Augmenting Foreign Materiel Exploitation

Improved data triage in reverse engineering through rapid Large Language Model (LLM) prototyping

The National Air and Space Intelligence Center Foreign Materiel Exploitation Squadron (NASIC FME) identified needs to build better tools to augment data triage for reverse engineering (RE). We referenced the Corpora IRAD to determine best practices for deploying LLMs within a secure environment. We then used the research from Corpora to enhance the software prototype Forest to augment data triage through the integration of a LLM to characterize files in a secure environment without user involvement.

Based on the capabilities of Forest, NASIC/GXF tasked us with developing Pandora to integrate data across the organization's RE tools to enable high-performance search and future LLM applications to revolutionize the RE process.

Process

We first referenced the Corpora IRAD and determined best practices for LLM deployment in secure, mission-specific environments. Areas for improvement were identified and prototypes developed:

Forest:

- 5-day software blitz: implemented significant code improvements and eliminated several critical bugs
- Conducted agile, sprint-based development to refine the codebase and develop LLM integration

Pandora:

- *5-day software blitz:* developed prototype integrating data and automating workflows for two RE applications
- Developed containerized application standard and container orchestration environment for RE tools
- *Quarterly release schedule:* deploying Pandora to mission environment in Q4 2025

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Key Features

- Forest: LLMs translate documents in foreign languages, summarize file contents, and auto-tag, serving as a force multiplier for data triage in recovered data devices
- Pandora: Enables Foreign Materiel Exploitation (FME) organizations to build custom workflows to integrate their data across their RE applications, enabling search and future LLM integration to augment and accelerate RE

Augmenting Foreign Materiel Exploitation



Pandora prototype overview

We deployed a two prototypes—Forest, a secure LLM for translation of documents in foreign languages, summarizing, and auto-tagging contents to serve as a force multiplier for data triage in recovered data devices, and Pandora to integrate data and enhance search and future LLM use across RE tools.

Next Steps

- Deploy the Forest prototype for multiple squadrons within NASIC
- Engage with the Joint FME Capabilities Working Group to distribute Forest to partnering service intelligence centers
- Deploy next release of Pandora in June 2025 to NASIC/GXF to enable high-performance search of current and past RE project data



Critical Tech Areas

















DoD Priorities

