AI-Enabled Social Cyber Maneuver Detection and Creation

Matthew Hicks

Thesis Proposal

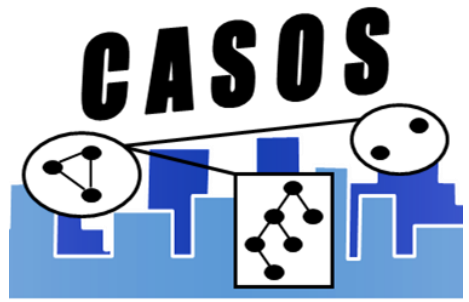
Spring 2024

Committee

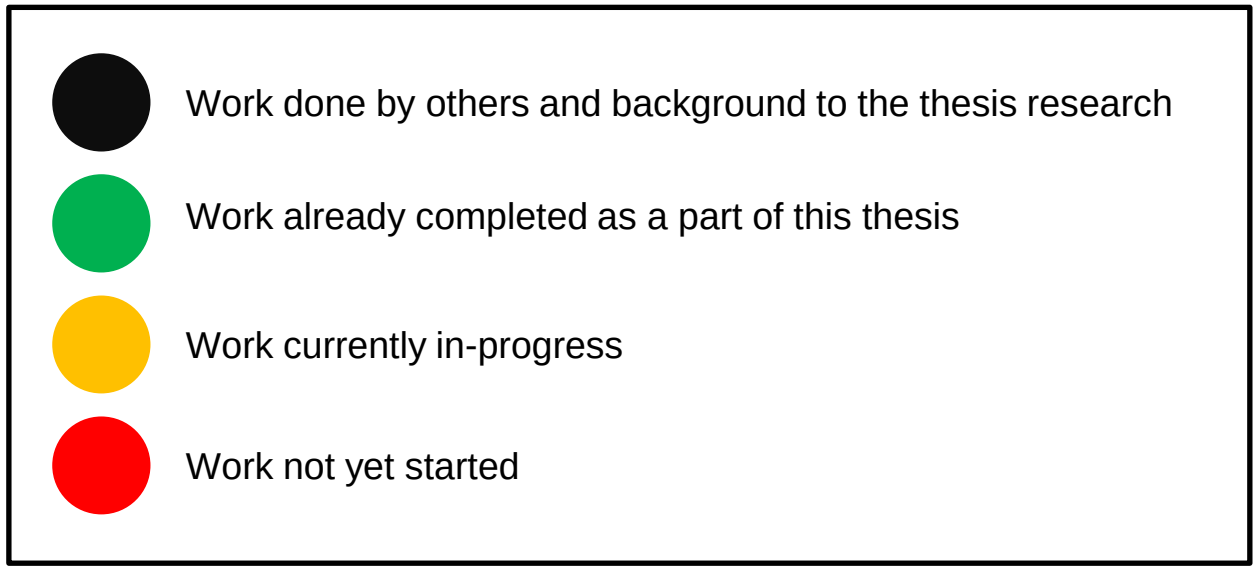
Kathleen M., Chair

TBD

Carnegie Mellon University



Thesis Work Completion Key



Disclaimers:

The views expressed are those of the author and do not reflect the official policy or position of the US Army, Department of Defense or the US Government.

The appearance of U.S. Department of Defense (DoD) visual information does not imply or constitute DoD endorsement.

Social-Cyber Security

- BEND provides a framework for describing information space maneuvers
- BEND allows us to frame:
  - (Source) Who
  - (Payload) Maneuver
  - (Target) On Whom
  - (Effect) Impact

Narrative Maneuvers: Impact what is being said and how it is being said			**Community Maneuvers**: Alter who is connected to whom, the strength of those connections, and so alters who is influential and what groups exist		
Emotional Messaging	**Develop Narrative**	**Counter Narrative**	**Individual Centric**	**Make Groups**	**Unmake Groups**
Excite	Explain	Distort	Back	Build	Neutralize
Dismay	Engage	Dismiss	Negate	Bridge	Narrow
	Enhance	Distract		Boost	Neglect

Major questions and motivation

- **Q1: How does the BEND framework fit into current military doctrine and how can it enhance current information domain analysis?**
- **Q2: How can we detect the presence of BEND maneuvers through their effects? Can we match these maneuvers to narrative campaigns?**
- **Q3: How can we develop exercise training scenarios for the BEND framework?**
  - **Can we extract a training scenario from real data without resorting to hand-crafting messages?**
  - **How can we leverage AI/LLMs to enhance training scenarios and generate multi-modal BEND?**

Purpose

The purpose of this thesis is to:

- Move BEND beyond a theoretical discussion framework and into an operationally relevant construct for evaluating social-cybersecurity
- Nest BEND within current US military doctrine
- Identify countermeasures to BEND maneuvers,
- Connect detected maneuver effects with broader BEND campaigns
- Leverage AI to develop synthetic training scenarios that closely mirror real word data with minimal human intervention

Doctrinal BEND

Prior Work

- Blaine (CMU-S3D-23-102) looked at and compared BEND to four other information operations frameworks:
  - Ben Nimmo: 4Ds
  - ABCDE Framework
    - Camille Francois: ABC Framework
    - Alexandre Alaphilippe: ABCD Framework
    - Pamment: ABCDE Framework
  - Blazek: SCOTCH Framework
  - DISARM Foundation: DISARM Framework

Table 1.1: Comparison of informations operations frameworks

Characteristics	4 D's	ABC(D)(E)	SCOTCH	DISARM	BEND
General high-level approach	x	x	x	x	x
Specific systematic methodology					x
Key Actor Analysis		x	x		x
Behavior Analysis	x	x		x	x
Quantitative Analysis					x
Limited to Disinformation Analysis	x	x		x	
Influence campaign analysis/assessment			x		x
Develops recommendations		x		x	x
References	[98]	[3, 57, 101]	[22]	[50]	[17, 38]

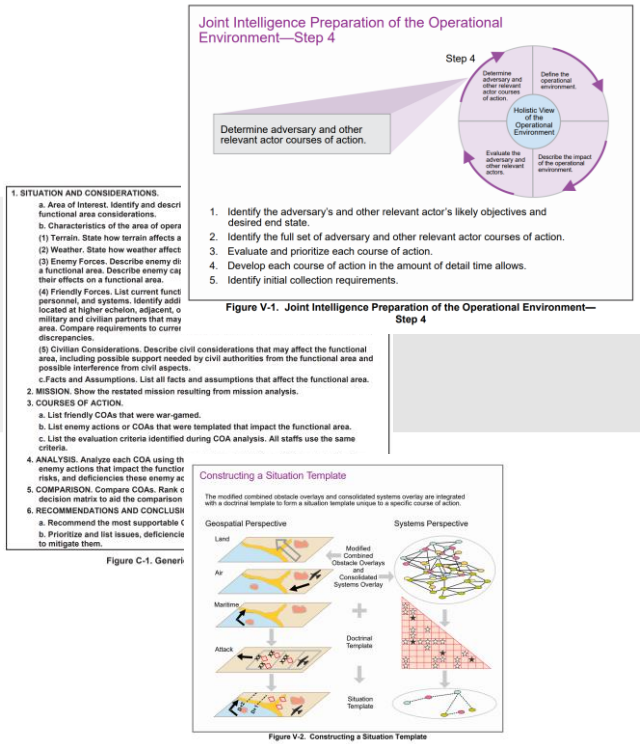
How does the BEND framework fit into current military doctrine?

Current References

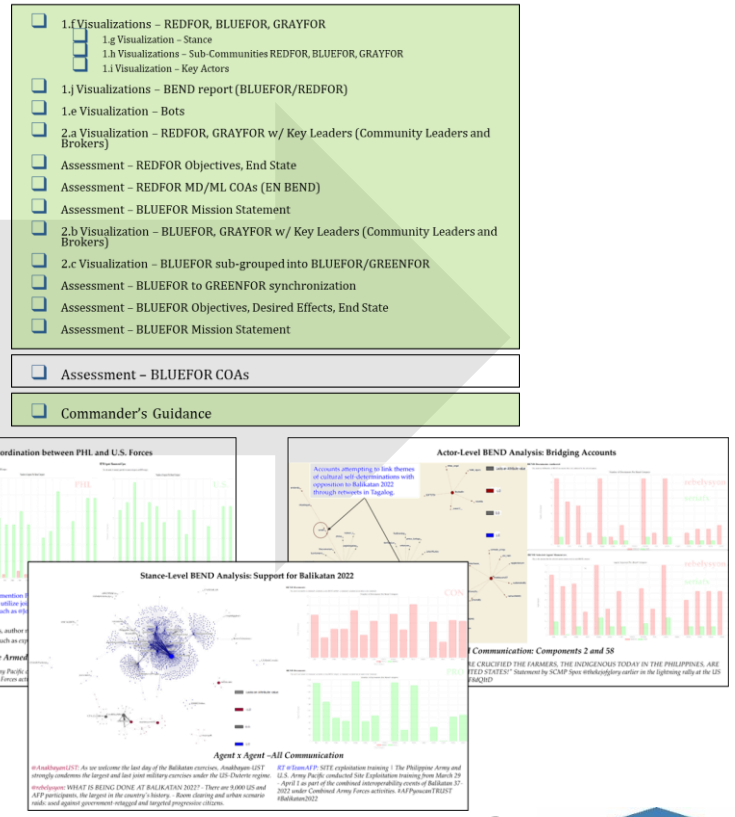
- JP 3-04 Information in Joint Operations
- *JP 3-13 Information Operations*
- NWP 3-13 Navy Information Operations
- FM 3-13 Information Operations
- AFDP 3-13 Information in Air Operations
- CJCSI 3110.01C Joint Information Operations Proponent
- DODI 3600.01 Information Operations
- ADP 5-0 The Operations Process
- MCWP 3040.4 Marine Air-Ground Task Force Information Operations
- JP 2-01.3 Joint Intelligence Preparation of the Operational Environment
- ATP 2-01.3 Intelligence Preparation of the Battlefield
- JP 3-60 Joint Targeting

⋮

Current Products

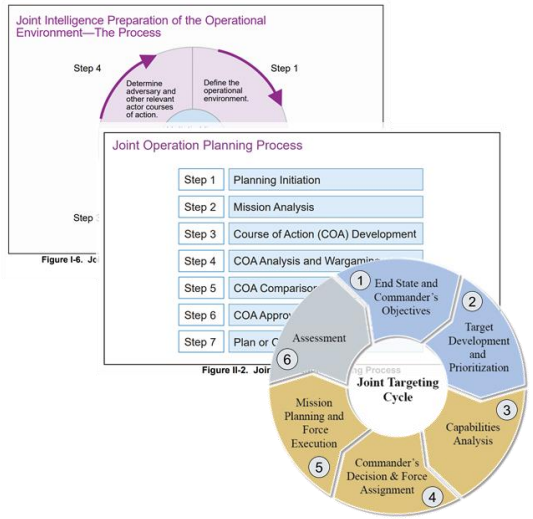


New References and Products



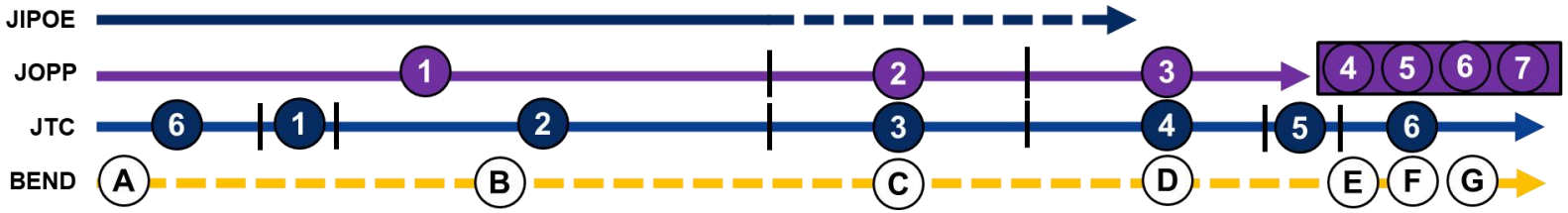
Carnegie Mellon University

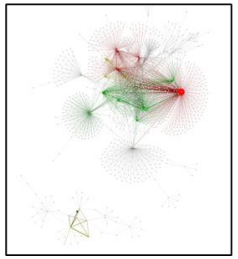
How do we use BEND with current doctrine?

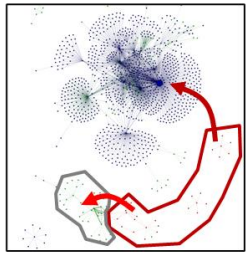


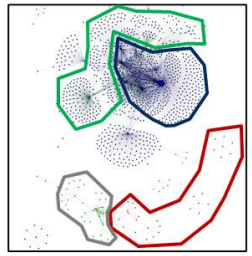
A) SPOTREP of adversarial action on social media
B) J2/OSINT updates EN SITEMP **(JIPOE, JOPP 1, JTC 2)**
C) PAO evaluates CDR's objectives, desired effects, and endstate **(JOPP 2, JTC 1)**
D) JFECC develops COAs for CDR **(JOPP 3, JTC 4/5)**
E) CDR approves COA **(JOPP 6, JTC 5)**
F) COA Execution by PAO **(JTC 6)**
G) Impact Assessment by J2/OSINT **(JIPOE, JOPP1, JTC 0/1)**

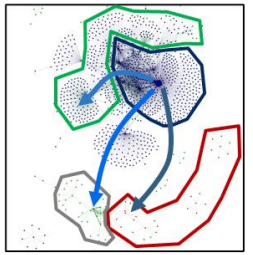
JIPOE – Joint Intelligence Preparation of the Operational Environment (JIPOE)
JOPP – Joint Operation Planning Process (JOPP)
J-OPTiK – Joint Operations in the Information Environment Playbook Toolkit QRT
JTC – Joint Targeting Cycle

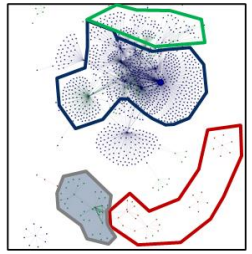












MDCOA: EN conducts **BRIDGE** between anti-US echo-chambers and indigenous and environmental rights activists IOT connect both groups' goals

MLCOA: EN conducts **DISTRACT** using supposed US COVID response failures IOT dilute US solidarity message against adversary expansion in the region.

COA1: US conducts **EXCITE** by highlighting successful US and allied anti-piracy efforts in the region IOT engender joy and contentment in regional populace

COA2: US conducts **BRIDGE** between US women's rights initiatives in the region and indigenous and environmental rights activists IOT connect US goals with activist goals

COA3: US conducts **DISTRACT** by highlighting adversary environmental affects IOT to overshadow adversary claims of the same

BEND Framework

Narrative Maneuvers: Information and content of messages (What/How topics are discussed)			**Community Maneuvers:** Alter the connections within the social network (i.e., online communities or threads)		
Influence Emotion	**Develop Narrative**	**Counter Narrative**	**Affect Leaders**	**Make Groups**	**Unmake Groups**
Excite	Engage	Distract	Back	Build	Neglect
Dismay	Explain	Dismiss	Negate	Boost	Narrow
	Enhance	Distort		Bridge	Null

Carnegie Mellon University

Doctrinal BEND Changes to be made

- A synthesis of current doctrine and the BEND framework enables a social media component within the Information Operations Cell to have **doctrinally conformant input into the planning process.**
- The BEND framework enables a **coherent social media Running Estimate** as an input to the broader Mission Analysis conducted by a staff.
- The BEND framework allows for a **consistent lexicon** across influence, deception, and inform capabilities as well as between information operations, intelligence, public affairs, and others.
- This thesis does not investigate or propose a specific set of tactics, techniques, and procedures (TTPs) for the Information Operations Cell, nor does it address titling authorities.
- **The focus is on producing doctrinally conformant, coherent social media staff inputs that use lexicon consistent across capabilities and functions.**
- **The output is a set of BEND products that mirror current doctrine and suggestions for a more comprehensive incorporation if BEND into doctrine.**

BEND Framework Improvements

Prior Work

- ORA and Netmapper combine to provide a BEND report that automatically detects BEND maneuvers using CUEs and some network metrics
- Blane (CMU-S3D-23-102) laid out a more comprehensive framework for analysis and suggested refinements that explored a more complex method for weighting CUEs

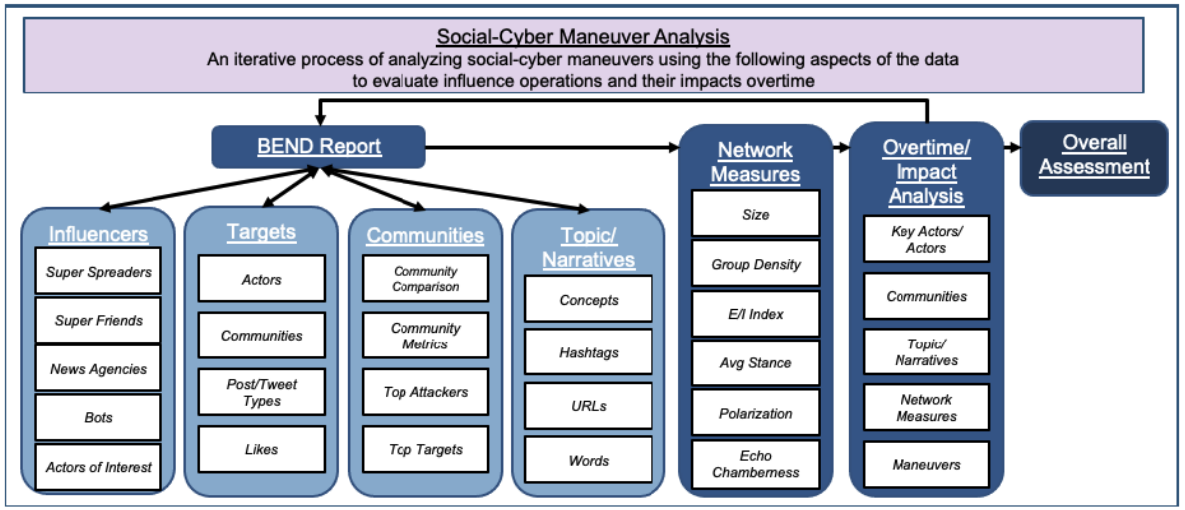


Figure 4.2: BEND Analysis Workflow

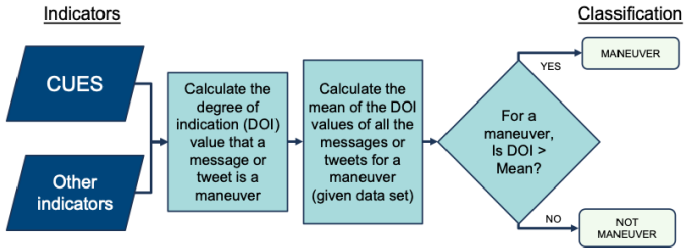
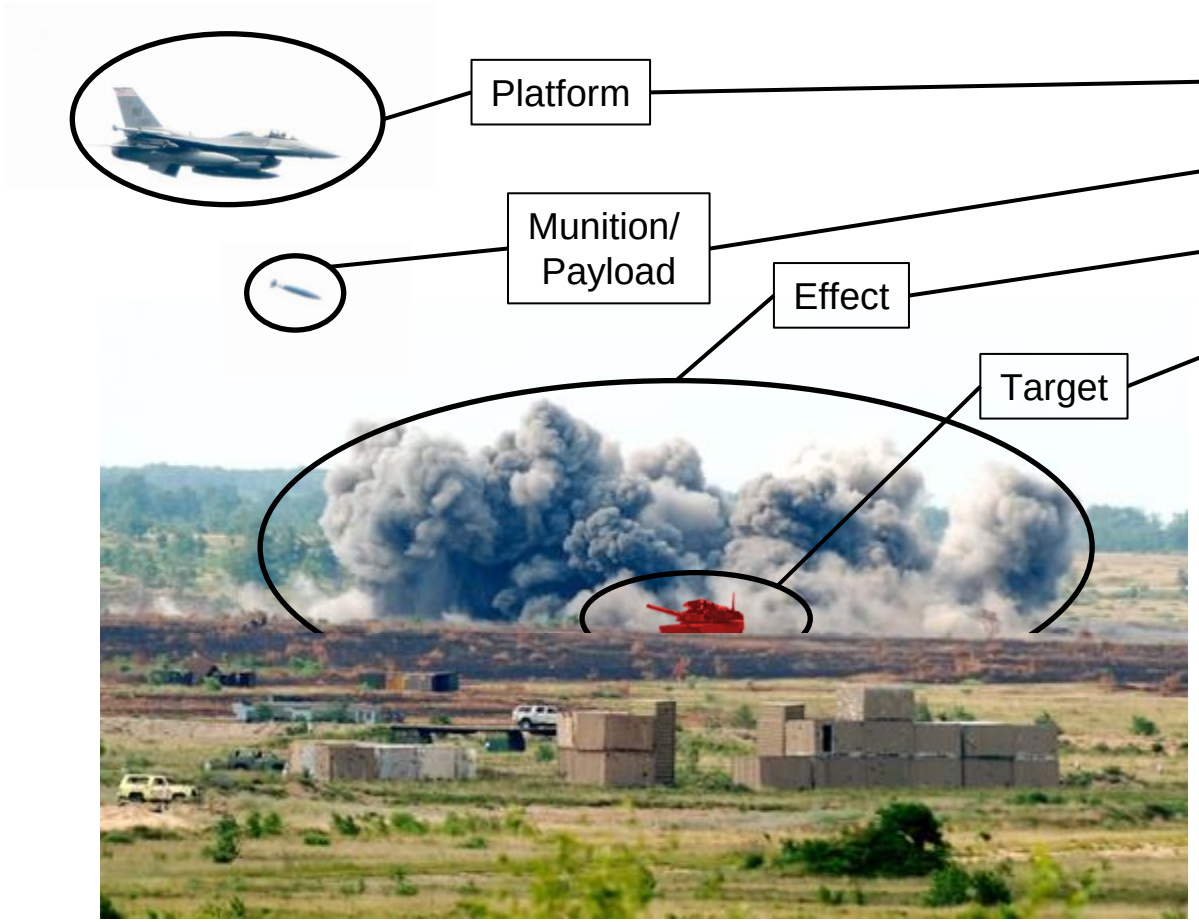


Figure 3.6: Current method for detecting BEND maneuvers. Indicators are used as inputs for calculating degrees of indication. A message is classified as a maneuver if the DOI of the message is greater than the mean of the DOIs for a maneuver for all the messages within the given data set.

Effects-based Approach



Source: RedditUser09

Message: People who like dogs are the worst.

Effect: DISMAY (Possibly Multiple)

Target: People who like dogs (Possibly Multiple)

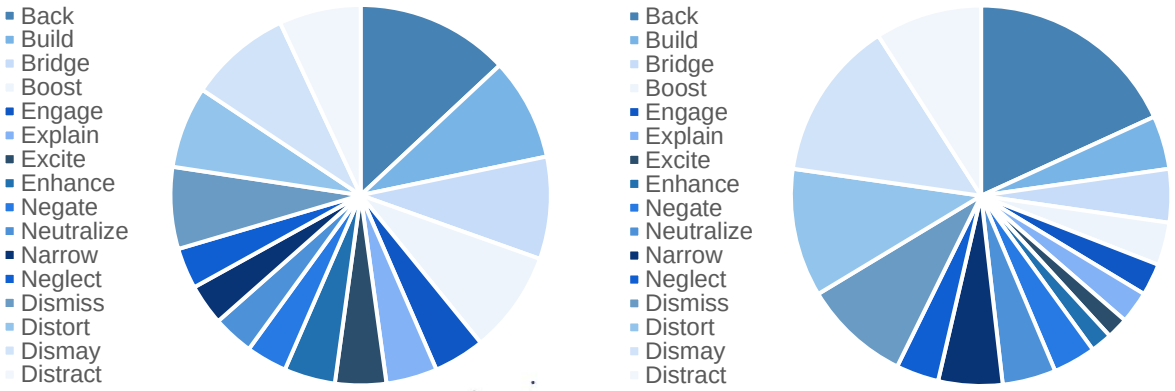
Prior work takes the Source and Message and attempts to extrapolate an intended Effect to determine BEND maneuvers.

This proposal reverses the process – instead, by identifying Effects experienced by a target to determine the BEND maneuver used. Neither a specific Message or Source is identified.

Requires three additional measures – message level, impact, and target identification.

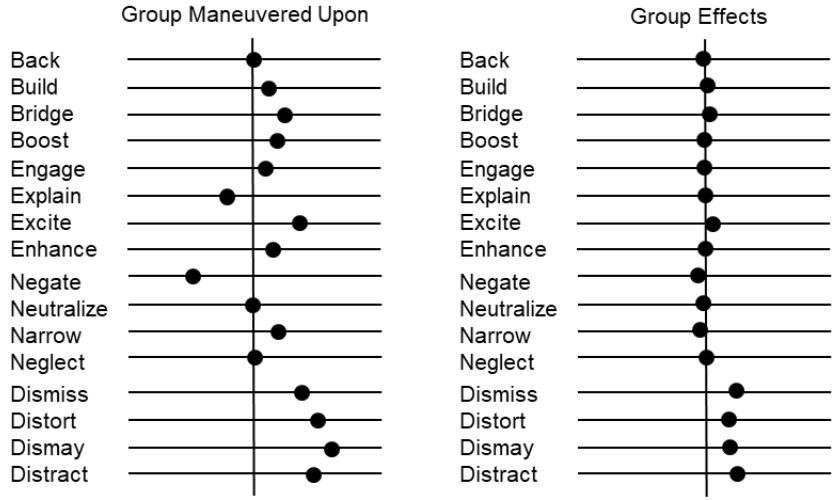
Effects-based Approach

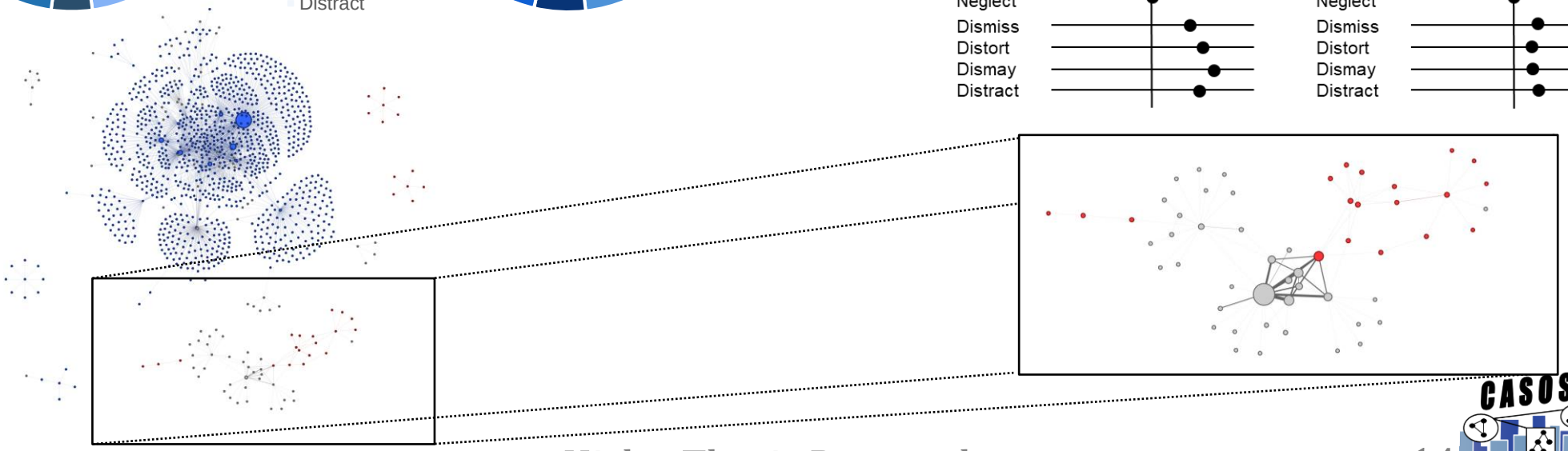
Global Maneuvers Executed (CUE+)



Global Maneuver Observed (Effects)

Group Target





Carnegie Mellon University

Effects-based Approach (B)

Name	Definition	Detect
Back	Discussion or actions that increase the actual, or the appearance of, an actor's importance or effectiveness relative to a community or topic	**Centrality in interaction network, importance to group/ changes positively over the time more than the baseline corpus**
Build	Discussion or actions that create a group, or the appearance of a group, where there was none before	**New group – agent interactions / changes positively over the time more than the baseline corpus**
Bridge	Discussion or actions that build a connection between two or more groups or create the appearance of such a connection	**Centrality, betweenness of the edge nodes of two groups / changes positively over the time more than the baseline corpus**
Boost	Discussion or actions that increase the size of a group and/or the connections among group members, or the appearance of such	**Size of group, graph density / changes positively over the time more than the baseline corpus**

Effects-based Approach (E)

Name	Definition	Detect
Excite	Discussion or actions related to a community or topic that cause the reader to experience a positive emotion such as joy, happiness, liking, or excitement	**Target packet emotional valence will be higher in happiness and surprise / changes positively over the time more than the baseline corpus**
Explain	Discussion or actions that clarify a topic to the targeted community or actor often by providing details on, or elaborations on, the topic	**Topic specialization – additional jargon and net shift towards same stance / changes over the time more than the baseline corpus**
Engage	Discussion or actions that increase the relevance of the topic to the reader often by providing anecdotes or enabling direct participation and so suggesting that the reader can impact the topic or will be impacted by it	**Topics proportional representation / changes positively over the time more than the baseline corpus**
Enhance	Discussion or actions that provide material that expands the scope of the topic for the targeted community or actor often by making the topic the master topic to which other topics are linked	**Increased linkage and centrality, betweenness / changes positively over the time more than the baseline corpus**

Effects-based Approach (N)

Name	Definition	Detect
Negate	Discussion or actions that decrease the actual, or the appearance of, an actor's importance or effectiveness relative to a community or topic	**Centrality of node / changes negatively over the time more than the baseline corpus**
Neutralize	Discussion or actions that cause a group to be, or appear to be, no longer of relevance, e.g., because it was dismantled	**Group nodes have more in common with other groups than themselves (group disappears)**
Narrow	Discussion or actions that lead a group to be, or appear to be, more specialized, and possibly to fission, or appear to fission, into two or more distinct groups	**Multiple groups where only one was present before, fewer links on bipartite network from meta-agent group node to topic/stance nodes**
Neglect	Discussion or actions that decrease the size of a group and/or the connections among group members, or the appearance of such	**Density and/or size / changes negatively over the time above the baseline corpus**

Effects-based Approach (D)

Name	Definition	Detect
Dismay	Discussion or actions related to a community or topic that cause the reader to experience a negative emotion such as worry, sadness, disliking, anger, despair, or fear	**Target packet emotional valence will be higher in anger, sadness, fear / changes over the time more than the baseline corpus**
Distort	Discussion or actions that obscure a topic to the targeted community or actor often by supporting a particular point of view or calling details into question	**Topic specialization – additional jargon and net shift towards opposite stance / changes over the time more than the baseline corpus**
Dismiss	Discussion or actions that decrease the relevance of the topic to the reader often by providing stories or information that suggest that the reader cannot impact a topic or be impacted by it	**Topics proportional representation / changes negatively over the time more than the baseline corpus**
Distract	Discussion or actions that redirect the targeted community or actor to a different topic often by bring up unrelated topics, and making the original topic just one of many	**Decreased linkage and centrality, betweenness / changes over the time more than the baseline corpus**

Study 1: Real World Effects

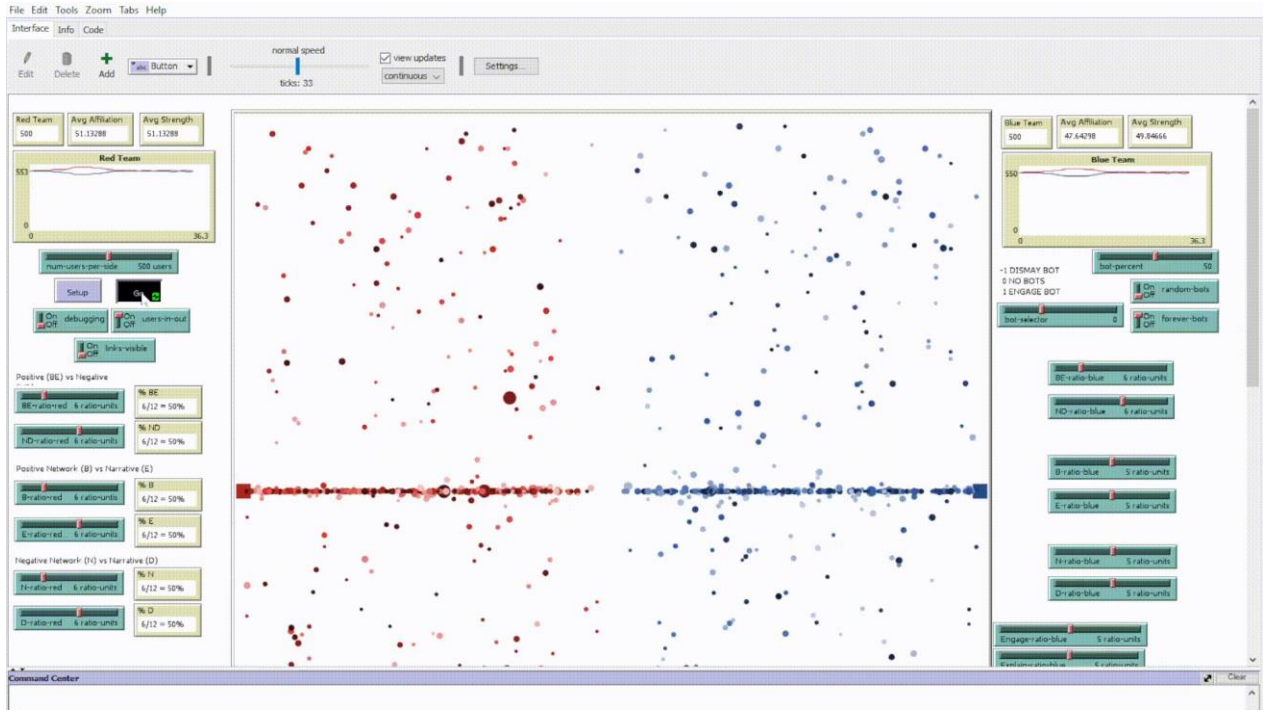
Corpus Topic	Twitter/X	Telegram	Reddit
Nice, France Terrorist Attack 2020			
COVID-19/Vaccines			
US Elections 2020			
Ukraine-Russia Conflict			

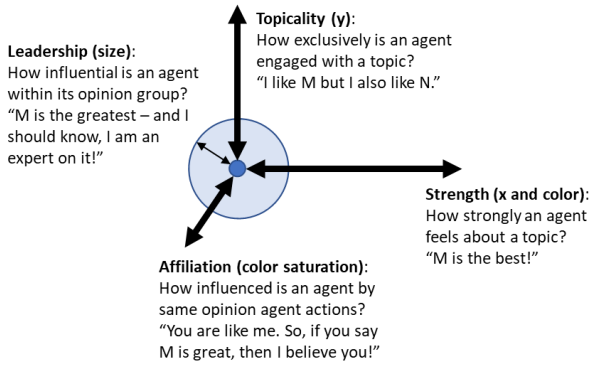
- Using existing datasets eliminates external dependencies
- CUE+ BEND detection through ORA will be compared against effects-based BEND detection
- Correlations between attempted BEND maneuvers (CUE+) and observed BEND maneuvers (effects-based) allow for some measure of effectiveness and for the assessment of countermeasures
- Results from BEND Battle can then be compared to ratios of CUE+ detected attempted maneuvers per effects-based detected maneuvers to validate simulated countermeasure effectiveness

Study 2: Simulations Based on Determined Effects

- A lack of effects-based detection results in an inability to understand BEND interactions and develop countermeasures from ORA/Netmapper alone
- Now, using effects-based detection, it is possible to create theoretical measurements of effectiveness of BEND using agent-based simulations
- The results of the simulations allow us to determine the effectiveness of individual BEND maneuvers as counters
- This simulation – titled "BEND Battle" - uses NETLOGO to run an agent-based simulation on a single topic
- **Results will be compared to Study 1 for validation**

BEND Battle Simulation



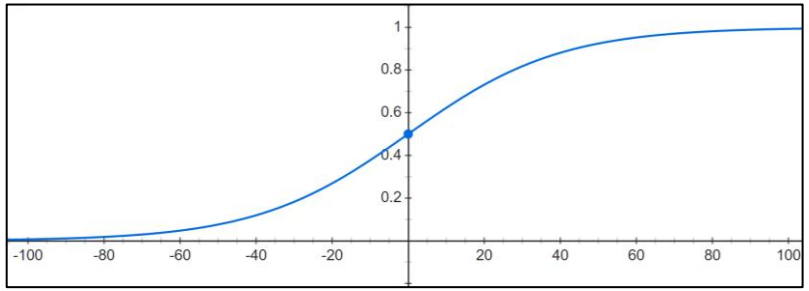


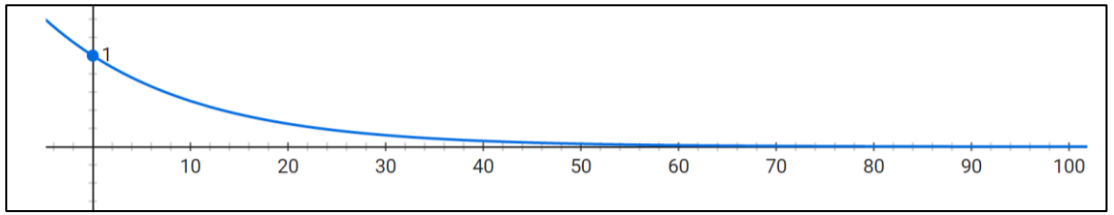
$$S \text{ (strength)} = [-100, 100]$$
$$T \text{ (topicality)} = [-100, 100]$$
$$A \text{ (affiliation)} = [0, 100]$$
$$L \text{ (leadership)} = [0, 100]$$

$$S' = S + I\left(\frac{1}{1 + e^{-.05A}}\right)\left(e^{-.069S}\right)$$

Affiliation

Strength

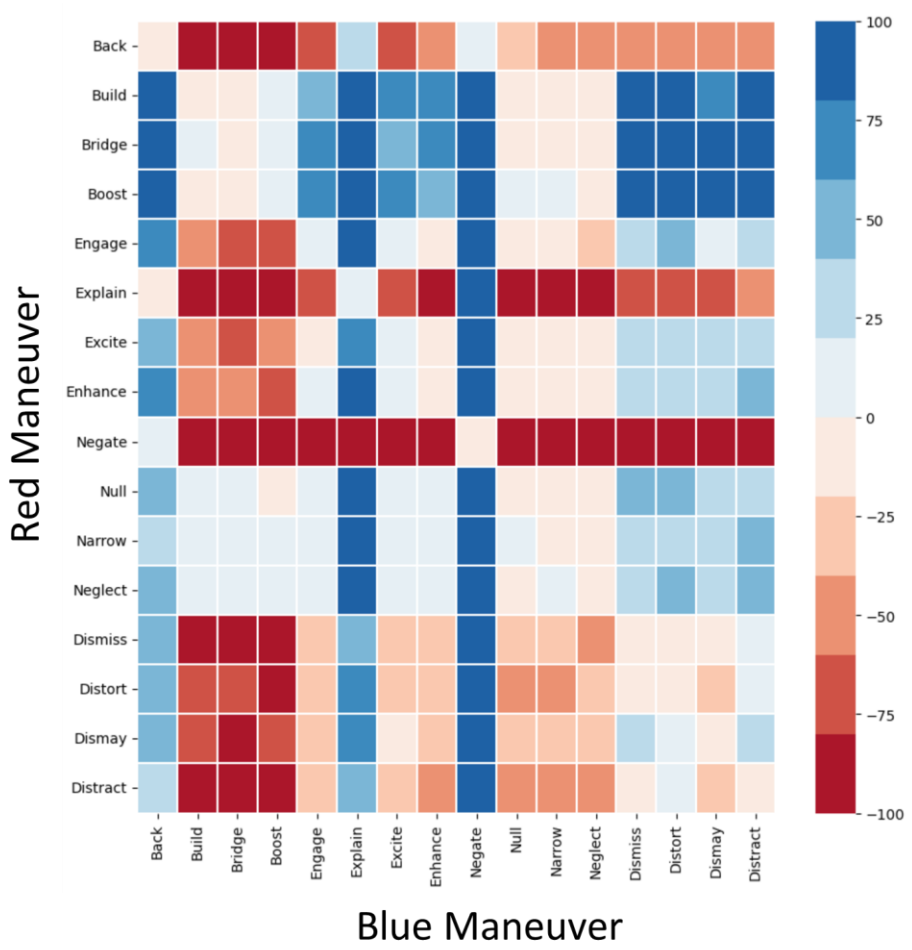




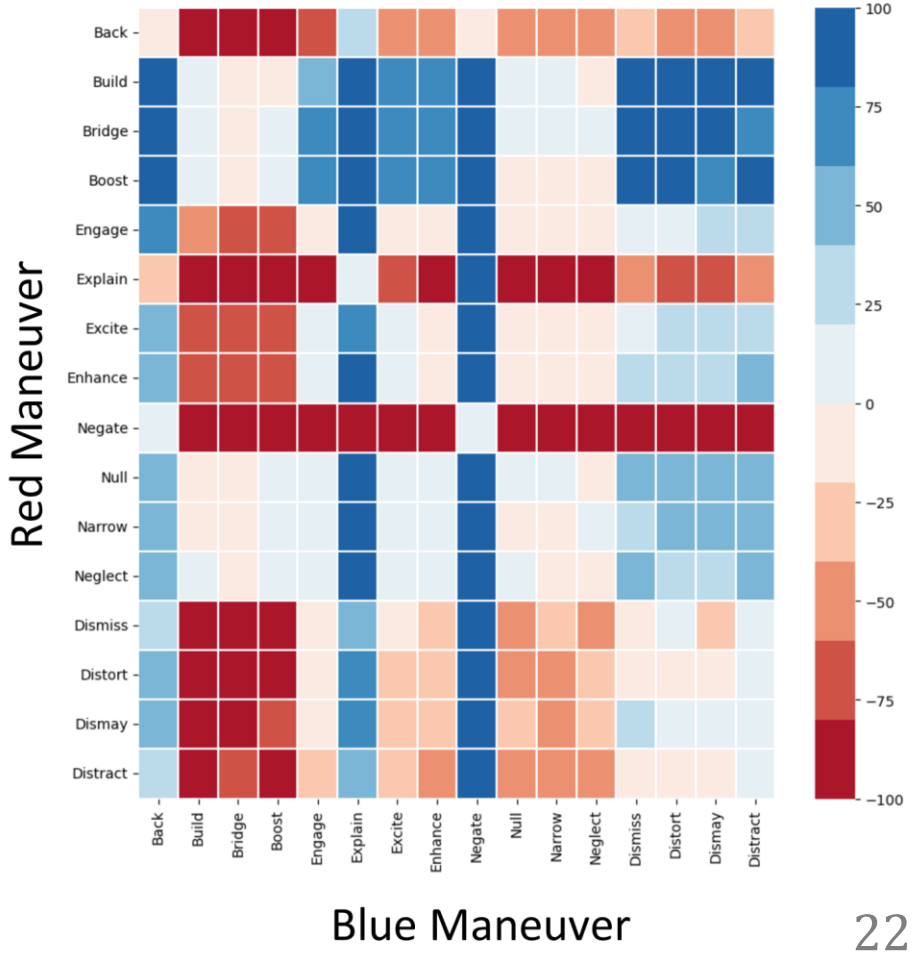
Carnegie Mellon University

Initial Results

No Reposts with Equal Probability



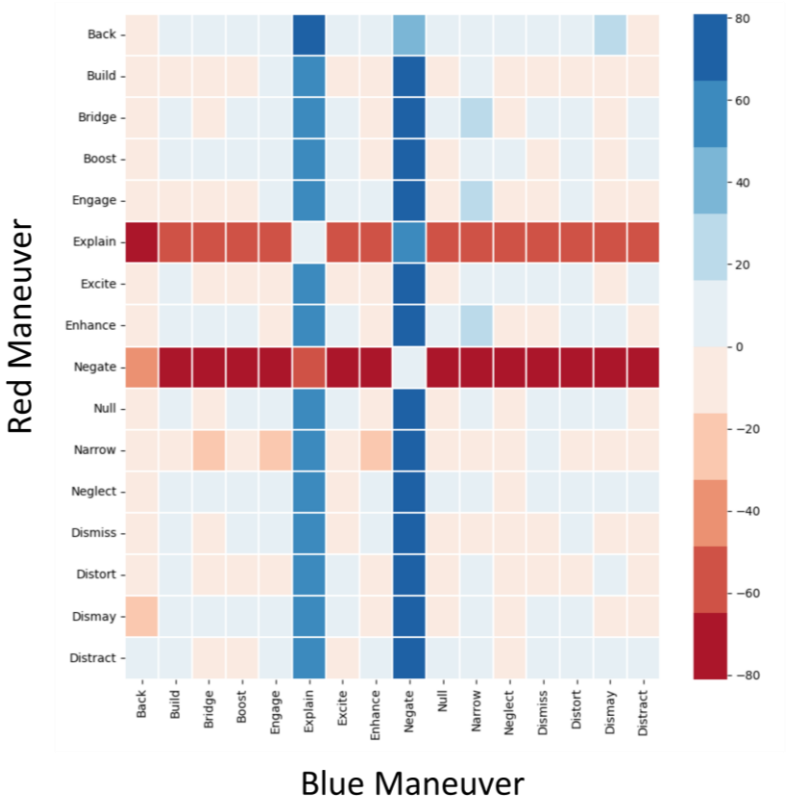
50% Reposts with Equal Probability



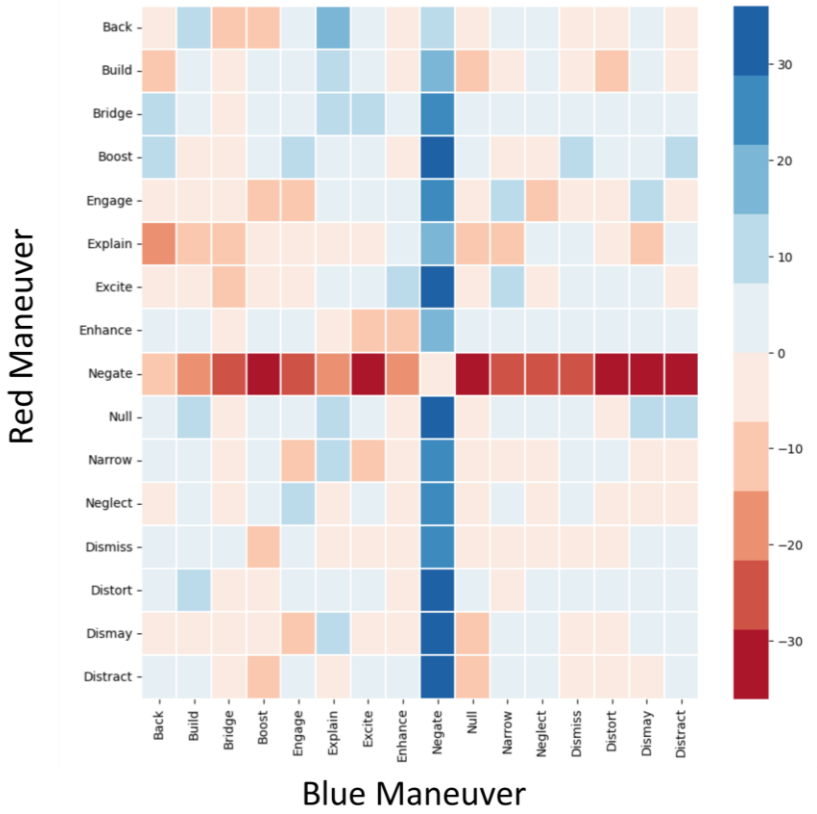
Carnegie Mellon University

Initial Results

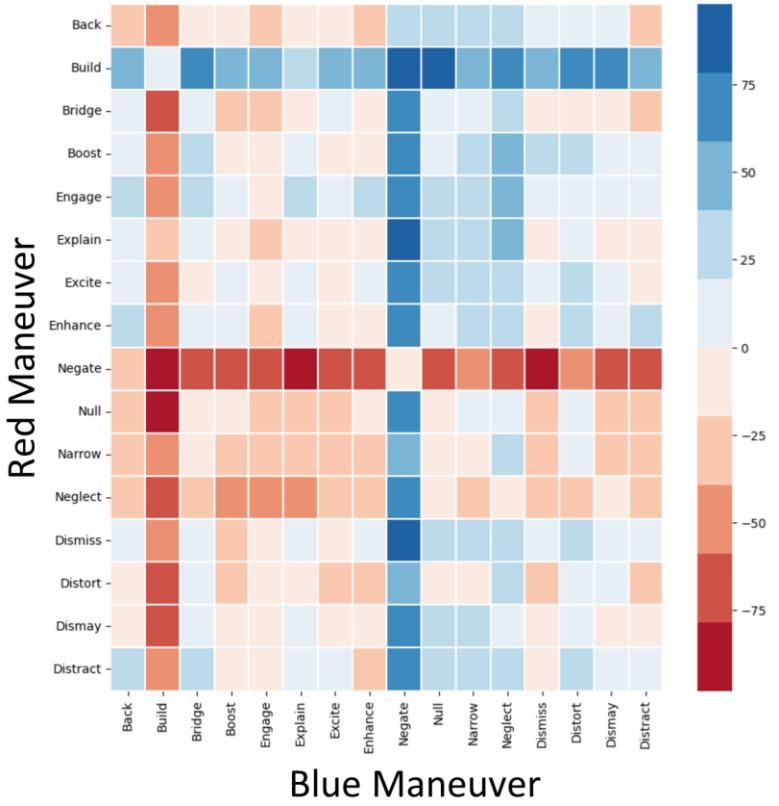
50% Reposts with Real-World Probability



50% Reposts with RW Prob but just Doubled



50% reposts, multi-maneuvers, RW Prob, Doubled



Carnegie Mellon University

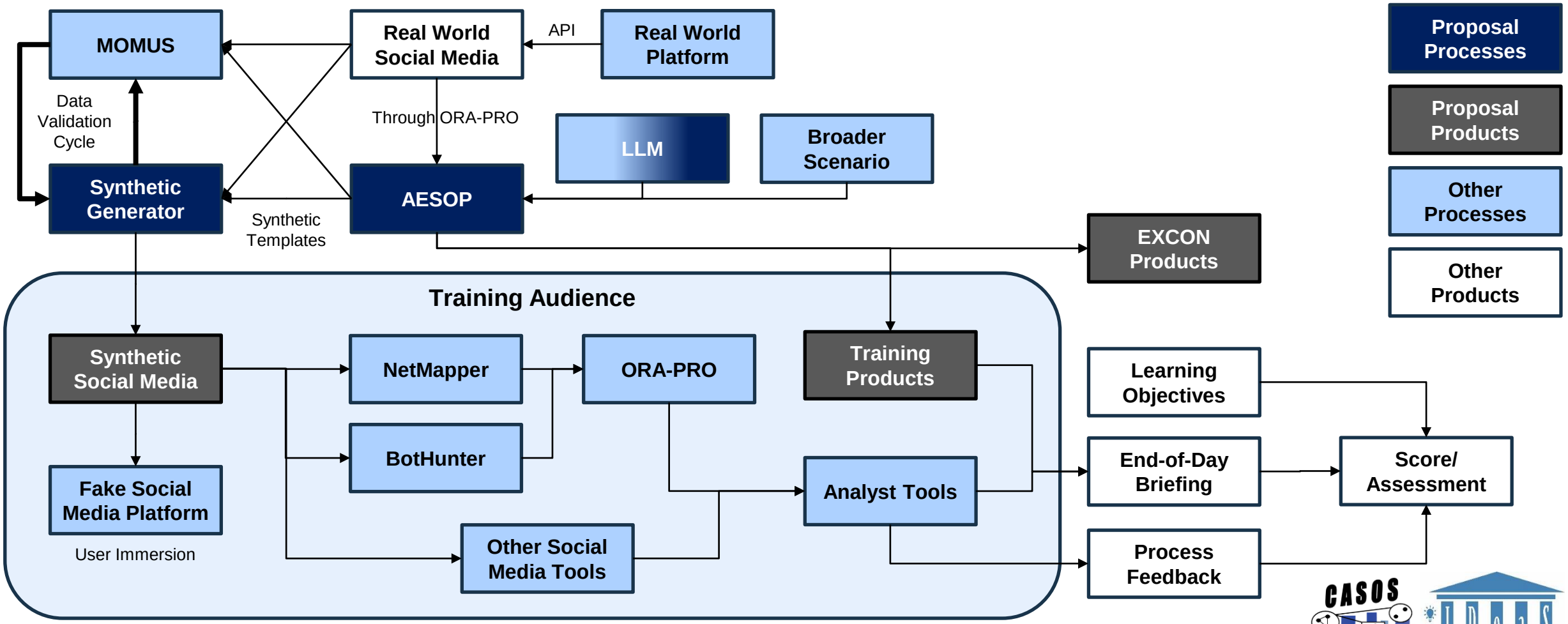
AI-Enabled BEND Scenario Development

Scenario Training

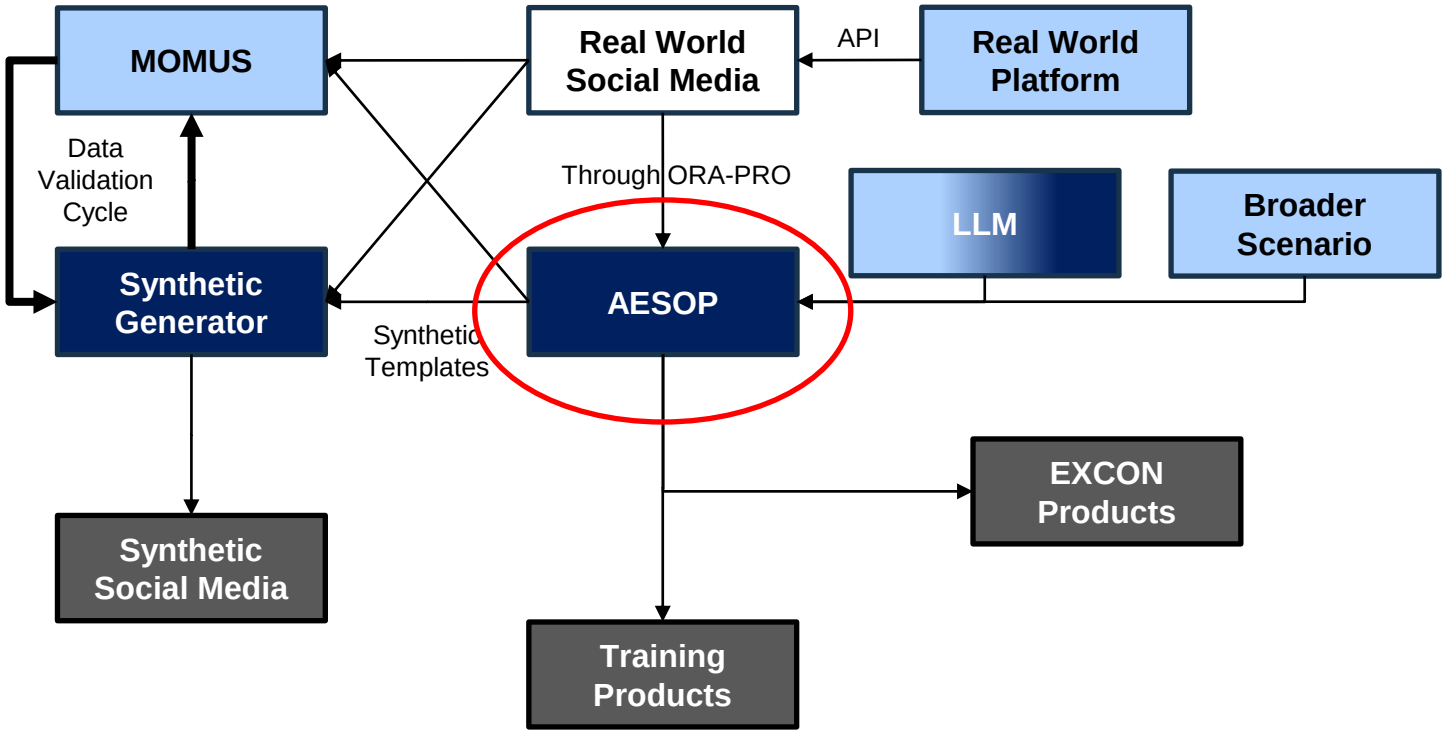
- Understanding the BEND framework within existing doctrine, identifying BEND and its effects, and even conceptually knowing countermeasures falls short of fully operationalizing BEND
- Effective BEND operationalization requires realistic training on a realistic corpus

	Re-configurable	Scalable	Realistic Network	Realistic Narrative
Real Data				
Hybrid: Hand alteration				
Hybrid: Automated alteration				
Current Synthetic				
Synthetic out of Real Data				

Realistic Training



AI-Enabled Scenario Orchestration and Planning (AESOP)

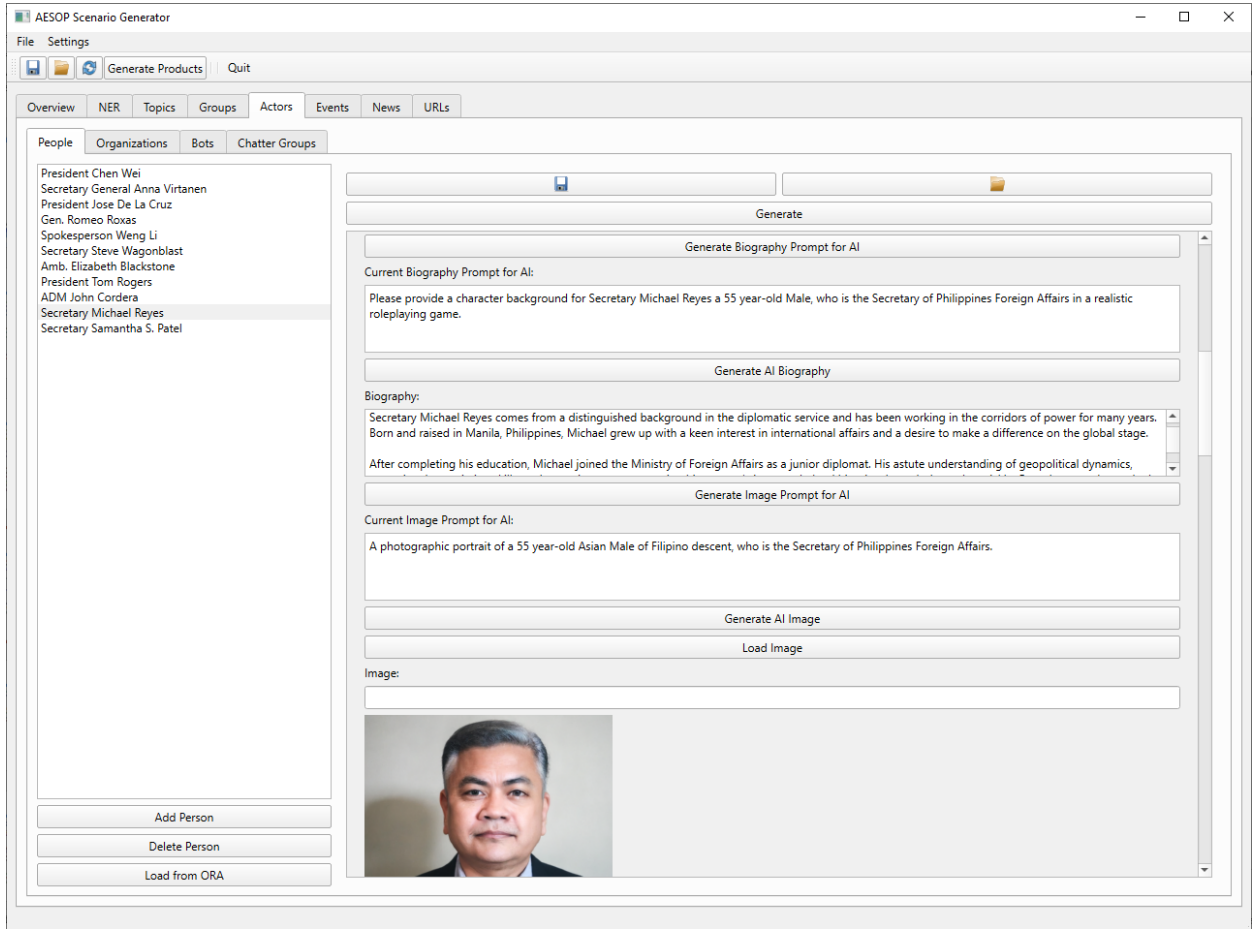


AESOP allows Information Environment planners to develop social-cyber exercise scenarios from scratch or develop social-cyber vignettes for integration with existing scenarios.

It leverages large language model (LLM) artificial intelligence (AI) to reduce planner load and increase realism and immersion for the training audience.

Planners complete basic fields – such as date ranges and summaries – and a configurable LLM is used to generate surrounding details.

AI-Enabled Scenario Orchestration and Planning (AESOP)



The Scenario Generator provides scaffolding for developing a range of templates to enable synthetic data generation: Actors, Topics, Groups, Events, News, URLs, etc.

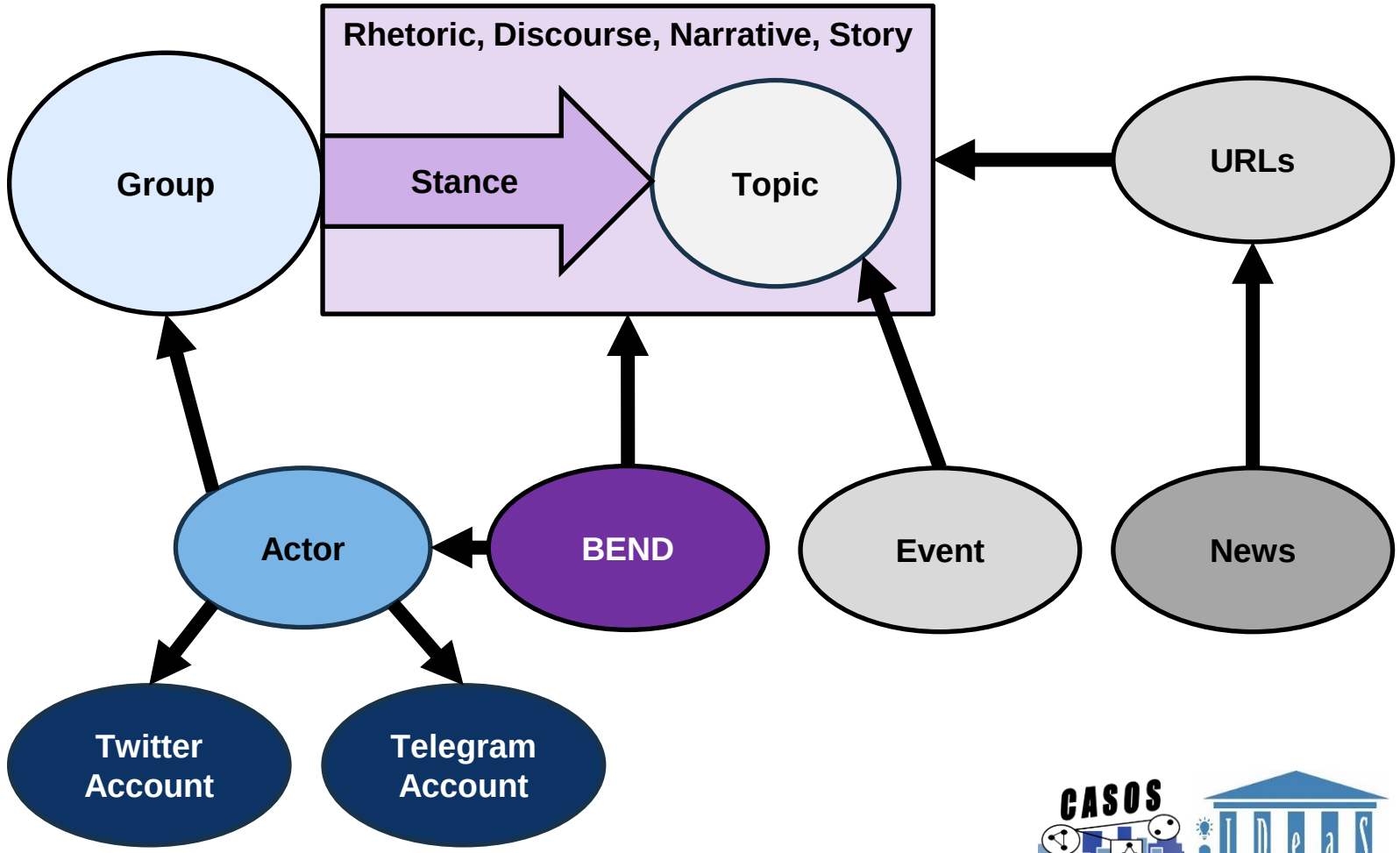
As planners complete basic data fields, the Scenario Generator develops an engineered prompt for the LLM.

Planners can make additional changes to the prompt as required.

Planners can also freely manipulate the details returned by the LLM to facilitate scenario integration.

AI-Enabled Scenario Orchestration and Planning (AESOP)

Feature	Archive File	Synthetic Template	EXCON	Participants
Agents				
People	JSON	JSON	DOCX	DOCX
Organizations	JSON	JSON	DOCX	DOCX
Bots	JSON	JSON	DOCX	DOCX
Telegram				
Account	JSON	JSON	JSONL	JSONL
Channel	JSON	JSON	JSONL	JSONL
Messages	JSON	JSON	JSONL	JSONL
Twitter/X				
Account	JSON	JSON	JSONL	JSONL
Messages	JSON	JSON	JSONL	JSONL
Facebook				
Account	JSON	JSON	JSONL	JSONL
Page	JSON	JSON	JSONL	JSONL
Messages	JSON	JSON	JSONL	JSONL
Groups	JSON	JSON	DOCX	
Topics	JSON	JSON	DOCX	
Events				
Event Summary	JSON	JSON	DOCX	DOCX
Fragmentary Orders	JSON		DOCX	DOCX
Press Releases	JSON		DOCX	DOCX
Intelligence Reports	JSON		DOCX	DOCX
News				
News Agency	JSON		HTML	HTML
Real News Articles	JSON		HTML	HTML
Disinformation Articles	JSON		HTML	HTML
Pink Slime Articles	JSON		HTML	HTML
URL Listings	JSON	JSON		
Scenario Overview				
MSEL			XLSX	
MOPs			XLSX	
TTP Evaluation Guidance			DOCX	
Executive Summary				
Exercise Roles				
OMEN Research Goals				
Mission	JSON		DOCX	DOCX
Commander's Guidance	JSON		DOCX	DOCX
Scenario Overview	JSON		DOCX	DOCX
Scenario Description	JSON		DOCX	DOCX



AESOP Outputs

Scenario Description

Balikatan 2045

General Info

Date Range: 2045-04-01 to 2045-05-01

Countries of Interest:
Philippines, United States

Regions of Interest:
South-eastern Asia

Other Locations of Interest:

Scenario Description

Balikatan 2045 was an exercise run by the Philippines and United States that took place from April 1 to May 1 in 2045. Aimed at developing and preserving the security relationship between the two countries, participants were trained in crisis action planning, counter-terrorism operations and increasing the interoperability and coordination of their forces.

However, the exercise was overshadowed by a severe health crisis in the region, most notably the outbreak of the Great Pox. This highly infectious disease was first discovered in 2045 and its rapid spread to countries such as the Philippines, Australia, China, Japan, Thailand, and Malaysia has had a huge impact on the medical community. Symptoms of the virus include fever, chills, nausea, diarrhea, muscle aches and more, and with no vaccine currently available, preventive measures are the best way to contain the spread.

Tragedy was also faced during Balikatan 2045, as the USS Carlisle collided with the Liberian-flagged tanker Casonee MC in the Strait of Malacca. The US Navy warship was conducting routine operations when the two ships came into contact, causing flooding in various compartments of the destroyer. Ten U.S. Navy sailors were killed in the incident, and rescue efforts were launched by various agencies, including the Singapore Coast Guard, Royal Malaysian Navy, and the U.S. Navy. Unfortunately, no further survivors were located and the cause of the collision is still under investigation.

Finally, Balikatan 2045 was marked by Typhoon Hayman. This Climate Event resulted in extensive damage to vital infrastructure in the Philippines, leaving thousands without food, water, or medical care. In response, the Red Cross activated their Cluster System, consisting of a collection of different humanitarian organizations. The U.S. Navy, along with other governments and NGOs, began sending relief to the hardest hit areas in the form of food, medical supplies and personnel. Volunteers were organized to distribute blankets and

Actor Information Cards

Chandu Claver

General Info

Name: Chandu Claver
Leader Type: Political
Title: Leader
Organization: Cordillera's People Alliance
Gender: Male
Age: 56
Race: Asian
Nationality: Filipino

Biography

Chandu Claver is a 56 year-old man from Cordillera, a rural region that has been generally overlooked by the rest of the country. Having grown up in this hamlet among its close-knit community, Chandu has grown to be considered a leader among the people of Cordillera, embodying their values and fighting for their rights.

Since a young age, Chandu had been advocating for the view point of the people living in his disadvantaged region. He was at the forefront of the struggle in obtaining basic services like education and healthcare. Over the years, Chandu has built a strong network of organizations that cooperate to fight for the rights of the impoverished Cordillera people. He eventually gained the title of the leader of Cordillera's People Alliance.

Dedicated to his cause, Chandu puts a lot of energy into ensuring that the voices of the people of Cordillera are heard, and their needs are met. He has made several appearances at regional and national level political events to voice the issues faced by his people, and has organized several protest marches to support his cause.

Chandu is a loving husband and father, and is described as a determined yet gentle person who always puts the needs of his people first. He is a firm believer in nonviolent resistance and community organizing, and often works with others to come up with creative solutions to the pressures his people face. Despite his age, Chandu remains tireless in his work, and is seen throughout Cordillera as an inspirational leader.

Synthetic Data Templates Per Actor Per Platform


```
{
    "Name": "Chandu Claver",
    "Type": "Political",
    "Title": "Leader",
    "Leads": "Cordillera's People Alliance",
    "Age": "56",
    "Gender": "Male",
    "Race": "Asian",
    "Nationality": "Filipino",
    "Real person": false,
    "Maneuvering upon": "",
    "Bio Prompt": "Please provide a character background for Chandu Claver a 56 year-old Male, who is the Leader of Cordillera's People Alli
    "AI Bio": "Chandu Claver is a 56 year-old man from Cordillera, a rural region that has been generally overlooked by the rest of the cou
    and fighting for their rights.\n\nSince a young age, Chandu had been advocating for the view point of the people living in his disadvan
    organizations that cooperate to fight for the rights of the impoverished Cordillera people. He eventually gained the title of the leade
    their needs are met. He has made several appearances at regional and national level political events to voice the issues faced by his p
    who always puts the needs of his people first. He is a firm believer in nonviolent resistance and community organizing, and often works
    Cordillera as an inspirational leader.",
    "Image Prompt": "A photographic portrait of a 56 year-old Asian Male of Filipino descent, who is the Leader of Cordillera's People Alli
    "AI Image": "img-6XmPjiCDjngDoVAnldfMzx.png",
    "Description/Purpose": "",
    "User Active Start Date": "2023-07-02",
    "User Active End Date": "2023-07-02",
    "Features": [
        false,
        true
    ],
    "Tweet Distribution": "Day 1(10%), Day 2(10%), Day 3(10%), Day 4(40%), Day 5(30%)",
    "How to Create Screen Name(s)": "Random String",
    "Account Handle(s)": "",
    "Screen Name(s)": "",
    "Account Bio": "",
    "Account Location": "",
    "Account URL": "",
    "Account Creation Date": "2023-08-02",
    "Number of Followers": "10000",
    "Number Following": "100",
    "Number of Languages User Tweets In": "1",
    "% Tweets in Languages": "en(100.00%",
    "Number of Original Tweets/Day": [
        2,
        5
    ],
    "Top Topics": "",
    "Number of Mentions/Tweet": [
        0,
        4
    ],
    "Accounts to Mention": "",
    "Can Other Accounts be Mentioned?": "Yes",
    "Number of Retweets/Day": [
        4,
        10
    ],
    "Number of Quotes/Day": [
        4,
        10
    ],
    "Retweet/Quote Valence": "Mostly Positive",
    "Categories of Accounts this Account Retweets/Quotes": "News (60%); Gov (30%); Health (7%); Other(3%)",
    "Accounts to Retweet/Quote": "",
    "Can Other Accounts be Retweeted/Quoted?": "Yes",
    "Number of Hashtags/Post": [
        0,
        4
    ],
    "Top Hashtags": "",
    "Can Other Hashtags be Used?": "Yes",
    "Top Words": "",
    "Can Other Words Be Used?": "Yes",
    "When Does This Account Tweet (in GMT)?": [
        7,
        20
    ],
    "Percent of Tweets/Retweets that are Positive, Negative, and Neutral Sentiment": "Positive (50%), Negative (25%), Neutral (25%)"
}
```


Carnegie Mellon University

AESOP Outputs

Event Descriptions

USS Carlisle Collision

General Info

Type: Collision/Accident
Which Objects Involved: USS Carlisle, tanker
Who Owns Objects: US, Liberia
Name of Objects: USS Carlisle, Casonee MC
Start Date: 2045-04-02
End Date: 2045-04-02
Other Countries Involved: Liberia, Singapore, United States
Cities:
Other Areas:
Event Leader:
Leader's Job Title: Admiral Johnson
Leader's Home Country: United States
Positive Hashtags:
Negative Hashtags:

Description

On April 1st, 2045, the US Navy warship, USS Carlisle, was involved in a disastrous collision with the Liberian-flagged tanker Casonee MC. The collision happened east of the Strait of Malacca, off the coast of Singapore and Malaysia. The impact caused flooding in nearby compartments, including crew berthing, machinery, and communications rooms. Unfortunately, the collision resulted in the death of ten US Navy sailors.

Upon learning of the incident, The Maritime and Port Authority (MPA) of Singapore quickly initiated a search and rescue operation, which included various agencies from Singapore's Maritime Search and Rescue Region (MSRR). Despite the efforts of these agencies, the casualties of the incident included the ten US Navy personnel.

It is currently unknown exactly what led to the unfortunate crash, however, an investigation is being conducted to determine the specifics of what happened. In the meantime, the families of the ten victims are left mourning their loss. The incident serves as a painful reminder of the dangers of naval operations and the consequences they can bring.

Since the accident, the MPA has recommended for ships to take extra precaution when traversing the area where the collision occurred. The US Navy is also now undertaking a more detailed review of its training and safety protocols in hopes to prevent any further tragedies from taking place.

The USS Carlisle collision was a devastating event, leaving behind damage, both physical and emotional, that will not soon be forgotten. The victims and families affected by the tragedy are in our thoughts and prayers.

Fragmentation Orders

EXERCISE // UNCLASSIFIED // EXERCISE

DEPARTMENT OF THE ARMY
UNITED STATES INDO-PACIFIC COMMAND
CAMP H M SMITH, HAWAII 96861-4028

INDOPACOM TASK ORDER

SUBJECT: Social Media Analysis of Collision Between USS Carlisle and Casonee MC in Strait of Malacca

SUMMARY: This task order seeks to build an understanding of global reactions to the collision between the USS Carlisle and the Casonee MC in the Strait of Malacca, with a focus on relevant social media platforms.

TASKS:

1. Perform comprehensive research into the incident, including an analysis of multiple social media platforms.

2. Develop a detailed timeline of key developments and significant reactions to the accident.

3. Analyze the sentiment of key messages in terms of diverse cultures and regions.

4. Create a list of key players, influencers, organizations, and individuals with the most engagement on the issue.

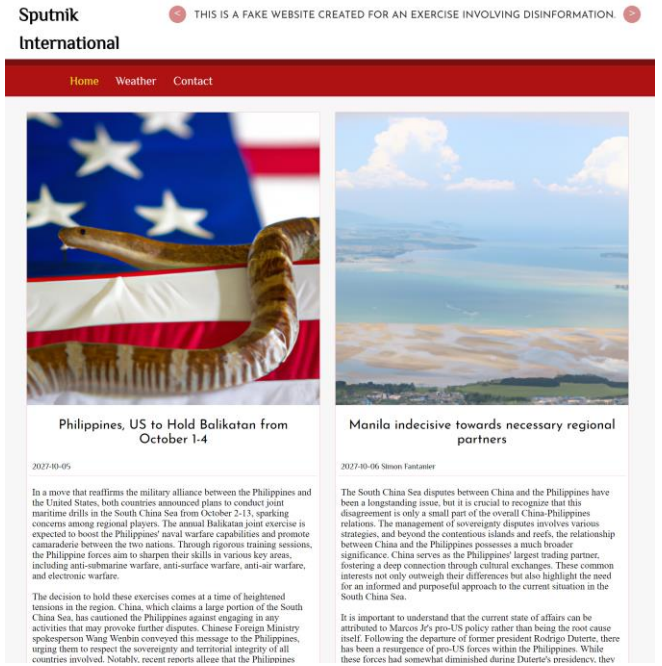
5. Identify key trends, both positive and negative, in the responses from each group.

6. Summarize the responses into a compiled report, including a comparison of regional reactions.

COMMANDER'S GUIDANCE: The results of this analysis should provide a clear understanding of global sentiment surrounding the tragic incident and serve to inform future policies and protocols to ensure maritime safety and reduce the potential for similar accidents in the future.

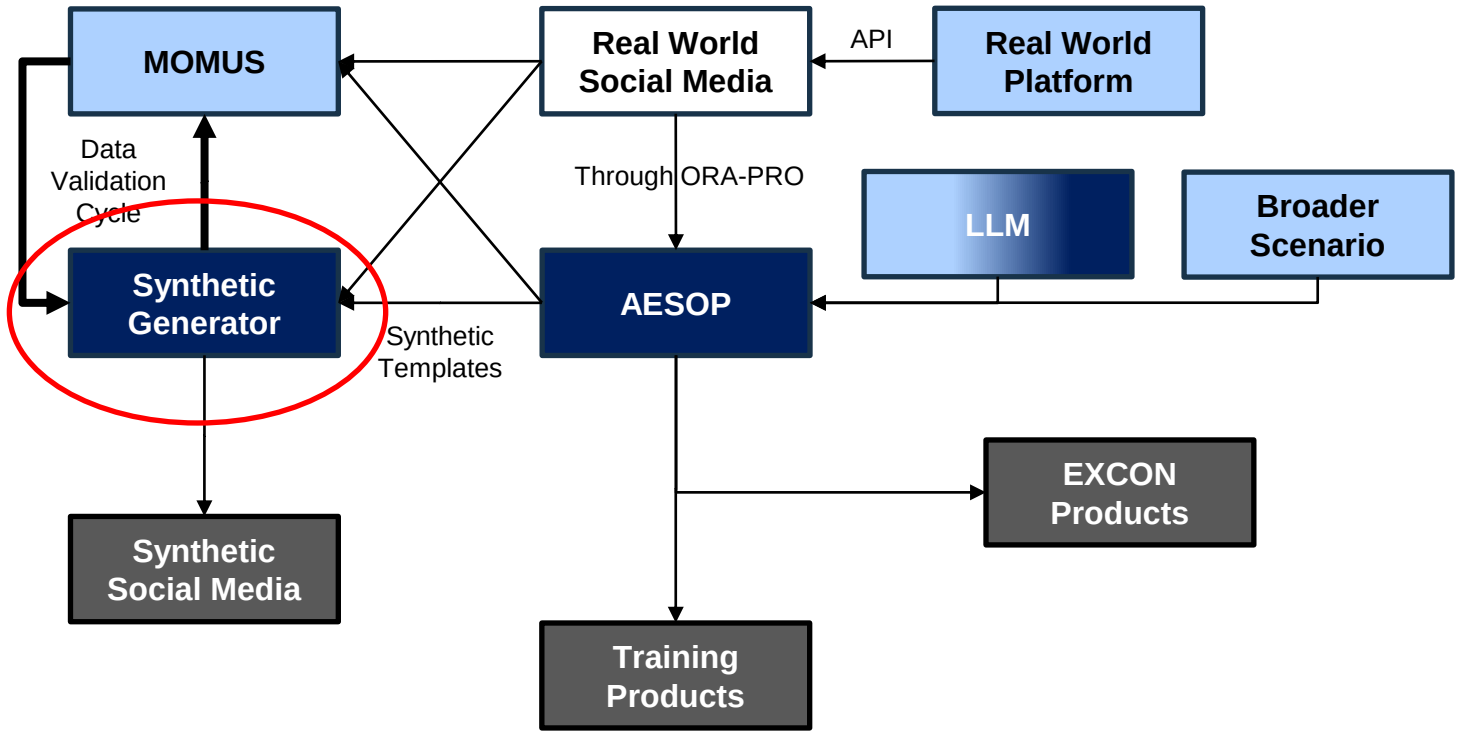
EXERCISE // UNCLASSIFIED // EXERCISE

News Articles



Carnegie Mellon University

Telegram Generation



Two Approaches

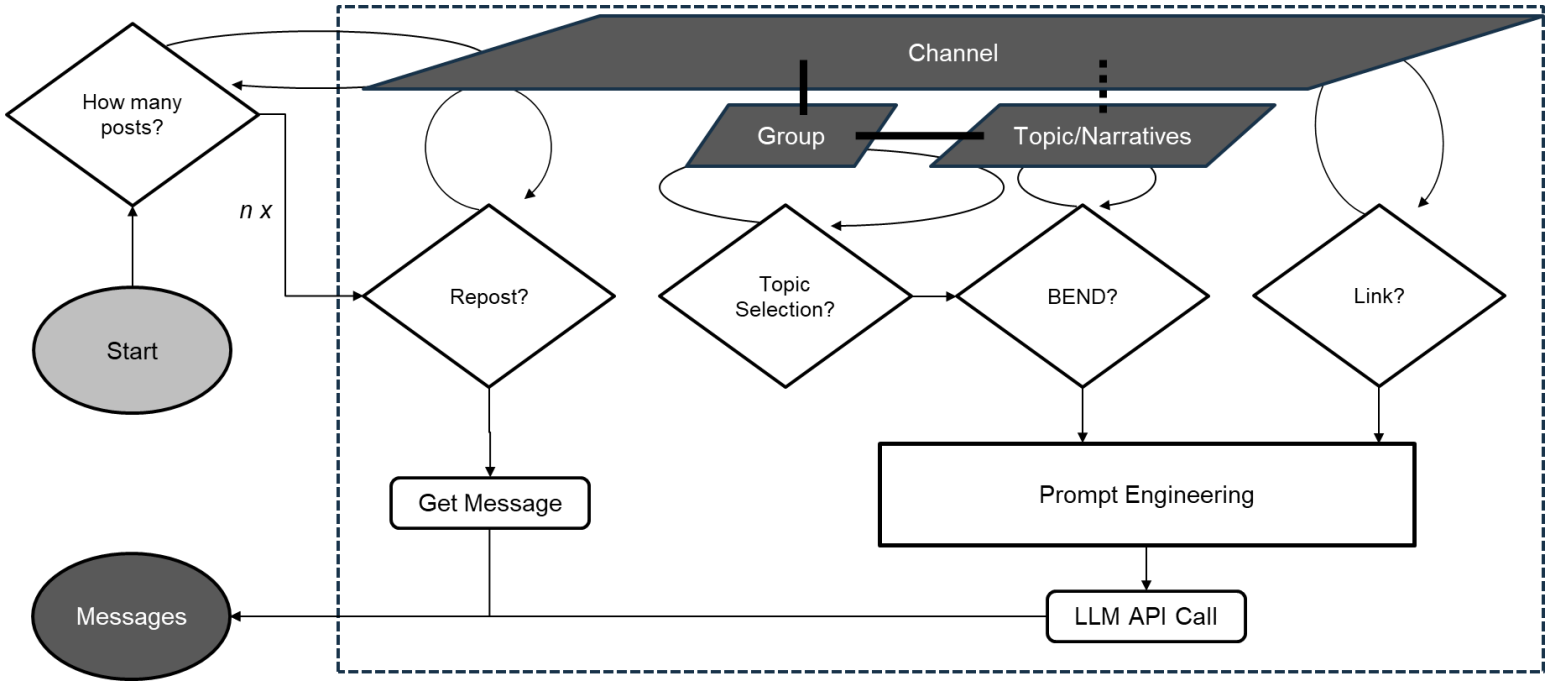
- Top-Down
  - Create desired heterogenous/multimodal network fabric based on real data
  - Fill fabric with appropriate actors, messages, topics that match nodes and link types
- Bottom-up
  - Create detailed social media agents and program agent interaction from first principles
  - Allow social media agents to interact and hope for emergent networks and narratives that are realistic and relevant

Current Telegram generation focuses on the bottom-up approach. Top-down approaches may be more appropriate for other social media.

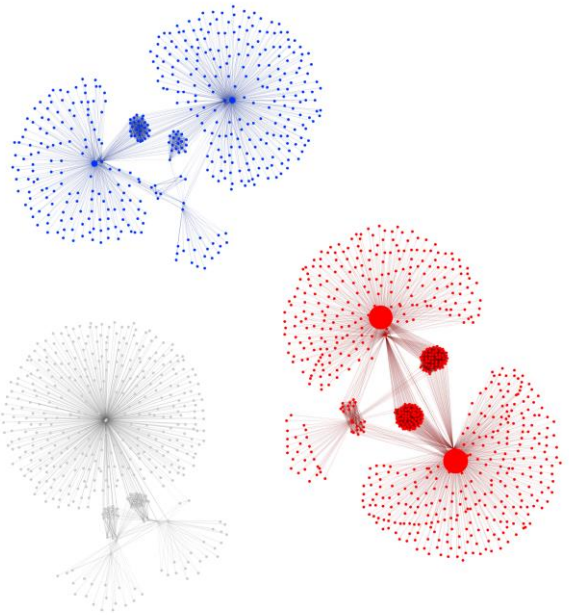
MOMUS is the scoring card for ensuring that synthetic data realistic and relevant.

Telegram Generation

Telegram Generation Flow Diagram



Telegram Channels and Messages



Carnegie Mellon University

Way Forward

Research Roadmap Timeline

		Spring 2024	Summer 2024	Fall 2024	Spring 2025
Doctrinal Synthesis	Doctrinal Survey				
	Overlay Mapping				
BEND Detection	Effects-based				
	Re-run CUE+				
	Countermasure Sim				
	Overall Analysis				
BEND Scenario Development	Synthetic Templates				
	Telegram Generation				
	Twitter/X Generation				
	Facebook Generation				
Final Wrap-up					

Not Scheduled	Work Begun
Nearing Completion	Planned Work

Limitations and Justifications

- BEND Doctrine
  - US Information Operations doctrine is evolving and changing rapidly
  - Information Operations remains a complex issue with authority and titling problems
- BEND Framework Improvements
  - Methods for measuring BEND maneuvers above baseline are required – residual statistics will be more important than net maneuver counts
  - There is currently no way to directly associate observed BEND effects with any single message BEND maneuver
- BEND Scenario Development
  - Without an overarching simulation, training scenario data will be static; however, AESOP could be used to alter the scenario based upon training audience decisions and the templates could then drive additional synthetic data to get after a highly incremented simulation
  - Training data should always be a snapshot of the full picture as most social media APIs do not allow for decisively pulling all data possible

Conclusion

- Methodological contributions
  - BEND effects-based detection, which in conjunction with CUE+ allows for detection for a more comprehensive detection mechanism
  - Scenario extraction process for leveraging existing corpora
- Application contributions
  - US Joint Doctrine/BEND Framework Synthesis
  - AI-enabled scenario development from existing exercise material or corpora
  - AI-enabled Twitter/X, Facebook, and Telegram social media generation for exercise training based on synthetic templates