

Anti-Blackbeard AI:

An Analysis of the AI Defending Cargo Ships Against Modern Maritime Pirates

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ABSTRACT

- ❖ 1714-1718: Golden Age of Piracy in the Caribbean
 - Blackbeard, Black Sam
- ❖ Maritime piracy now affects the shipping industry
 - Wreaking havoc on international trade routes
- ❖ These modern pirates often hijack cargo vessels from fishing boats
 - Often escape detection
 - Generally attack between 12-6 a.m.
 - Human sentries cannot see through fog and dark
- ❖ Roughly 4 years ago, shipping companies started integrating AI into vessel security
 - So far, many successes
 - But still improvements to be made

2023 Piracy Map



Commercial Crime Services (2023). IMB Piracy & Armed Robbery Map 2023 [Digital interactive map]. Retrieved from <https://www.icc-ccs.org/index.php/piracy-reporting-centre/live-piracy-map/piracy-map-2023-1>

AI ONBOARD MERCHANT SHIPS

- ❖ AI identifies suspicious behavior
 - Vessel making sudden movements
 - High speeds
 - Steering around cargo ship
- ❖ It is important to not cause false alarms
 - Do not want to mistake a buoy or legitimate fishing boat for a pirate vessel

Windward vs. The NATALIA

- ❖ Windward's AI alerted that the NATALIA had become a pirated ship
- ❖ The signs that lead to this alert:
 - Flag change mid-trip from one high-risk country to another
 - Suspicious loitering
- ❖ Windward notified authorities
- ❖ Resulted in \$470 million illegal drug bust

AI in Salty Skies: UAV's

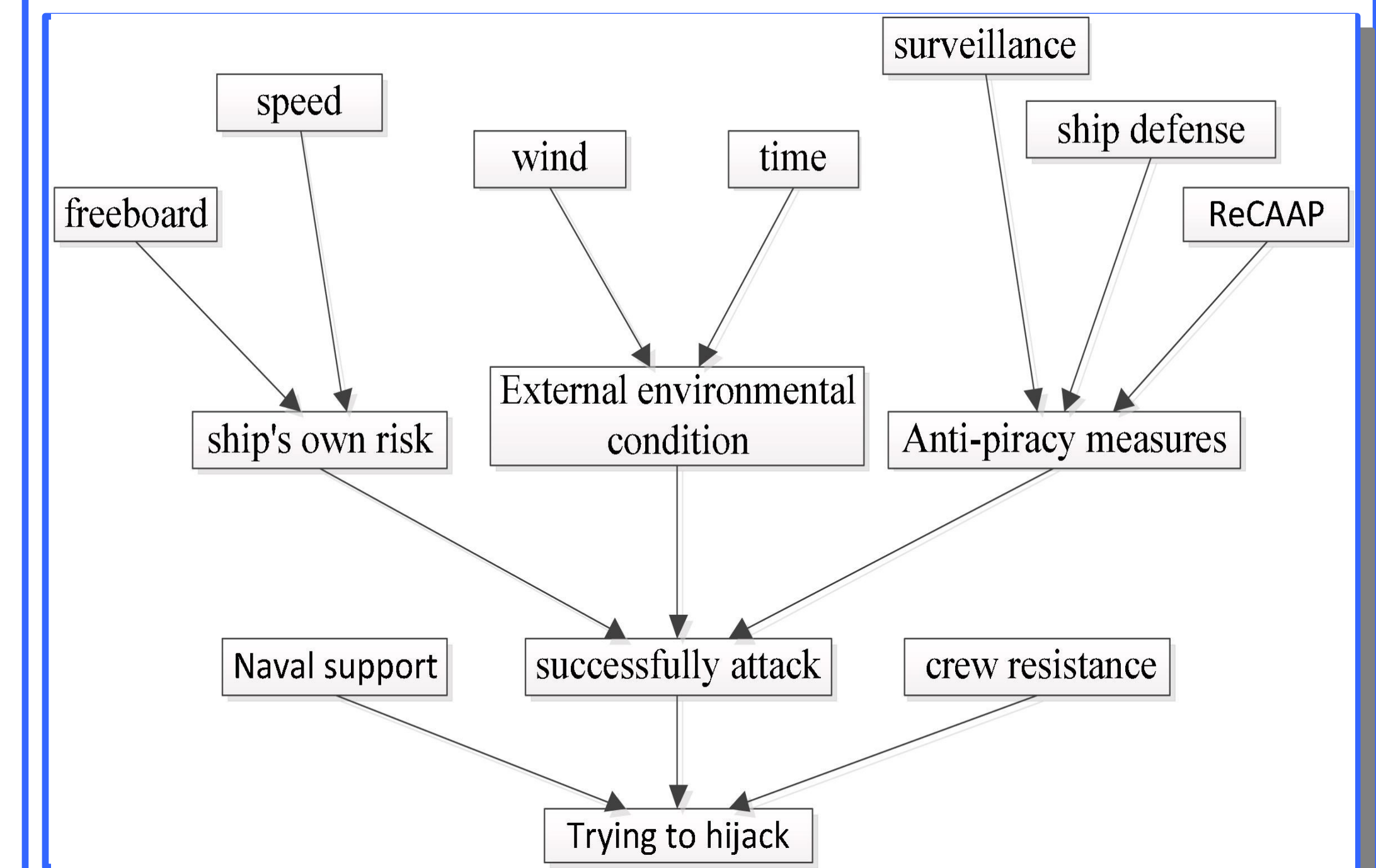
- ❖ UAV: Unmanned Aerial Vehicles
- ❖ Basically AI-flown planes
- ❖ Identify & track pirates from the skies
- ❖ Provides warning of pirate vessel to cargo ship crew



Manarache, M. (2021, August 9). Schiebel CAMCOPTER S-100 Successfully Completes Flight Trials For U.S. Navy's ONR [Digital Image]. Naval News. <https://www.navalnews.com/naval-news/2021/08/schiebel-camcopter-s-100-successfully-completes-flight-trials-for-u-s-navys-onr/> Conference Name: ACM Woodstock conference

BAYESIAN NETWORKS

- ❖ Scientists have begun experimenting with newer AI models & algorithms to apply to thwarting piracy
- ❖ Bayesian Networks can capture causal relationships
 - Determines what characteristics of a cargo vessel make it most vulnerable to pirate hijackings
 - Ship type
 - Environmental conditions
 - Location of ship



Jiang, M., & Lu, J. (2020). The analysis of maritime piracy occurred in Southeast Asia by using Bayesian Network. Transportation Research Part E: Logistics and Transportation Review, 139, 101965. <https://doi.org/10.1016/j.trre.2020.101965>

FUTURE IMPROVEMENTS

- ❖ AI triggers an alert that pirates are nearby
- ❖ But future developments include active responses
 - Flashing lights
 - Warning sirens
 - Activating vessel's defensive mechanisms

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