2UG22CS590 PES2UG22CS571 PES2UG22CS540 PES2UG22CS320
Activities Completed			
#	Tasks	Date	Remarks
1	Finalized the integrated system and orchestration script	21/10/2025	Plan ready
2	Drafted Introduction section of the final report.	23/10/2025	Report section completed
3	Drafted System Architecture section of the report.	26/10/2025	Report section finished
In Progress			
#	Tasks	Date	Remarks
1	Drafting Methodology (HTM, Hashing, Gatekeeper logic) report section.	Ongoing	Report writing
2	Conducting tests and recording final performance metrics.	Ongoing	Prepare for testing phase
Plan for Next Week			
#	Tasks	Date	Remarks
1	Complete Methodology and Results sections.	Plan	Produce output_no_crime.mp4.
2	Prepare first draft of final presentation slides.	Plan	Automate swap at t_0 .

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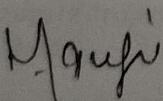
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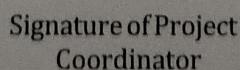
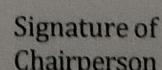
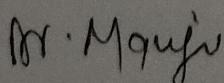
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Project Title	Detection And Mitigation Of Replay Attacks		
Batch No	49		
Week Starting Date	27/10/2025	Week Ending Date	02/11/2025
Name	Suhas Venkata Soumya Ranjan Mishra Shreyas Suresh Mohit Prasd Singh	SRN	PES2UG22CS590 PES2UG22CS571 PES2UG22CS540 PES2UG22CS320
Activities Completed			
#	Tasks	Date	Remarks
1	Completed Methodology section of the report.	29/10/2025	Report section completed
2	Completed performance tests and drafted Results section.	31/10/2025	Report section completed
3	Prepared first draft of final presentation slides.	02/11/2025	PPT draft done
In Progress			
#	Tasks	Date	Remarks
1	Drafting Conclusion and Future Work sections.	Ongoing	Report / PPT
2	Creating a recorded video of the final demo.	Ongoing	To avoid time delay during demo
Plan for Next Week			
#	Tasks	Date	Remarks
1	Complete final report draft for guide review.	Plan	Report
2	Refine presentation slides.	Plan	PPT



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Project Title	Detection And Mitigation Of Replay Attacks		
Batch No	49		
Week Starting Date	03/11/2025	Week Ending Date	09/11/2025
Name	Suhas Venkata Soumya Ranjan Mishra Shreyas Suresh Mohit Prasd Singh	SRN	PES2UG22CS590 PES2UG22CS571 PES2UG22CS540 PES2UG22CS320
Activities Completed			
#	Tasks	Date	Remarks
1	Conducted formal testing on a validation set of normal videos.	04/11/2025	Initial testing
2	Tested the pipeline against different replay attack types.	06/11/2025	Found few false +ve's
3.	Consolidated all initial performance results.	08/11/2025	Recorded results
In Progress			
#	Tasks	Date	Remarks
1	Analyzing results to identify cause of false positives.	Ongoing	-
2	Experimenting with new HTM parameter configurations.	Ongoing	To improve accuracy
Plan for Next Week			
#	Tasks	Date	Remarks
1	Re-train the HTM model with optimized parameters.	Plan	-
2	Re-run testing with new model	Plan	For better results

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Project Title	Detection And Mitigation Of Replay Attacks		
Batch No	49		
Week Starting Date	10/11/2025	Week Ending Date	16/11/2025
Name	Suhas Venkata Soumya Ranjan Mishra Shreyas Suresh Mohit Prasad Singh	SRN	PES2UG22CS590 PES2UG22CS571 PES2UG22CS540 PES2UG22CS320
Activities Completed			
#	Tasks	Date	Remarks
1	Re-trained the HTM model with new parameters.	11/11/2025	Model parameters tuned.
2	Re-ran baseline tests on the new model.	14/11/2025	Ready for HTM input.
3	Re-ran all attack scenario tests on the new model.	16/11/2025	Real-time detection working.
In Progress			
#	Tasks	Date	Remarks
1	Finalizing the "Results & Analysis" section of the report.	Ongoing	With new results
2	Cleaning up final code and adding comments.	Ongoing	Finishing up
Plan for Next Week			
#	Tasks	Date	Remarks
1	Compile all final deliverables.	Plan	For review and report
2	Prepare for final project review and demonstration.	Plan	-

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