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Nuclear Deterrence and the Space and Cyber domains

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CROSS-DOMAIN DYNAMICS AND THE EFFECT ON DETERRENCE IN A NUCLEAR ENVIRONMENT



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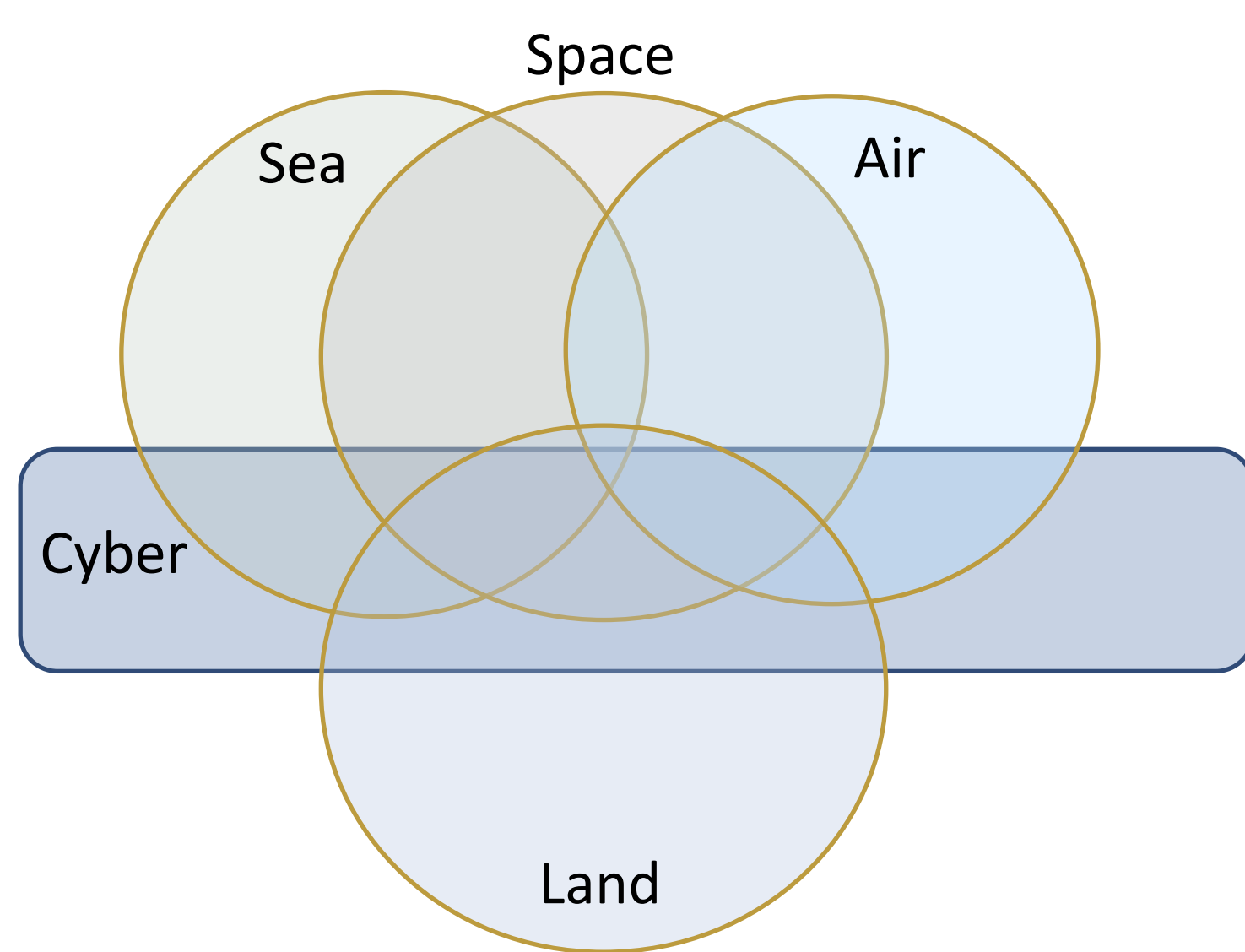
Research Problem: Cyber and Space Domain effects on Nuclear Deterrence

- The Fog of War is thick in the space and cyber domains as it once was in the traditional warfighting domains of air, land, and sea.
- Lack of behavioral norms between nations, especially in the cyber domain, leaves room for miscalculation and misunderstanding.
- Nuclear deterrence requires credibility and transparency to be effective; however, instability and fog introduced from the space and cyber domains may undermine nuclear deterrence effectiveness.



Nuclear deterrence requires credibility, transparency, and robust situational awareness

(Next Generation Missile Early Warning Satellite, courtesy Lockheed Martin)



All domains overlap

Research Questions and Methodology

Students participating in the Space Nuclear Command, Control, and Communications (SNC3) certificate present their findings to the following questions:

- Is US deterrence effective in deterring attacks against the nuclear command and control (NC2) systems via space and cyber vectors?
- What actions in the space or cyber domains would result in an even significant enough to warrant a US kinetic response?
- How can aggression be measured across domains that influence nuclear deterrence?
- What strategies exist to manage and improve deterrence?
- What is the nuclear threshold in the space and cyber domains, if any?

Research Results

- International law, policies, and established norms in other domains such as sea, land, and air add stability, and understanding, and provide clarity to potential adversaries' intentions in those domains, which reduces the likelihood of armed conflict due to misunderstanding or miscalculation.
- Unilaterally, or with allies, the US should endeavor to add systems that will provide situational awareness and visibility in these novel domains.
- The US State Department, with recommendations from appropriate Department of Defense agencies should pursue international agreements to define norms in the space and cyber domains.
- Establishing nuclear redlines in the cyber domain without adequate situational awareness may not be as effective as in other domains therefore the DoD should endeavor to reduce or eliminate NC2 cyber domain dependencies from nuclear command and control.



Robust cross-domain situational awareness is a key component to effective 21st century nuclear deterrence

Recommendations for Further Research

- In the cyber domain, research specific tools and strategies to gain adequate situational awareness of nefarious actions against US Govt and DoD systems.
- In the space domain, explore the feasibility and strategic benefit of transitioning US nuclear command, control, and communications (NC3) to a highly proliferated low earth orbit architecture.

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Technical Report:
Nuclear Deterrence in the Space and Cyber
Domains

