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Ocean data vulnerability to cyber manipulation and consequences for infrastructural resilience

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Abstract

Document Sections

- I. Introduction
- II. Ocean Data and Disaster Preparedness
- III. Vulnerability of Data Buoys to Spoofing and Cyber Manipulation
- IV. Hollywood to Honolulu: Cascading Effects and Terrestrial Sequelae of Spoofing Ocean Data
- V. Securing Data Buoy Networks

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Figures

References

Keywords

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Footnotes

Abstract:

In this paper, we consider potential vulnerabilities of critical infrastructural resilience to cyber manipulation, in particular the ability to counterfeit or spoof data from tsunametric buoys and other ocean data acquisition systems equipped with telecommunications capability, and connected to the Internet of Things. Employing a historical hindcasting methodology, we briefly trace the history of ocean data acquisition systems in the context of tsunami detection and disaster preparedness, and describe the basic techniques through which this digital sensor equipment could be manipulated. We go on to explore the potential on-land sequelae of such manipulation, thus establishing the importance of secure data buoy communications. In particular, we present the possibility that spoofing or manipulating ocean buoy data has the potential to compromise essential services such as the generation, transmission, and distribution of electricity on land. In order to mitigate such a potential vulnerability, or blind spot, we offer pathways for increasing the security of ocean data acquisition systems, and thereby enhancing resilience within the many additional maritime and terrestrial systems which either rely on, or are impacted by sea-state data.

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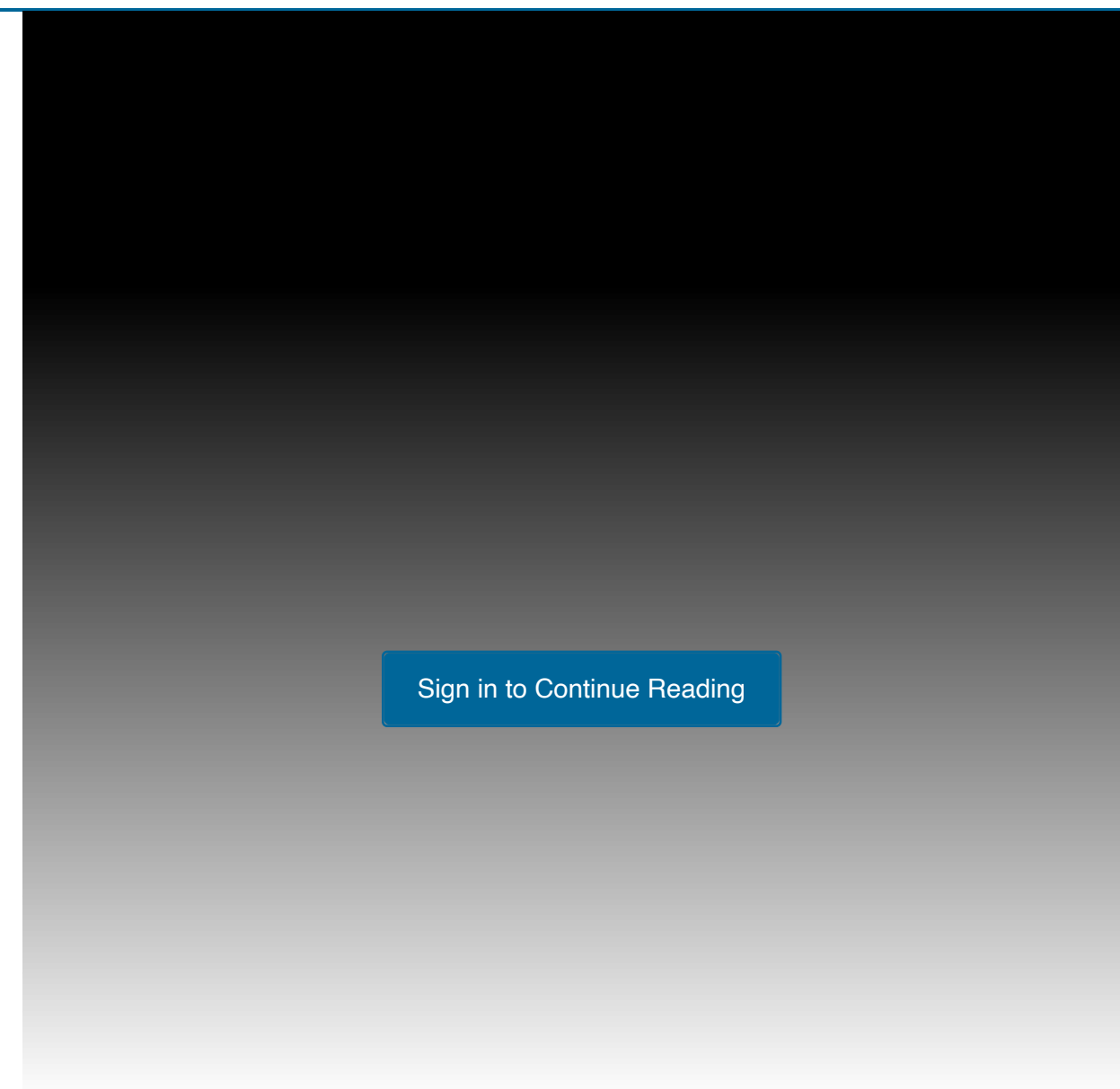
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