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## Daniel Topa daniel.topa@hii.com

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# 1 Introduction

#### 1.1 Overview of the Problem

This subsection provides a detailed description of the problem or challenge being addressed in this document.

#### 1.2 Objectives

This subsection outlines the main objectives of the document, including key research goals or development targets.

#### 1.3 Methodology

This subsection describes the methodology or approach taken to address the problem and achieve the objectives.

# 2 Backup

# 2.1 A

First subsection.

### 2.2 B

Second subsection.

# 2.3 C

Third subsection.

#### References

- [1] Salvatore Alfano. "Review of conjunction probability methods for short-term encounters (AAS 07-148)". In: Advances in the Astronautical Sciences 127.1 (2007), p. 719.
- [2] Salvatore Alfano. "Satellite conjunction Monte Carlo analysis". In: Advances in Astronautical Sciences 134 (2009), pp. 2007–2024.
- [3] Kyle T Alfriend et al. "Probability of collision error analysis". In: *Space Debris* 1 (1999), pp. 21–35.
- [4] Inc. (AGI) Analytical Graphics. *Iridium 33 Cosmos 2251 Collision*. https://web.archive.org/web/20100514075852/http://www.agi.com/media-center/multimedia/current-events/iridium-33-cosmos-2251-collision/default.aspx. Archived link accessed: 2024-12-25. Includes videos, 3D models, and interactive tools for understanding the event. 2009.
- [5] Anonymous. Analysis of Orbital Debris Impact Risks. Tech. rep. Accessed: 2024-12-25. United States Department of Energy (DOE), Oct. 2009.
- [6] Anonymous. Satellite Collision Modeling with Physics-Based Hydrocodes: Debris Analysis. Tech. rep. Accessed: 2024-12-25. United States Department of Energy (DOE), Aug. 2010.
- [7] Ulpia Elena Botezatu. "Developing a Comprehensive Combat Mindset for Outer Space Security". In: Redefining Community in Intercultural Context 11.1 (2023), pp. 43–52.
- [8] Ken Chan. "Collision probability analyses for earth-orbiting satellites". In: 2001 Flight Mechanics Symposium. Vol. 1. 2001.
- [9] Keir Clarke. Satellite Crash. Vimeo video. A Google Earth Browser plug-in simulation of the Iridium 33 and Cosmos 2251 satellite collision. Accessed: 2024-12-25. 2009.
- [10] Wikipedia contributors. Space Warfare. https://en.wikipedia.org/wiki/Space\_warfare. Accessed: 2024-12-25. 2024.
- [11] James Lee Foster and Herbert S Estes. A parametric analysis of orbital debris collision probability and maneuver rate for space vehicles. NASA, National Aeronautics and Space Administration, Lyndon B. Johnson Space Center, 1992.
- [12] Adam P Jodice and Mark R Guerber. "Space Combat Capability... Do We Have It?" In: Air & Space Power Journal 28.6 (2014), pp. 82–99.
- [13] Donald J Kessler and Burton G Cour-Palais. "Collision frequency of artificial satellites: The creation of a debris belt". In: *Journal of Geophysical Research: Space Physics* 83.A6 (1978), pp. 2637–2646.
- [14] Jean-Luc Lefebvre. "Combat within Space?" In: *Space Strategy*. First published: March 17, 2017. Explores strategic analysis of combat in orbit and key orbital locations. Springer, 2017. Chap. 1, pp. 1–20. DOI: 10.1007/978-3-319-47313-5\_1.
- [15] Jer-Chyi Liou and Debi Shoots. Orbital Debris Quarterly News, Volume 13, Issue 4. Tech. rep. 2009.

- [16] Michael Listner. Iridium 33 and Cosmos 2251 Three Years Later: Where Are We Now? https://www.thespacereview.com/article/2023/1. Accessed: 2024-12-25. Analysis of the long-term effects and current status of debris from the 2009 satellite collision. 2012.
- [17] Martha Mejía-Kaiser. "Collision Course: The 2009 Iridium-Cosmos Crash". In: Proceedings of the 52nd IISL Colloquium on the Law of Outer Space. Posted: March 21, 2019. Accessed: 2024-12-25. Examines legal, political, and liability implications of the 2009 satellite collision. International Institute of Space Law. Daejeon, Korea, Oct. 2009, pp. 87–118.
- [18] Leos Mervart. Methods of Celestial Mechanics. Springer, 2005.
- [19] Joseph Peter Morris. Analysis of Smoothed Particle Hydrodynamics with Applications. Monash University Australia, 1996.
- [20] Scot Olivier et al. *High-performance computer modeling of the Cosmos-Iridium collision*. Tech. rep. Lawrence Livermore National Lab. (LLNL), Livermore, CA (United States), 2009.
- [21] Alex T Pang, Craig M Wittenbrink, and Suresh K Lodha. "Approaches to uncertainty visualization". In: *The Visual Computer* 13.8 (1997), pp. 370–390.
- [22] Valerio Pascucci and Randall J Frank. "Global static indexing for real-time exploration of very large regular grids". In: *Proceedings of the 2001 ACM/IEEE Conference on Supercomputing*. 2001, pp. 2–2.
- [23] P. K. Seidelmann. "1980 IAU theory of nutation: The final report of the IAU working group on nutation". In: *Celestial Mechanics* 27.1 (1982), pp. 79–106.
- [24] Patrick Seitzer et al. "Optical studies of space debris at GEO-survey and follow-up with two telescopes". In: 8th Air Force Maui Optical and Supercomputing (AMOS) Technical Conf. Wailea, Maui, Hawaii, USA. 2007, pp. 10–14.
- [25] Mark F Storz, Bruce R Bowman, and Major James I Branson. "Space Battlelab's High Accuracy Satellite Drag Model". In: Air Force Space Command, Space Analysis Center (ASAC), Peterson AFB. Presented at the AIAAA Astrodynamics Specialist Conference and Exhibit, August. Vol. 5. Citeseer. 2001.
- [26] CelesTrak Team. Iridium 33/Cosmos 2251 Collision. urlhttp://celestrak.com/events/collision.asp. Coverage started March 5, 2009. Updated March 11, 2009. Accessed: 2024-12-25. 2009.
- [27] Edward B Tomme. The Paradigm Shift to Effects-Based Space: Near-Space as a Combat Space Effects Enabler. Airpower Research Institute, College of Aerospace Doctrine, Research and Education, 2005.
- [28] Brian Weeden. 2009 Iridium-Cosmos Collision Fact Sheet. Accessed: 2024-12-25. Nov. 2010.
- [29] David Wright. Colliding Satellites: Consequences and Implications. Union of Concerned Scientists Report. Accessed: 2024-12-25. Feb. 2009.