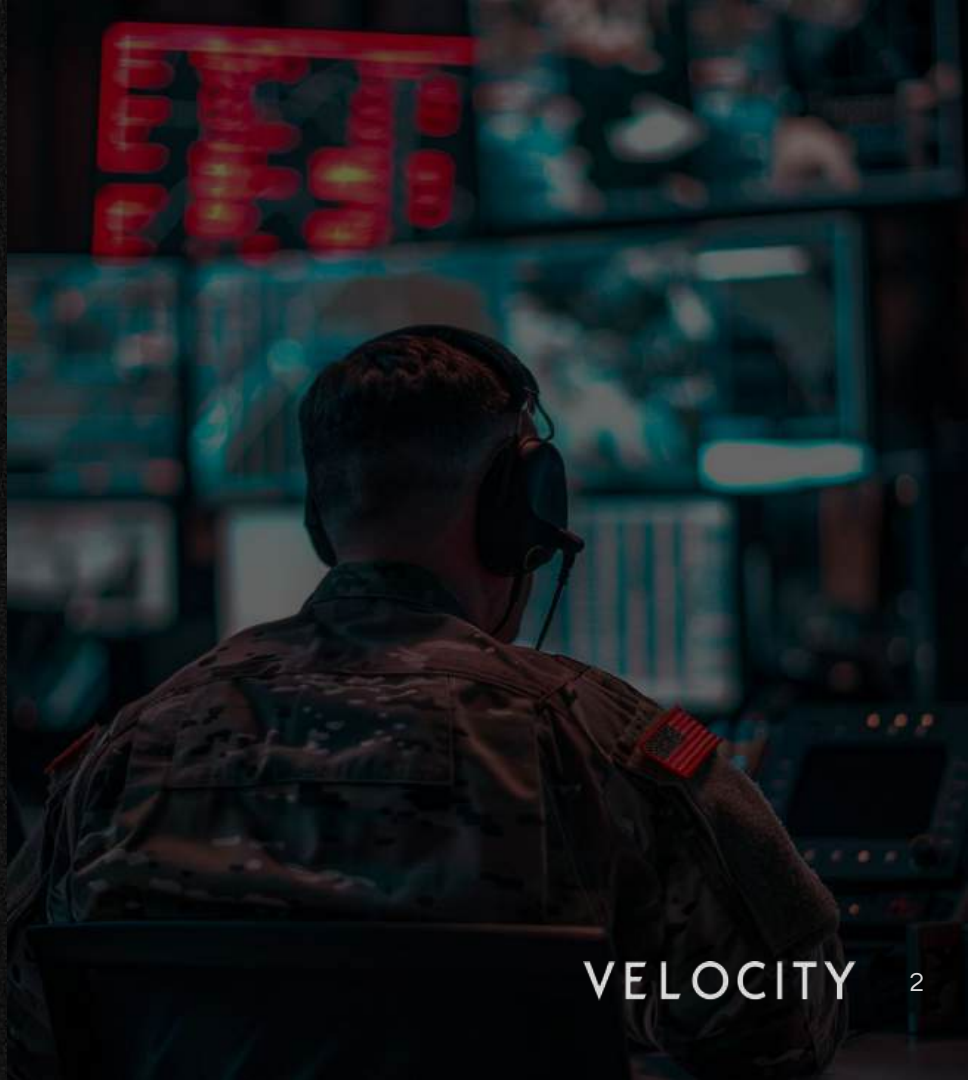
AI-POWERED SITUATIONAL AWARENESS

ENHANCING DOD COMM TOOLS FOR HIGH-STAKES MISSIONS

ALEC LEESEBERG
PRESIDENT
VELOCITY EXPLORATIONS

INTRODUCTION

- Military operations generate an increasing amount of data
- Process to make informed and timely decisions becomes increasingly complex
- Clear need for innovative solutions to enhance cognitive processing and decision-making capabilities
- Commercial sector has begun adopting Generative AI (Gen AI or GAI), particularly Large Language Models (LLMs) to tackle these challenges



The Problem

Meeting the Demands of Increasing Launch Cadence with Limited Resources

The Eastern Range is experiencing an unprecedented increase in launch frequency, with more missions and diverse launch providers coming online each year. This rise in demand is not matched by personnel growth, as manning levels for launch operations have plateaued or, in some cases, decreased. How can the range support a growing number of missions and providers with limited staffing?

VELOCITY

ChatOps + GenAI

Why ChatOps?

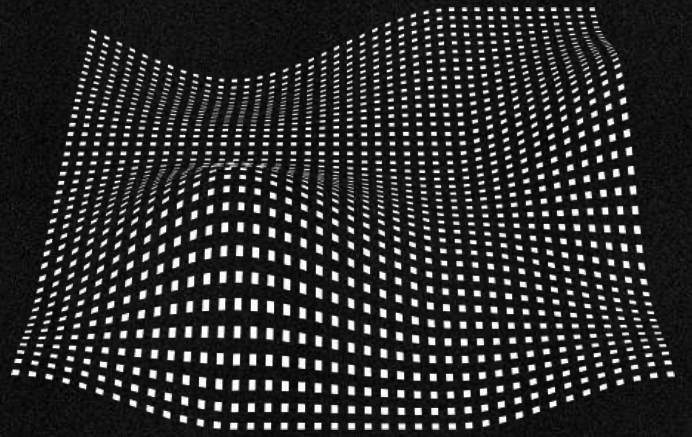
- ChatOps have already been adopted by some pockets of the military
- Improves communication and collaboration efficiencies compared to traditional methods such as email
- Range of operational classification levels
- Ability to access on personal devices (BYOD - classification contingent)

ChatOps as a GenAI Interface

- Same Generative AI interface (text box based chat)
- If already adopted, inclusion of GenAI can integrate seamlessly
- Chat history provides a contextual baseline. Simply by using the tool, GenAI has contextualized operational data to leverage
- Opportunity to deliver dynamic group interactions
- Open source product that can be tailored to fit evolving needs

Team Dynamics

- Introducing a GenAI into the Day of Launch (DoL) chat creates a new set of interaction dynamics
- Most modern GenAI workflows involve 1 user with 1 agent at a time
- In the context of DoL Chat, the team overall can interact with the bounded-omniscient and SME GenAI
  - Users can follow up to others' prompts
  - Visible and collaborative workflows helps spread adoption and training



1st Range Operations Squadron

- Already uses ChatOps extensively, including for missions
- Operates at CUI IL4 security level - excellent for cloud hosting
- Conducted on-console operations testing to understand how the tool would be used during a specific mission
- Initial testing uncovered the need for Tactical AI

Tactical GenAI

General vs Tactical GenAI

- User testing has revealed a major delta between off the shelf GenAI and end user needs in operational workflows
- Lack of access to operational data, and lack of contextualization to acronyms, terminology, and use case limit effectiveness of GAI operationally
- Need to develop “Tactical GAI” for operational units
  - LLMs with custom tooling specific to units and workflows that greatly improve end user value and ability to do complex workflow tasks
- Focus on building modular backend pieces for development of Tactical GAI

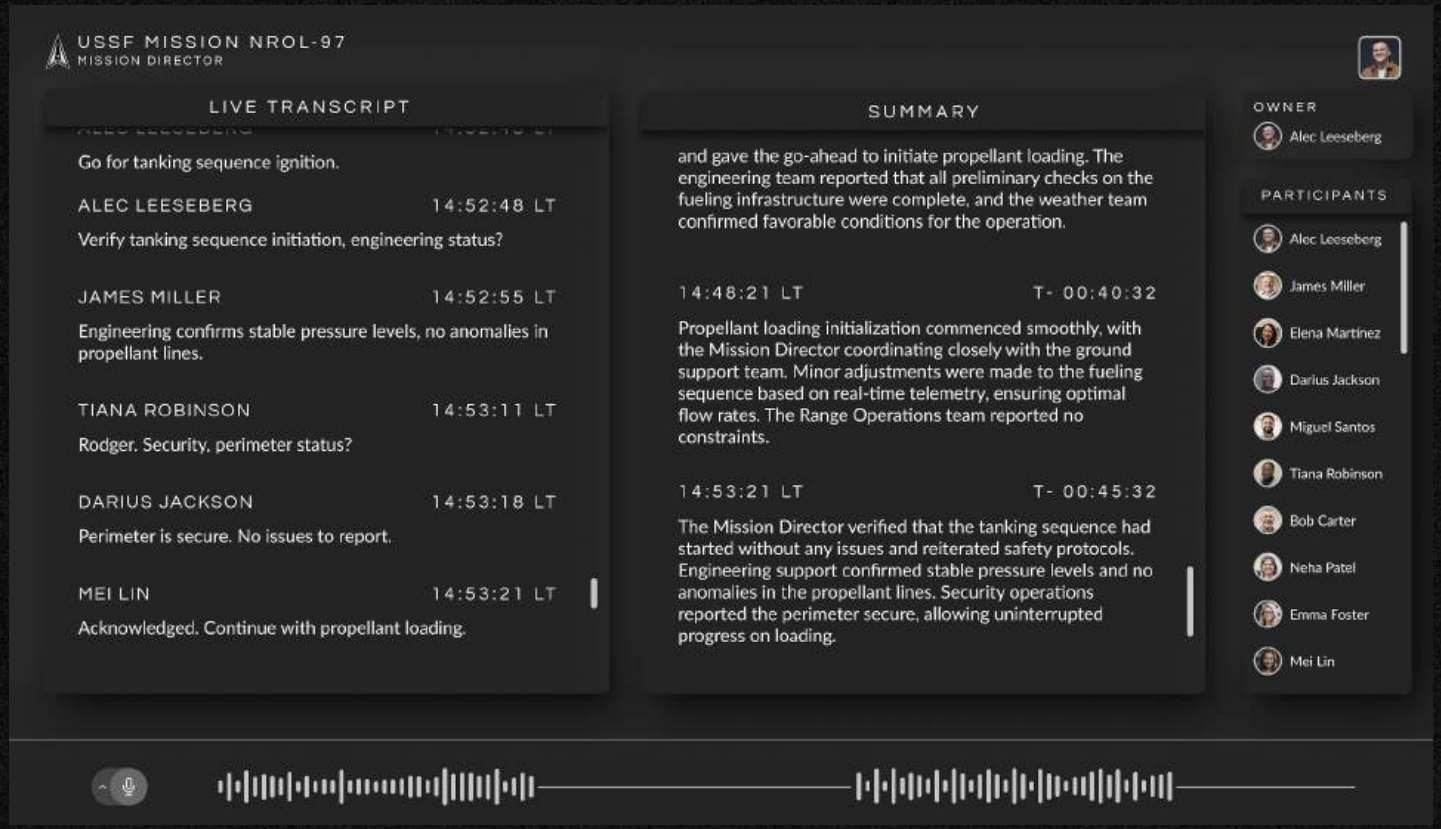
Benefits of Tactical GenAI

- GenAI Agents understand acronyms, terminology, and mission context
- Access to mission-relevant information not found in ChatOps
- Lower rates of hallucination and higher accuracy
- Lack of access to operational data, and lack of contextualization to acronyms, terminology, and use case limit effectiveness of GenAI operationally

Comm Net Transcription

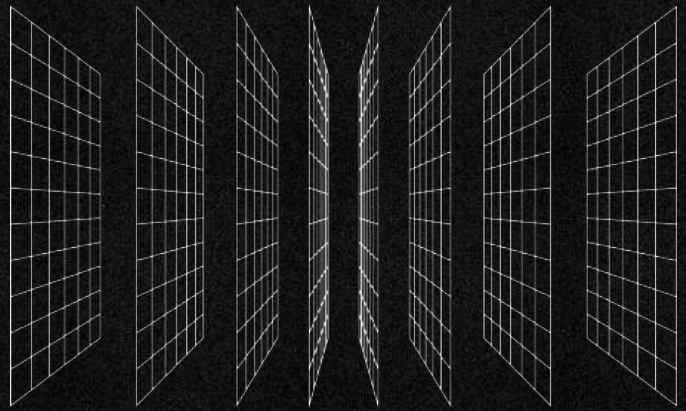
Creating a Communication Data Lake

- Large Language Models are most effective at indexing and creating human language
- Limiting integration to just ChatOps misses the majority of communication data for a given operation
- Creating a “comm data lake” (i.e. the combined dataset of all communications used during the mission) allows GenAI to be able to maintain the highest level of situational awareness
- Need to create VOIP transcription tool


USSF MISSION NROL-97
MISSION DIRECTOR
LIVE TRANSCRIPT
Go for tanking sequence ignition.
ALEC LEESEBERG 14:52:48 LT
Verify tanking sequence initiation, engineering status?
JAMES MILLER 14:52:55 LT
Engineering confirms stable pressure levels, no anomalies in propellant lines.
TIANA ROBINSON 14:53:11 LT
Rodger. Security, perimeter status?
DARIUS JACKSON 14:53:18 LT
Perimeter is secure. No issues to report.
MEI LIN 14:53:21 LT
Acknowledged. Continue with propellant loading.
SUMMARY
and gave the go-ahead to initiate propellant loading. The engineering team reported that all preliminary checks on the fueling infrastructure were complete, and the weather team confirmed favorable conditions for the operation.
14:48:21 LT T- 00:40:32
Propellant loading initialization commenced smoothly, with the Mission Director coordinating closely with the ground support team. Minor adjustments were made to the fueling sequence based on real-time telemetry, ensuring optimal flow rates. The Range Operations team reported no constraints.
14:53:21 LT T- 00:45:32
The Mission Director verified that the tanking sequence had started without any issues and reiterated safety protocols. Engineering support confirmed stable pressure levels and no anomalies in the propellant lines. Security operations reported the perimeter secure, allowing uninterrupted progress on loading.
OWNER
Alec Leeseberg
PARTICIPANTS
Alec Leeseberg
James Miller
Elena Martinez
Darius Jackson
Miguel Santos
Tiana Robinson
Bob Carter
Neha Patel
Emma Foster
Mei Lin

"Bound-Omniscience"

- GenAI has the ability to sift through and reference vast arrays of data inside ChatOps and Mission Transcript
- Additional operational data can be added in for the GenAI to reference
- This confluence of operational data gives the GenAI the characteristics of "bound-omniscience" over its walled garden of data and situational awareness
- End users can ask questions regarding other operations and drastically improve their ability to process the available data



On-Console Testing

LLM Hallucinations

- One of the biggest challenges to adopting GenAI within DoD operations is the risk of LLM Hallucinations (instances in which the LLM generated incorrect of false information)
- Could be catastrophic in operational scenarios
- NOT ACCEPTABLE at rates that exceed those of human counterparts
- Risk levels vary in different operations, but hallucinations are the single most critical limiting factor to address in integrating within operational scenarios

Need for Data Cleanup

- GenAI is not a fix-all solution and should be used in particular situations for particular tasks
- Risk of hallucinations dramatically increases as lack of structured data increases
- Asking a GenAI to RAG or Vector Search unstructured data resulted in a “hallucination machine”
- Solution: fix your data posture first, and then add the GenAI

CONTRIBUTING ORGANIZATIONS

Q&A

GET IN TOUCH

SCAN FOR LINKEDIN

ALEC LEESEBERG

PRESIDENT
VELOCITY EXPLORATIONS

alec@velocityexplorations.com

www.velocityexplorations.com

www.kineticchat.com

ADVANCED DATA PROCESSING

AND THE EVOLVING ROLE OF THE WARFIGHTER

ALEC LEESEBERG
PRESIDENT
VELOCITY EXPLORATIONS